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XVIII Congreso de la SEOR

Valencia, 4-6 de junio de 2015

Centro de Eventos Feria Valencia

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Gretting from the President of the SEOR and from the President of the Scientific Committee

Estimadas/os compañeras/os:

Próximamente, el 4-6 de junio de 2015 se celebrará en Valencia el XVIII Congreso de la Sociedad Española de Oncología Radioterápica. Es la oportunidad que tenemos los oncólogos radioterápicos españoles cada dos años de reunirnos e intercambiar información y por qué no, incluso iniciar proyectos comunes de investigación tras los resultados presentados.

Nuestra especialidad está logrando cada vez mayor presencia en la sociedad, e intentamos que nuestro peso, donde se toman las decisiones, sea cada vez mayor. Pero esto no es suficiente para revindicar la importancia de la Oncología Radioterápica en el tratamiento del cáncer.

La contribución que realizamos de forma continua a la curación y cuidado de los pacientes, tiene que verse reflejada en nuestra actividad científica. Por ello, qué mejor manera de mostrar esta actividad a nuestros compañeros y a la sociedad, que comunicarla en el Congreso de la Sociedad, antes de presentarla en reuniones internacionales o plasmarla en revistas de prestigio.

En toda reunión se intenta incorporar algo nuevo y la nuestra será dar un mayor protagonismo a los grupos de trabajo en la elaboración del programa científico y además, incorporar un nuevo formato en cada sesión, analizando primero la evidencia científica sobre el tema que se trate, segundo mirar hacia dónde vamos y finalizar con la presentación de las mejores comunicaciones sobre el objeto de la sesión.

Sin embargo vuestra participación y asistencia es lo más importante para que el congreso sea un éxito. La calidad de vuestras presentaciones, comunicaciones o posters, es lo que tendrá trascendencia y toda nuestra labor lo único que pretende es que el conjunto de la reunión funcione como una buena orquesta y que nadie desafine.

Esperamos que todo estos cambios, junto con la buena acogida que habitualmente os damos cuando venís a Valencia, os anime a participar o asistir al XVIII Congreso de la Sociedad Española de Oncología Radioterápica y por ello os animo a que comencéis ya a preparar las comunicaciones o poster para Valencia.

Dr. José López Torrecilla
Servicio de Oncología Radioterápica - ERESA, Hospital General

Gretting from the President of the Organizing Committee

Queridos amigos y compañeros:

En nombre del Comité Organizador y en el mío propio, tengo el honor de invitaros al XVIII Congreso Nacional de la Sociedad Española de Oncología Radioterápica (SEOR) que se celebrará en Valencia del 4 al 6 de junio de 2015.

Las nuevas tecnologías como linkedin, correos electrónicos, *whatsapp*, etc. están revolucionando nuestra forma de comunicarnos. Ya no hay que esperar al congreso nacional e internacional, para conocer el último adelanto o cambio en el manejo de nuestros tratamientos contra el cáncer. Cualquier novedad es rápidamente difundida por estas nuevas autopistas de la comunicación, llegando en pocos minutos a nuestros terminales de ordenador, móviles, etc. No solo llega la voz sino también vemos la imagen. De ahí que en los congresos o reuniones científicas tenemos que conseguir un "valor añadido".

El lema del congreso *"Oncología Radioterápica: Tratamiento preciso y personalizado contra el cáncer"* nos transmite la idea de tener que compaginar la tecnología propia de la radiación junto con conocimientos de la biología molecular, la cinética celular, los mecanismos de acción e interacciones farmacológicas de las radiaciones con las nuevas dianas moleculares, estar familiarizado con los tratamientos sintomáticos, así como mucho sentido común. Nuestro objetivo es conseguir el máximo beneficio para los pacientes con nuestros tratamientos basados tanto en radiaciones como en fármacos.

En este congreso se pretende dar protagonismo a los grupos de trabajo que desde hace años están funcionado en nuestra Sociedad Oncológica, emulando la frase atribuida a Guiseppe Tomasi de Lampedusa, *"Si queremos que todo siga igual, es preciso que todo cambie"*. Hemos creado nuevos espacios para resaltar las publicaciones y labor de investigación de los oncólogos radioterapeutas. Se ha decidido comprimir la duración del congreso a tres días, incluyendo el sábado, en un intento de compatibilizar en estos tiempos difíciles, las obligaciones laborables con la mayor presencia de congresistas posible. Por lo que os esperamos a casi todos.

En la organización de este congreso hemos participado la mayor parte de los servicios de la Comunidad Valenciana, intentando transmitir un "carácter mediterráneo" esperamos aportar un aire fresco, comunicativo y aglutinador con el fin de conseguir un ambiente distendido, donde poder alcanzar un nivel óptimo de comunicación de experiencias que nos enriquezcan al máximo en lo profesional. Si además conseguimos aumentar los lazos de amistad entre nosotros, nuestro objetivo estará doblemente cumplido.

Nos gustaría que en Valencia se una al buen clima de la proximidad del solsticio de verano, la experiencia aportada por los diferentes grupos, las nuevas propuestas científicas de tratamientos y poder divulgar y discutir las diferentes técnicas utilizadas por los distintos servicios.

Recibid nuestra más calurosa bienvenida
Dr. Leoncio Arribas Alpuente

Clin Transl Oncol (2015) [Extraord. 1] 17:1-29

CONFERENCES

Thursday, june 4

10:30-12:30

CENTRAL NERVOUS SYSTEM TUMORS

PRIMARY CNS TUMORS RADIOSURGERY INDICATIONS

AMENDOLA, B.

Innovate Cancer Institute. Miami, EE.UU.

Gliomas are one of the most common primary brain tumors, affecting approximately 6 per 100,000 person-years in the United States. Low grade astrocytomas (LGA) are slow-growing primary brain tumors with a heterogeneous clinical behavior. Because of the nature of these tumors the management remains controversial. The approach is filled with discrepancies ranging from early and extensive surgery versus "wait-and-see", immediate postoperative radiation versus at the time of progression.

Classification of gliomas

— WHO grade 1: Pilocytic astrocytoma.
— WHO grade 2: Diffuse astrocytoma, oligoastrocytoma,oligodendroglioma.
— WHO grade 3: Anaplastic astrocytoma, anaplastic oligoastrocytoma, anaplastic oligodendroglioma.
— WHO grade 4: Glioblastoma multiforme.

Conventional MRI is the most effective imaging modality in the work-up of CNS tumors.

The general prognostic factors for all types of gliomas are: age, histological subtype, and Karnofsky Performance Score (KPS). Radiation therapy may be recommended in three circumstances:

— Radiation can be given after surgery for residual disease. The effectiveness of immediate radiation therapy after surgery is unclear. Because the benefit is uncertain and radiation has the potential for long-term neurologic side effects, postoperative radiation is often not recommended.
— Radiation therapy may be the preferred treatment when a low-grade glioma has been diagnosed in a critical area of the brain that cannot be surgically removed, and therapy is felt to be necessary.
— Radiosurgery is an emergent modality of treatment that can be used either for cure, retreatment or salvage after conventional radiation.

Brainstem glioma

Most prevalent in children, brainstem gliomas are a heterogeneous group of tumors. Treatment generally involves radiation. Exophytic medullary glioma and tectal gliomas are more indolent forms of brainstem gliomas with better prognoses and may be managed conservatively with serial imaging and clinical evaluation.

Pilocytic astrocytomas are low grade, indolent, cystic tumors that represent 5%-6% of all gliomas. Genetic abnormalities are common. Treatment is surgery alone. Subependymal giant cell astrocytomas are benign, indolent, well-circumscribed, and often calcified tumors, generally arising from the wall of the lateral ventricles.

Radiosurgery: Stereotactic radiosurgery is considered a potential adjuvant to surgery in primary tumors. Lars Leksell, pioneer of stereotactic radiosurgery (SRS), defined this option as "a technique of intact skull destruction of an intracranial target using single-fraction ionizing radiation with stereotactic guidance". In contrast with less accurate radiotherapy techniques, SRS has the capacity of optimizing dose to the target while minimizing dose to surrounding critical structures. Those characteristics led SRS to be considered not only as a potentially adjuvant to surgical treatment but in many cases as an alternative primary option. SRS has been used either as a salvage therapy for recurrent disease or as a boost to fractionated postoperative in newly diagnosed tumors. For low grade gliomas (WHO grade I and II), SRS seems to achieve tumor response in many cases, but its long-term efficacy remains unclear given the favorable prognosis of the disease of many of these patients. Primary, adjuvant or salvage SRS is becoming more appealing and has emerged in the last decade as the most commonly viable strategy for recurrent and primary brain tumors.

ROLE OF CRANIAL RADIOTHERAPY, RADIOSURGERY AND SYSTEMIC TREATMENT

RADES, D.

University Hospital Schleswig-Holstein. Alemania

About 60% of patients with brain metastases have multiple (≥4) lesions. Most of the patients are treated with whole-brain radiotherapy (WBRT) alone. Due to the often poor survival times, the overall treatment time should be as short as responsible. A short course of WBRT with 5×4 Gy in 1 week is as effective as longer regimens such as 10×3 Gy in 2 weeks or 20×2 Gy in 4 weeks in many patients. Patients with expected survival times of >6 months could benefit from longer-course WBRT with total doses of >30 Gy and doses per fraction of <3 Gy in terms of improved treatment results and less neurocognitive deficits. The risk of neurocognitive decline can be further reduced with hippocampus sparing techniques. Since selection of the WBRT regimen should consider a patient's remaining life time, survival scores are important, which are available for several tumor types. Selected patients with a favorable survival prognosis may benefit from additional systemic treatment. However, until now the addition of systemic agents to WBRT has mostly failed to improve the survival of patients with multiple brain metastases.

Patients with a limited number (1-3) of brain metastases have a far better survival prognosis than patients with multiple metastases. Many of these patients benefit from more intensive treatments such as resection, radiosurgery (RS) and fractionated stereotactic radiation therapy (FSRT). RS plus/minus WBRT leads to better control of the treated lesions, control within the entire brain and survival than WBRT alone. The combination of RS and WBRT results in better control of both the treated lesions and the entire brain but not in significantly better survival. In a small randomized trial, neurocognitive function was worse after RS + WBRT than after RS alone at 4 months. Therefore, many physicians hesitate to add WBRT to RS. However, the randomized trial did not investigate neurocognitive function at 1 year, when RS + WBRT resulted in significantly better intracerebral control than RS alone. This is important, since an intracerebral recurrence is the most important cause of neurocognitive deficits after treatment of brain metastases. Thus, additional prospective trials are required to properly define the addition of WBRT to RS.

NEUROIMAGING FOLLOW-UP FOR RESPONSE AND COMPLICATIONS AFTER RADIOSURGERY TREATMENT IN TUMORS OF THE CENTRAL NERVOUS SYSTEM

MARTINEZ MORENO, N.

Hospital Ruber Internacional. Madrid

The follow-up of patients treated with Radiosurgery (RS) for tumors or other pathologies at the Central Nervous System (CNS) is performed by imaging. Magnetic Resonance Imaging (MRI) remains the test of choice and is the technique usually used. T1-weighted sequences, including gadolinium postcontrast sequences, and T2-weighted sequences are employed in the usual studies. Treatment response was assessed based on the pattern of contrast enhancement.

The radiotherapy used today with special techniques in which the doses are increased significantly in the target, healthy parenchyma and other surrounding organs of risk and the simultaneous or sequential use of chemotherapy, antiangiogenic... has involved a change in the patterns of contrast enhancement.

Sometimes, the increased contrast enhancement area can lead us to the diagnosis of lesion growth. If these appear heterogeneous enhancement areas, changes in T2-weighted images or other alterations, we could consider the presence of radiation necrosis. In late changes in which the primary tumor was benign or low-grade, we will even consider a phenomenon of radiation-induced carcinogenesis.

When the contrast enhancement area decreases, it is considered a good response to treatment.

Regardless of the degree of enhancement, the presence in T2-weighted sequences of hyperintense areas in the perilesional parenchyma suggestive of damage probably related to edema is also common.

Nowadays, we know that these changes are not what they seem. Inflammation phenomena, edema, and alteration in the blood brain barrier caused by various treatments can result in an alteration in the contrast enhancement pattern mimics an increase in tumor size. This "tumor growth" can be stabilized, and even decreased without any treatment, because it is only the alteration in contrast enhancement when in reality the tumor is responding to treatment (pseudoprogression). In fact, some studies associate pseudoprogression with best prognosis, indicating that it may be due to inflammatory phenomena produced by the response to treatment.

Similarly, the decrease in contrast enhancement in certain circumstances (i.e. the use of anti-angiogenic drugs) can simulate a tumor regression. If this image is evaluated with certain sequences of MRI, as FLAIR sequences (Fluid attenuation inversion recovery) may correspond to a clear increase in the tumor (pseudoresponse).

The appearance of hyperintense areas on T2-weighted sequences, classically were interpreted as edema. These changes are not always symptomatic, most of them resolve spontaneously and are known today as radiation-induced imaging changes (RIIC). Sometimes, these images may appear months later after treatment and may be due really to edema secondary to ischemic vascular transudate phenomena that can eventually lead even to necrosis.

Correct knowledge and correct use of current imaging techniques is necessary. The use of RMI (classical T1-weighted sequences, with and without gadolinium contrast, and T2-weighted images combined with new diffusion and perfusion studies) have to be completed with the techniques of molecular imaging. The changes described, if have not clinical impact, as usually, do not require treatment. Clinical decisions are based on correct diagnosis. Without this properly diagnosis, therapeutic approaches cannot provide solutions, but could worsen patient's status with unnecessary surgery or changing treatment lines that were proving really effective.

We need a long-term follow-up for these patients, you could say that for life, even in cases of benign tumors or vascular or functional disorders. There is still much research on the long-term outcome and the imaging changes after these treatments.

NEW TECHNOLOGIES IN THE SURGICAL TREATMENT OF MALINANT GLIOMAS: FLUORESCENCE (5-ALA) GUIDED RESECTION

ARRAEZ SANCHEZ, M.A.

Regional University Hospital Carlos Haya. Málaga

Malignant glial tumors are infiltrating lesions with poor outcome in spite of multimodality treatments. One of the difficulties in the surgical treatment arises from the impossibility to define the tumoral margin. This aspect is really important, as complete resection improves survival. This paper deals with the fluorescence-guided (5-ALA) resection as adjuvant method to improve resection and survival in malignat glioma, discussing also the role of intraoperative MRI, ultrasonography and neuronavigation.

The management of high grade gliomas (anaplastic astrocytoma and glioblastoma multiforme, grades III and IV of WHO) includes the surgical treatment, radiation therapy and chemotherapy. In spite of this, the average life expectancy is poor usually no longer than 15 months. The role of the surgical resection has been reinforced as it includes the area of tumor enhancement in MRI (higher cellular density) and it has been demonstrated that the efficiency of concomitant radio-chemotherapy is greater when a complete resection of the tumor (contrast enhancement ring) has been performed. It is not difficult to understand the complete tumor resection is achieved in less than 30% of the cases due mainly to difficulty to define the tumoral margin (interphase between healthy and pathological tissue. In accordance to that, a number of different strategies have been used to define this margin and increase tumor removal and therefore improve survival time, of course without increasing morbidity. Intraoperative MRI has a limited use due to the high costs and inconvenient location in the operating room, in spite of its benefits. Intraoperative ecography is very useful for surgery planification, however its capacity to create a well-defined tumor interphase is low. For his reason, it has a limited use to increase the level of tumor resection safely. Neuronavigation is a very useful tool for preoperative planification, but the brain shifting is a clear disadvantage. This is the context in which 5-ALA induced fluorescence tumor resection appears, trying to help to define intraoperatively the tumoral margin. Although some other lesions can cause fluorescent phenomenon in the nervous system such as abscesses, metastasis, lymphomas, necrotizing vasculitis, meningiomas with atypical cells and gliosarcomas, malignant glial cells constantly show this phenomenon.

5-ALA (5 aminolevulinic acid) is metabolized by cells in high grade gliomas. The 5-ALA is metabolized into IX protoporfirine, which is a fluorosphore. Glial malignant cells have a demonstrated affinity for this substance that is incorporated by PEPT2 transporter and posteriorly is metabolized to fluorescent porfirines that allow to visualize the pathological tissue. This physical phenomenon is being also used in photodynamic detection and treatment techniques for neoplastic treatment although the therapeutic application for malignant glial tumors is still experimental.

The administration of the 5-ALA is done 6 hours before surgery orally. Its activity longs for several hours. The suggested dose is 50 mg/kg. It is also important the administration of

dexamethasone (4 mg/8 h) the days before surgery, as the 5-ALA crosses the altered brain-blood barrier and can carry a false positive fluorescent phenomenon due to perilesional edema. The surgical microscopes must be adapted to emit some special way-length light that is re-emitted and filtered. The normal brain is seen in dark blue and the tumor is seen in intense red color. It is important to mention that the intensity of the fluorescence is variable and related to the proportion of abnormal cells. The necrotic areas will not be seen positive, as the proportion of cells is very low. In the same way, the peripheral areas are going to be seen light red. As it can be the correspondent with the infiltration component of the tumors, the resection of this component of the lesion can produce postoperative deficit when carried out near eloquent cortex. In these cases, the addition of techniques of intraoperative cortical mapping are mandatory. Intraoperative MRI is also very useful to define the tumoral margin, but the cost/benefit ratio is less favorable. Ultrasonography has not been proven to be useful in that regard.

It is important to ascertain whether this intraoperative technology has a positive impact in survival. Stummer et al (have demonstrated that the use of 5-ALA improves de degree of tumor resection (36% vs. 65%) increasing de percentage of patients disease-free 6 months after surgery (21.1% with conventional surgery, 41.0% in 5 ALA guided surgery), without higher postoperative morbidity rates due to a more aggressive resection. This improvement of survival has also been proved by Pichlmeier et al. analizing 243 glioblastoma multiforme). Fluorescent guided resection has been tested in several other prospective randomized multicentric trials demonstrating its efficacy (increased tumor resection accompanied by longer disease-free survival statistically significant) and its safety. For this reason, the European Medicines Agency has approved its use for adult malignant glial tumor resection.

The fluorescence guided resection (5-ALA) must be considered a non invasive method to define the tumoral margin intraoperatively that improves resection and survival in malignant glioma surgery without adding morbidity.

10:30-12:30
UNIVERSITY

POSSIBILITIES FOR THE TEACHING OF RADIATION ONCOLOGY

BILBAO ZULAICA, P.

University Hospital Cruces. Vizcaya

The current legal framework of the Knowledge Areas approved by the University at National level, and their grouping in different university departments exposed, and comparing with current medical specialties recognized by the Ministry of Education and Ministry of Health.

On the other hand, it is reported from different appropriations in the curriculum of each university, approved by ANECA (National Agency for Quality Assessment and Accreditation) and its publication in the Official Gazette, with a minimum duration for modification 6 years since its publication.

The curriculum of the Faculty of Medicine and Dentistry, University of the Basque Country/EHU, commenting on courses that are taught, the subject taught, the distribution of program content and the means used are exposed to teaching; lecture, seminar, classroom practices, clinics and practices Rotarian students. As the evaluation system.

It ends with a review of international views on who should learn medical student during their training level Degree in Radiation Oncology, and the rapid change of guides clinics of different tumors performance, ease of access to them, challenging part of the work to develop in the future roadmap tumors committees Hospitals cornerstone of quality treatment for each patient.

CURRENT SITUATION OF THE TEACHING OF RADIATION ONCOLOGY IN THE DREGREE OF MEDICINE IN SPANISH UNIVERSITIES. GREAT DIFFERENCES AND HETEROGENEITY

ARENAS PRAT, M.

Hospital Reus's Sant Joan. Tarragona

The Radiation Oncology is one of four medical specialties included within the area of knowledge of Radiology and Physical Medicine. It is a mixed specialty with nosological and technological content and with close ties to the Radiology, Nuclear Medicine, Radiation Physics, the Radiobiology, the Radiation Protection and Medical Oncology. Radiotherapy planning heavily relies on the Diagnostic Imaging (CT, MRI and PET) and chemoradiation treatments in Medical Oncology. The importance of his presence in the Faculty of Medicine Degree Plan is justified by the high number of therapeutic indications. A minimum of 50% of cancer patients will require at some point in their evolution of external beam radiation therapy and/or brachytherapy, which means that one in every 5-6 people will require the same throughout his life.

We analyzed 39 Spanish universities about certain aspects related to the teaching of our specialty. Information has been obtained by mail or telephone contact.

One of the aspects analyzed is in relation to the teaching load imparted by specialists in Radiation Oncology, although we are aware that there are professors at universities in other disciplines who teach our specialty. In universities with various instructional units have made the average of the same.

The median of hours of lectures is 12 (0-36), and the median of seminars is 4 hours (0-22) and the median of practices is 11 hours (0-38). These are the hours that students receive throughout their training. Other questions are related to the subjects taught.

On the other hand, we wanted to know the number of people of the different teacher's category. In Spain exists three degree, called associate professors, "titular" professors and "catedráticos" (the maximum dregree of teacher in Spain), who are Radiation Oncology specialists. In our universities there are 66 associate professors, 12 "titular" professors and 6 "catedráticos". All of them are Radiation Oncology specialists.

We'll present the study results in the SEOR congress. They show great heterogeneity in different Spanish universities.

16:30-18:30
CANCER CONTINUING CARE

STATE OF THE ART TREATMENT OF SPINAL CORD COMPRESSION: VIEW OF THE RADIATION ONCOLOGIST

RADES, D.

University Hospital Schleswig-Holstein. Alemania

Five to 10% of adult cancer patients develop metastatic spinal cord compression (MSCC) during the course of the disease.

Worldwide, radiotherapy (RT) alone is the most frequently used treatment for these patients. The most appropriate fractionation regimen is still debated. 1×8 Gy and 5×4 Gy in 1 week are similarly effective with respect to functional outcome when compared to 30-40 Gy in 2-4 weeks and are, therefore, preferable for patients with a poor expected survival.

According to prospective studies, longer-course programs result in better local control of MSCC than single-fraction and short-course regimens. Because the risk of a local recurrence increases with survival time, patients with a longer expected survival time should be treated with longer-course programs. It is important to be able to predict a patient's survival time, which can be facilitated by using survival scores that are already available. Selected patients with a very good survival prognosis may be considered for high-precision RT such as radiosurgery (RS) and stereotactic body radiation therapy (SBRT). Also patients with MSCC from a less radiosensitive tumor may be candidates for high-precision RT. If RS or SBRT is used, the tolerance doses of both spinal cord and vertebral bone must be considered. Selected patients with a good performance status, a good survival prognosis, an involvement of only one spinal segment by MSCC, and a solid tumor can benefit from the addition of upfront decompressive surgery with direct stabilization. In a small randomized trial of highly selected patients, post-treatment functional outcome and survival were significantly better with the combined approach than with RT alone. If an in-field recurrence of MSCC occurs after single-fraction or short-course RT, re-irradiation can be performed safely and effectively. However, the cumulative biologically effective dose should not exceed 120 Gy2. If an in-field recurrence occurs after longer-course RT with higher total doses, decompressive surgery with direct stabilization should be performed whenever possible and indicated. Otherwise, SBRT should be considered.

One has to be aware that the recommendations regarding the treatment of MSCC are mostly based on non-randomized studies. Thus, additional randomized trials are necessary to properly define the best treatment approach for a patient presenting with MSCC.

PAIN MANAGEMENT AND SUPPORTIVE CARE IN HEAD AND NECK CANCER TREATMENT

MANSO DE LEMA, A.

University Hospital La Paz. Madrid

A very special care is need around head and neck cancer treatment owning to the symptoms caused by the different toxicities secondary to the high doses of radiotherapy and chemotherapy that are the basis of radical treatment for these tumors.

Mucositis is a particular inflammation and ulceration of the membranes based in DNA damage in basal epithelial cells. Appears anywhere along the gastrointestinal tract and, in case of radiotherapy treatment, is directly related to the dose per fraction, total dose and the administration of concomitant drugs.

Oral mucositis and oesophagitis are the most frequent complications along head and neck cancer treatment (approximately 100% of patients receiving high-dose radiation). This patients show an intensely erythematous mucosa, every so often with erosions and ulcers, leading to severe pain and associating high risk of infection and malnutrition. All this conditions result in a very important deterioration of general condition with negative impact in overall survival and disease free survival if this situation leads to higher unplanned breaks and delays in radiotherapy administration.

Head and neck cancer patients are frequently malnourished, even at the time of diagnosis. In addition, chemo-radiotherapy exacerbates symptoms, such as alteration/loss of taste, mucositis, xerostomia, nausea and vomiting, with consequent worsening of malnutrition. Oral nutritional supplements and counseling should be used to increase dietary intake and to prevent weight loss and interruption of radiation therapy.

Other side-effect of radiation therapy is loco-regionalin epithelitis. In combination with the standard regimens of chemotherapy (cisplatin, fluorouracil and docetaxel) epithelitis is even more severe. Monoclonal antibodies (Cetuximab) have their own skin damage and the association with radiation increases it significantly. Once more pain and erythema are the first sign and symptom appearing. There are many preventive options recommended with varying degrees of evidence of success, same for established epithelitis.

Epithelitis and mucositis can be very painful and can markedly reduce oral intake. The main objective should be the quality of life in these patients; therefore patient controlled analgesia is an important target. The use of topical anesthetics is much extended and the agents used most commonly include anesthetic amides and esters (lidocaine and benzocaine). As we get further through the treatment It is usual the need of systemic analgesia. This should be administered when topical anesthetic strategies are not sufficient for clinical relief. Nonsteroidal anti-inflammatory are the first step, but generally these ones are not enough and adding opiates in combination with them has significantly increased the effectiveness of controlling severe mucositis pain. Not only that ones but also rapid onset opiods are useful. About these last, transmucosal fentanyl, is an opioid agonist indicated for breakthrough cancer pain in patients who are already receiving long acting opioids therapy for their underlying persistent cancer pain. The special conditions of mucosa in these patients suggest that intranasal route is an option since the oral transmucosal absorption could be altered. All these considerations are important in order to obtain an adequate control pain for the intake.

Supportive care in head and neck cancer treatment increase substantially the total cost of the process, particularly when these patients need hospitalization due severity of the complications. Avoiding these complications is as important as the management of them, but getting optimal results reducing the mucosal damage implies a multi and interdisciplinary development of care protocols.

In the long term all this secondary effects can lead to chronic sequalae as loose of taste and xerostomia with a pronounced decrease on quality of life.

UTILITY OF FOLLOW-UP IN ONCOLOGY

EXPOSITO HERNANDEZ, J.

University Hospital Virgen de las Nieves. Granada

Introduction

Once completed the process of active treatment, the cancer patient goes to a joint welfare activities we call generically as follow-up. In recent years the monitoring of cancer patients is becoming particularly important given that the incidence of cancer especially in the most common locations is increasing and that the chances of disease control in long term are higher. Both facts are making the number of patients in this situation growing.

Monitoring activities have focused classically to cover the following objectives:

— That the patient feels cared.
— Better control of undesirable effects of treatments.
— Early detection of relapse (local and remote).
— And finally to know final results.

In this presentation we will focus on four aspects that we consider crucial to think about and finally propose some remarks and recommendations.

Four aspects/views.

Utility from the patient point of view

The patient must feel that this process is interesting for him, and some general conditions must happen. The first is being welcomed as a sick person with physical needs but also psychological and spiritual. It must therefore ensure that it will be dealt quickly, with high scientific and technical quality, and having confidence that an early diagnosis of a possible relapse through different explorations may improve subsequent control. It will be necessary to consider the problems of delay in both the query and the results and use monitoring protocols based on evidence.

An interesting idea is to develop specific and personalized follow-up plans for different patients, just as we design custom specific treatment protocols (Daudt HM The all 2014).

Exams and tests: the available evidence

For decades it has been a relatively common practice, undergo patients during follow-up to imaging test and exhaustive analysis without the certainty that we were adding benefits for patients. The analysis of literature is quite eloquent in this regard. Two articles of the 90's bearing on the negative effect of monitoring breast Ca (Cariddi MD, 1994, Ghezzi P, 1994), and an economic review (Edelman MJ, 1997) emphasized the low efficiency. Through a structured search of the literature appear in the last 15 years, we have made an updated through *PubMed* and CRD (Centre for Reviews and Disseminarion) review. A total of 57 studies found most focused on concrete experiences by tumour sites (29), consensus of different societies (8) and 8 clinical trials that focus on colon tumours (FACT study, 2014), ovary (MRC OV05/EORTC 55955, 2010) and head and neck (2008), as well as on-site monitoring (primary care, specialist). This search, therefore, shows that the available evidence does not answer all the questions and that the results may be subject to various interpretations. The contents of the monitoring (testing, schedule, ...) should be an area of special interest in clinical research because the absence of high quality information.

Efficiency: workloads and overload assistance

The cancer care is increasingly becoming a more complex activity (incorporation of advanced technologies and the participation of more specialists). Maintain appropriate quality standards, with direct impact on the patient, requires organizational and task sharing between the professionals involved. The central figure of this organization is the multidisciplinary committee (MDC) in which crucial decisions for the patients are taken. But we can estimate that the follow-up activities after treatment take no less than 40-50% of all our professional work time. Usually patients are monitoring in various services (up to 78% in a study by our group). And the most visible consequences are: 1) Overloaded agendas, 2) Lack of coordination and multiple 'doors' where the patient is lost, 3) No education and morbidity goals and 4) High variability in delivery systems.

Since several instances argue for more patient-centred schemes, a step forward is recommended, going from a coordinated to an integrated organizational model. Perhaps the Functional Units (FU) can better respond to current needs (Teckie S, 2014). In this moments of special sensitivity on issues of efficiency, it's should be interesting underline that follow-up models is proposed as one of the most interesting tasks from this perspective in clinical care (Smith TJ, 2011; Health Care Improvement, USA, 2010).

Long survivors

Long survivors, patients who have had a neoplasm disease and in which after the time elapsed since completion of treatment, the probability of relapse is very low, constitute a special group of people, in which our care strategies must be not modified. Conversely, we do not usually have specific strategies designed for them. Several organizations have presented models that can guide us to move in this direction. Almost all of them call for the need to define spaces and special forms of monitoring, and promote appropriate and sensitive edition about the most worrying issues for this increasingly collective. (MacMillan Cancer Support, 2012).

Remarks and recommendations

Following this review, it seems interesting to highlights some particularly questions:

— It is essential consider the follow-up activities as a source of knowledge and assessment over the quality of our treatments in term of final results (survival and disease control) and side effects. For this reasons we must be sure to have a clinical registration systems agile, complete and accurate.
— In a systematic way we should review the adequacy of the tests we request in follow-up setting, based on evidence and in the ability to provide useful treatments for patients in whom we diagnose early relapse.
— Patients appreciate having a unique reference and are subject to minor and simple as possible follow-up protocol.
— The long survivors deserve special consideration that we are not taking into account generally. In addition to monitoring possible iatrogenic and second tumours, it is necessary to incorporate other variables and concerns oriented towards a full return to society.

SKIN CARE RADIATION ONCOLOGY

VALLEJO OCAÑA, C.

University Hospital Ramón y Cajal. Madrid

Dermatitis is one of the most frequent side effects of radiotherapy, affecting 95 percent of patients. The higher incidence is in breast cancer, head and neck cancer, lung cancer, or sarcoma, because in those patients a higher radiation dose is administered to the skin. The skin reaction usually is mild or moderate. However, 20 to 25 percent of patients experience severe grade with moist desquamation and ulceration. Radiation dermatitis has a great impact on the quality of patient's life and may be the cause of interruption of radiation therapy, resulting in inadequate treatment.

Between risk factors there are patient-related, include connective tissue diseases (ESL), obesity, diabetes mellitus, age, female sex, and smoking; treatment related factors: receiving chemotherapy agents or targeted anticancer therapy with EGFR inhibitors and region of scars and folds, increased risk of severe radiation dermatitis.

The first dose of radiation, results in irreversible damage in DNA, generation of short-lived free radicals, with immediate structural tissue damage, and initiation of an inflammatory response in the epidermis and dermis. Repeated exposure to low-dose ionizing radiation does not allow cells to repair tissue damage. The accumulation of radiation-induced injury lead to the destruction of a large proportion of basal stem cells with disruption of the self-renewing property of the epidermis, and changes to dermal vasculature, results in the progression of radiation dermatitis. The mechanism of radiation-induced inflammation is complex including damage in endothelial cells, fibroblast, immune cells, numerous cytokines are produced and degranulation of mast cells in the dermis. Some studies suggest that fibroblasts are a key cell type responsible for the late effect of radiation (fibrosis).

The severity of acute radiation dermatitis can be assessed by grading systems, usually the National Cancer Institute Common Toxicity Criteria-Adverse Event (NCI CTCAE). In that scale Grade 1, is characterized by mild, erythema or dry desquamation, frequently with pruritus. Grade 2, presents intense erythema and

edema and moist desquamation, usually limited to the skin folds. Moist desquamation is defined by epidermal necrosis, fibrinous exudates, and pain. Grade 3, confluent moist desquamation not only in skin folds. Grade 4, when moist desquamation progress to skin necrosis and ulceration. Ulcerated lesions can become secondarily infected. Pain is usually severe and may need opioid.

In most patients, radiation dermatitis is mild or moderate with complete healing in a few weeks. However, 20 to 25 percent of patients experience severe dermatitis (grade ≥3) with prolonged healing time that can result in fibrosis.

Prevention. There is no effective treatment to prevent skin damage. Nevertheless, some skin care measures can be of help for patients: washing skin with water with or without soft soap and dry gently; wearing loose clothes preferably with cotton to avoid friction; avoiding skin irritants as perfumes and alcohol lotions; avoiding sun and strong wind exposure; avoiding to scratch and shave; since start of radiotherapy using water-based, unscented and lanoline-free moisturizers; all moisturizers must be move away before radiation to avoid a bolus effect. In several small randomized trials has been suggest that topical corticosteroids may be beneficial in preventing severe radiation dermatitis and alleviate itching, burning, and discomfort. Current evidence does not support the use of other topical agents: sucralfate, calendule, aloe vera, trolamine, hyaluronic acid, almond oil, dexpanthenol for the prevention of radiation dermatitis.

Treatment of radiation dermatitis involves general skin care measures, prevention and treatment of secondary infection, treatment of pain and look after for adecuate hidratation and nutrition status. The management will depend of the severity of skin damage.

Patients with grade 1 dermatitis: Usually is enough with general skin care measures describe above.

Patients with grade 2 dermatitis: General skin care measures. Topical corticosteroids may be useful to control itch or irritation.

Patients with grade 3 dermatitis: General skin care. Nurse care are important. For moist desquamation can be use various types of dressings (hidrogel, hydrocolloid, nonadherent), even though with inconclusive results. It is very important measures to prevent secondary infection. If occurs, systemic antibiotics should be initiated.

Patients with grade 4 dermatitis are very unusual and should be treated on a case-by-case basis. They may require discontinuation of radiation therapy and a multidisciplinary approach, involving nurse, radiation oncologist and dermatologist. In some circumstances skin necrosis may require surgical debridement.

It is important to promote controlled and randomised clinical trials to define the usefulness of new or in-use products, that allow systematize management guidelines.

16:30-18:30

NEW DIRECTED TREATMENTS: FROM MOLECULAR BASIS TO CLINIC APPLICATION

IMMUNOTHERAPY AND RADIATION: A NEW FIELD FOR US?

DEMARIA, S.

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The tumor environment is highly immunosuppressive as the result of immunoediting, a selection process that maintains a dynamic equilibrium between genetically unstable neoplastic cells that survive by escaping immune rejection, and the host immune system. Therapeutic interventions perturb this equilibrium and offer an opportunity to shift the balance from immune tolerance to tumor rejection. Ionizing radiation therapy (IRT) applied locally to a tumor not only kills some of the cancer cells, but also acts as a modifier of the tumor microenvironment by inducing the release or production of pro-inflammatory factors by dying as well as surviving cancer cells. As a result, IRT can convert the tumor into an acutely inflamed site that acts as an in situ "live attenuated tumor vaccine". Experimental evidence has shown that IRT promotes cross-presentation of tumor-derived antigens by dendritic cells leading to activation of anti-tumor T cells. In addition, IRT stimulates chemokine-mediated recruitment of effector T cells to the tumor, and recognition and killing of tumor cells by T cells, mediated by up-regulation of major histocompatibility antigens, NKG2D ligands, adhesion molecules and death receptors. Activation of anti-tumor immunity likely contributes to the overall response to IRT, but it is seldom sufficient to cause an abscopal effect, i.e., regression of metastases outside of the radiation field. However, IRT is emerging as an optimal partner for immunotherapy: several immunotherapy agents have shown synergy with IRT in generating therapeutically effective anti-tumor responses.

Mechanistically, we have learned that immunotherapies that are synergistic with IRT act at one or more of three levels: (1) They improve priming by increasing DC numbers and function or by stimulating Toll Like Receptor pathways; (2) They overcome immune tolerance and/or suppression by blocking immune checkpoint receptors or neutralizing immunosuppressive cytokines; (3) They potentiate T cell activation via co-stimulatory receptors or T cell-trophic cytokines. Importantly, the success of a given combination of immunotherapy and IRT may depend on the radiation regimen employed and the dominant immunosuppressive mechanisms existing in a given tumor. Examples of combinations of IRT and immunotherapy that have shown at least preliminary evidence of success in pre-clinical models and/or in early clinical testing will be provided, and the molecular mechanisms discussed.

RADIATION-INDUCED LATE SIDE EFFECTS: BIOMARKERS IN DEVELOPMENT FOR PREDICTION

AZRIA, D.

Institut de Recherche en Cancerologie de Montpellier. Francia

Biomarkers which may predict late normal tissue reactivity to radiotherapy are necessary to personalize treatments leading to clinical benefit optimization. The ex vivo 8-Gy radiation-induced lymphocyte apoptosis (RILA) assay is the most promising one for clinical use, and showed an inverse correlation between the occurrence of radiation-induced late toxicity (RILT) and RILA values. To improve the positive predictive value of this test, we developed a quantitative proteomic approach and identified five proteins (AK2, ANXA1, APEX1, HSPA8 and IDH2) involved in redox homeostasis regulation which are significantly overexpressed in grade≥2 RILT (RILT2) patients in comparison to controls after curative intent radiotherapy. Interestingly, a significant increase in the radiation-induced radical oxygen species (ROS) production and NOX1 and NOX4 isoforms mRNA expression was observed in RILT2 patients. These findings demonstrated the potential interest of proteomic investigations to identify new radiosensitivity biomarkers and underline for the first time the role of radiation-dependent activation of NADPH oxidase in patient development of late radiotoxicity.

RADIUM 223 AND METASTATIC DISEASE IN CASTRATION RESISTANT PROSTATE CANCER

O´SULLIVAN, J.

Queen´s University. Belfast, United Kingdom

Bone metastases are a frequent sequela from a wide range of malignancies and are associated with a high degree of morbidity. They commonly result in pain, pathological fracture, metastatic spinal cord compression, as well as contributing to malignant hypercalcaemia. The impact of bone metastases on overall mortality has been more difficult to elucidate. With regard specifically to prostate cancer it is has been found that 90% of patients with metastatic castrate resistant prostate cancer (mCRPC) have bone metastases, often the only significant metastases site.

Bone metastases are a source of major symptomatic burden and are particularly common in metastatic prostate cancer. Bone targeted therapy has included bone-seeking radionuiclides for nearly 30 years. The beta-emitting bone-seeking radionuclides Strontium-89 and Samarium-153 EDTMP as well as Rhenium-186 HEDP and Rhenium-188 HEDP have been used to palliate pain in advanced cancer metastatic to bone for many years. Despite clear evidence of benefit in palliation, these agents have never been shown to result in a survival benefit for patients.

Radium-223 is the first in class alpha-emitting radionuclide which began clinical testing almost 10 years ago and has recently become licenced for the treatment of castration resistant prostate cancer (CRPC) metastatic to bone. In an international prospective randomised clinical trial, Radium-223 (50 kBq/kg, for 6 cycles at 4 weekly intervals) + best standard of care (BOS) was shown to improve overall survival compared to placebo + BOS in men with symptomatic, metastatic CRPC. Radium-223 also resulted in significant improvement in time to symptomatic progression. Radium-223 was very well tolerated with very few serious toxicities recorded.

The rationale for using bone-targeted radionuclide therapy in CRPC will be discussed along with postulation on the likelihood of combination therapies using Radium-223.

16:30-19:30

NEW INFORMATION AND RADIATION ONCOLOGY TECHNOLOGIES: RT 2.0 HEALTH, EMPOWERMENT, OPPORTUNITY AND CHALLENGES

MAIN RRSS VIRTUAL COMMUNITIES AND APPLIED TO RADIATION ONCOLOGY "FACEBOOK"

RODRIGUEZ MELCON, I.

University Hospital of Great Canary Doctor Negrin. Las Palmas de Gran Canaria

With the help of social networks, now Internet occupies the podium of the immediacy as mass medium, surpassing TV and radio in durability and allowing the access to an original source from a post or a tweet in a few clicks. Currently, two internet models coexist: the web 1.0, based on a "seek-and-find" structure, where the paradigm is Google, and the web 2.0, based on the "do, participate and share", in which the paradigm is Facebook and other social networks. From 2007 to 2012 Facebook went from 50 million users worldwide to 1 billion, and at the moment reaches 1,390 million users. According to data from 2014, Spain has an online population of 23 million people, 73% of which (17 million users) actively use social networks. 88% of Spaniards who use the Internet have a Facebook account and access to it from multiple platforms, including smartphones. The concept of social network is based on sharing experiences: the perception of other people about something affects the rest of society and has implications beyond the usual controls. Peer comments on products, services, companies or professionals influence the success or failure thereof. Any online service relies on viral marketing: a recommendation from a user to another potential one can produce exponential increases in brand recognition. This situation is not unrelated to health information and oncology in particular. Up to 50% of cancer patients seek cancer information on the Internet at some point in their illness, and it is estimated that an additional 15-20% use Internet indirectly through family or friends. Cancer patients are in a situation of vulnerability due to traumatic experience that involves the diagnosis received, the need to share complex information with a high emotional component, insecurity that involves making decisions about treatments to receive and uncertainty about its outcomes. In most cases such feelings urge patient or his family to seek information and makes them particularly sensitive to the content they receive. In addition, community relations are established in virtual groups formed by other patients or relatives of patients with the same condition, in which experiences, psychosocial support, adaptation and personal strategies to cope with the disease are shared.

TWITTER: E-HEALTH, E-PATIENTS, E-DOCTORS. RADIATION ONCOLOGY 2.0

CABRERA RODRIGUEZ, J.

Infanta Cristina Hospital. Badajoz

Social Networks (SN) have been introduced deep in our ways of communication, transcending mere entertainment to the professional field.

SN permits easier transmission of information in accordance with the interests of the user in an instant, tailored way. In a discipline, interactive by nature, such as medicine, SN has invaded at all levels: congresses, meetings, journals, chats, personal interaction with colleagues from all over the world, and patients and organizations too.

The SN user wants to communicate, therefore, is a person favorably predisposed to interaction, to share knowledge, to know. The SN are, thus, with excellent qualities to provide a friendly and professional framework for the exchange of views on an informal basis, but without losing rigor since the ability of interaction in real time allows the user to tailor the content to its specific interests quickly.

Twitter, the micro blogging social network, has emerged as a particularly preferred means in the health world by their agility, versatility and ease of access to people and the specific interests of each user.

The talk will discuss the peculiarities of this social network, the advantages and horizons of information provided. We will analyze the different options of interaction of a system seemingly limited by the number of characters (140) available for a post. The security and privacy of the user and patients, as well the quality of information posted will be also talking points.

SOCIAL NETWORKS AND ONCOLOGY: LINKEDIN

WALS ZURITA, A.

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Was born 'analog' in the year 1961. There were no personal computers, there were no mobile phones, there was no Internet social networks is called sitting. While i grew a computing pioneer American called Joseph Carl Robnett Licklider (1915-1990) had already spent some time in the computer field and made the first ideas of a global computer network in the year 1962. These ideas contained almost everything that is internet today, including the 'cloud computing'.

During my times in high school and student of medicine and (at the end of the 70 and 80) appeared the first 'computers' (the word computer not rennet in Spain) and i groped. One of Sinclair ZX Spectrum was touched by my fingers. And some small 'programs' left for my personal enjoyment.

While internal medical first-year resident, i bought my first PC with Intel 80386 processor, hard disk and floppy drive with a 5 1/4 and the other 3 1/2. Since then I have not taken off from a PC. Now I write this information on an iMac in late 2012 updated to the latest version of OS X (10.10.2; Yosemite). I have accounts on Twitter, Facebook, LinkedIn, and Google +. The amount of useful information (and the useless also) for the ongoing training which you can obtain exceeds the capacity to process it. As a professional, a good way to be placed in social networks is Linkedin.

LinkedIn connects you to other professionals with their explicit consent by creating a network of contacts, but the goal should be clear and be selective. Be for being is to lose the time, this is not the goal. Very briefly the objectives consistent with the topic of concern to us (oncology) are: to know professionals to share and exchange views, to learn more about any particular subject (groups). consolidarte as 'expert' in any field (mark)" finding suppliers of services/products. For this a picture of yourself and a profile (curriculum) completed is essential. Well same validation of skills by colleagues in your network are converted in a simple and effective way to create your professional brand. The validation of skills on your part to other professionals contributes to the credibility of their profiles. The relationship between health professionals there is that 'nurture'. Can not pretend to enter and 'collecting results'. There is that 'give'. Provide content, participate in groups, give an opinion in discussions. If one is limited to putting a profile and little more, this is not enough. There is to be generous and polite. Give, ask for help on a topic, to thank. Link the account to other networks such as Twitter is perfect. How much time to spend on LinkedIn?, daily at least between 15-30 minutes.

One of the most interesting uses are the groups: group of LinkedIn provide a virtual space that the professionals of the same sector or with similar interests can share content, find answers... etc. You can join one or create one of your own. Another use is to share documents in the form of presentations via slideshare. In short, share information and scientific research.

THE BLOGOSPHERE: WHY WRITE A BLOG RADIATION ONCOLOGY? EXPERIENCES IN OUR COUNTRY: CARPE DIEM

MUÑOZ MIGUELAÑEZ, T.

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A blog is a website whose owner can edit and share contents easily. A typical blog combines text, images, and links to other blogs, web pages, and other media related to its topic (eg: health).

In my opinion its two most important advantages are: It is the easiest way to have digital presence and it allows interaction with readers.

My blog "Carpe Diem" was born five years ago because I enjoy writing. Over time, I discovered all the possibilities offered me to have my own blog and today is a place where I share content about my specialty: the Radiation Oncology, focusing on patients, medical students and resident physicians.

With Carpe Diem I learn by sharing information. If you like writing, sharing and learning I encourage you to try the experience of having a blog. Just answer the following questions before you start writing: Who is my target audience?; What information do I want to share?. I think it can be very rewarding for you.

INFORMATION & COMMUNICATION TECHNOLOGIES (ICT): NEW TOOLS IN A NEW WORLD FOR A NEW MEDICAL CHALLENGE

MONTERO LUIS, A.

University Hospital HM Sanchinarro. Madrid

The rise of mobile technology are transforming the way in which we are learning and practicing medicine, oncology and radiotherapy. The internet is rapidly growing. Many people seek answers for their various lives' circumstances on the web. Radiation oncologists need to become familiar with social networks and the flow of information for both patients and professionals. A significant number of oncologists, as well as cancer patients, utilize the Internet to obtain information about cancer. Radiation oncologists must be familiarized with this resource because of the potential uses of social media in cancer. Thus, the creation and use of online information sources through Internet and Web 2.0 platforms are radically changing the way in which we consider therapeutic options, share clinical information, discus cases among colleagues and updated with the most recent scientific publications. Social networks, mobile medical apps or medical blogs are just examples of how the internet has changed, completely and forever, our relationship with the disease, the patients and other doctors. New technologies have introduced new decision-making tools in the daily practice.

Mobile apps have been created to help individuals in their own health management, but also to provide tools for clinicians for improving clinical attendance. Nearly 300 mobile apps for Oncology professionals can be found on both on-line stores, iTunes (iOS) and GooglePlay (Android), but less than 100 are designed for Radiation Oncologists. However, since June-2014 iOncoR, the first mobile app in Spanish specifically designed for the practice of Radiation Oncologists, is available for iOS and Android, and has been downloaded more than 1000 times of both platforms, demonstrating the undeniable irruption of these new technologies in the clinical practice.

More and more evident, social networks have become the preferred way for information for hundreds of patients. No one can doubt that social networks are the new ways of communication that have emerged with the unstoppable expansion of World Wide Web. Users and followers are constantly increasing, reaching numbers really amazing: Facebook is the largest networking service founded, with ~1.15 billion active users as of March 2013 and many institutions and societies have their own pages; microblogging service Twitter has ~554 million active users as of November 2013 and the professional network LinkedIn was used by ~259 million members as of June 2013. Other professional networks such as ResearchGate are increasingly gaining acceptance in the medical community. These numbers give an idea of the magnitude that social networks have achieved in communications in the XXI century.

Medical blogs have become a favorite tool to access specific information about a particular health problem. And oncology is no exception to this practice. There are many, and each day there are new, doctors blogs aimed at professionals and patients, and its subject is as varied as their number: information, discussion, technical descriptions, resolving doubts about treatment.

All these new tools, although they may seem complex before facing them, are not the future, but rather the present in which we must all develop ourselves. And the knowledge and mastery of these is essential for the development of oncology and radiotherapy.

ONCOLOGY CANARY

RODRIGUEZ MELCON, I.

University Hospital of Great Canary Doctor Negrín. Las Palmas de Gran Canaria

In the last decade the three traditional mass media —newspapers, radio and TV— have been displaced by the Internet as a source of medical knowledge to the general public. Internet has been established for citizenship as the preferred medium to search information on health issues in general and cancer in particular, and is no longer a tool reserved only for higher sociocultural level strata. The power of instant access to virtually any public information has redefined the medical-society relationship and therefore the doctor-patient relationship. In addition, with the widespread of broadband, Internet allows interactive medical services. Doctors are no longer the sole custodians of knowledge that the patient cannot access and that upsets the balance between them. The increased availability of information for society requires that oncology professionals know new media, react and adapt to change. There are countless websites with medical information for cancer patients, and the greater the number of web pages and the information available, the lower the mechanisms of control over their rigor and scientific level. The net has unlimited potential of communication and information dissemination, but those benefits accompany side effects. Although there are initiatives to draw up rules for the accreditation of health websites, to date there is no formal accreditation to ensure the quality of its contents. The latter is particularly important in oncology, where erroneous, incomplete or biased information can be dangerous if not in their context and explained by a professional. Health is one of the most universal interests on the Internet, and therefore anyone with access to it is potentially an e-patient. The movement of e-patients is a symptom of a more radical change in society, towards more empowered citizens committed to their health. E-patients are destined to make decisions about their health in close collaboration with professionals. The interest of well-informed patients in their illness and being part of the decision making process that affect them, is not only a reality without turning back, but can be a foothold to establish a stronger therapeutic alliance, as will allow decisions closer to the patient's wishes without leaving scientific knowledge.

RADIATION ONCOLOGY HUELVA

MUÑOZ CARMONA, D.

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Writing on Blogs is a concept started in the late 90s were new forms of expression, where all kinds of situations were discussed, from the comment of a web page, as the opportunity that have readers and visitors to comment different articles expressing their opinion and being a meeting point for people with different or similar interests, depending on the theme of the blog.

In my case it was a way of expressing that Radiation Oncology was at the height of the specialty, starting with simple tests with simple comments to articles, to evolve into pages where I could fill and share items considered important in oncology.

At first it seemed a very simple task. It is a simple way to get a space on the network through the publication of the point of view of Radiation Oncology on Huelva. We didn´t need special skills, although every start costs, but the idea was to have a virtual piece of paper where all Oncologists from Juan Ramón Jiménez Hospital could express their ideas, experiences, progress, protocols in use, and encourage comments from the population both specialized and non-professionals who would want to tell us something. Writing Radiation Oncology Huelva Blog was a real challenge, and during this time of existence, we have tried to question the reality of many articles, moving increasingly to relevant aspects of each article. Although, the Blog became more specific with articles about Lung Cancer and CNS tumors. Gradually we were beginning to write about our experiences and we received feedback from readers as it is important in all areas of work. We wanted to concern the non-doctors population about how radiation oncology had and has a key role in cancer treatment, which is not so unknown for oncology professionals. We began to create "Credibility and Knowledge".

Another objective of Radiation Oncology Blog Huelva was to create a market of readers through the written scientific articles. Was more than give an email or submit an article to a colleague. We wanted to share articles that from our point of view had scientific value, with relevance at least for us, important, but also with personality, without the coldness of an article itself, and the brevity of something that deserves to be read. In this duality we moved, writing about vital issues in radiation oncology and opinions that all of us could post on the blog. It was hard to find that balance and we gradually create the personality of this blog, leaded to the relevance of articles published and the opinions of those who read it.

At first, we doubted of which were our readers, we knew nothing about this "reader", which conditioned us to prepare content which arouse their interest. We had more or less the idea that they should be people who for one reason or another have an interest in radiation oncology or oncology in general, either by profession or by the "vicissitudes of life" pretending to help them solve problems that really concerned or affected at that particular time. The daily development of the blog made it to start commenting specific articles of interest to the specialty.

It is true that we write for being read, the more public the better, but sometimes, the future, your education, your interests or your ideas make the online blog to pass to have more specific and professional general interest, but that was the evolution of our blog since its creation in 2007.

Since then we have tried to fight with the miracle of not boring readers, not boring ourselves, maintain and create interest, although it's difficult.

Likewise we realized that we took time to write, and our time is limited, sometimes without a clearly tangible benefit.

In summary, the goals we set in the Radiation Oncology Huelva Blog were:

— Share comments and articles that we thought relevant to the specialty.
— Learning from the experience of the articles we published.
— Interact with the posible readers.
— Check and see how far we could get with the creation of the blog, as personal and professional experience.

THE BLOG "*UN RAYO DE ESPERANZA. BLOG DE UNA RADIONCÓLOGA*"

RUIZ MARTIN, V.

University complex care. Burgos

The blog "*Un Rayo de Esperanza. Blog de una radioncóloga*" was born with the spirit of making visible and to inform to public and the individual patients what is the Radiation Oncology. Through this disclosure I have tried to integrate all aspects of concern about cancer patients and to relate to our specialty, placing value on the human side of the patient. To do this I do assert other links, books and films that bring us to the reality that they live. It also tries to give a holistic or global vision of Oncology explaining the integration of other treatment modalities with our specialty.

19:00-20:00
SEOR'S HYPERTHERMIA GROUP

PRESENTATION OF THE GROUP OF HIPERTERMIA OF THE SEOR

HERRUZO CABRERA, I. (University Hospital Virgen de la Victoria. Málaga); CONTRERAS MARTINEZ, J. (Regional Hospital University. Málaga)

Hyperthermia group of the SEOR

The proposed group will follow the common characteristics of the Working Groups of SEOR what grouping Radiation Oncology professionals who come together to work more specifically on the specific area, in this case, of oncological hyperthermia, if applicable with the support of other specialists or experts, but always within the SEOR.

Its will aim the study, publication and dissemination of the knowledge area of hyperthermia applied to the field of oncology, of interest to the specialty of Radiation Oncology, though not his specific role the development of clinical trials, unable to act as promoters, and its promotion through the research group GICOR.

Other objectives will also promote scientific production (publishing books, guides, items, etc.), training (completion or participation in courses for resident physicians, specialists, etc., preferably accredited courses) and development of practice guidelines clinical and quality control in the specific treatment of their condition or area of development.

Finally, once it is formed and approved as group SEOR, you must create an identifying name with its corresponding logo, constituted as a group with a coordinator and a board of directors and be open to other partners SEOR interested in this specific field, as well as interlocutor between partners SEOR for:

— Promote initiatives to improve cancer treatment with hyperthermia within the specialty field of Oncology and more specifically in the Radiation Oncology.
— Disseminate its use and development in our country where currently poorly developed and integrate our partnership with other European and international companies leading the discipline of treatment.
— Propose GICOR studies in the specific field of Oncology Hyperthermia (basic, clinical and clinical trials).

At the meeting of creation, its submission on the basis of oncological hyperthermia, its biological foundations, to European and international consensus on the use of hyperthermia in cancer and preliminary results of the first clinical trial in Andalusia be discussed with intend to extend participation in other clinical centers that are incorporated national technical tests and in the near future to participate in international multicenter trials.

This assay has the design studio "case-control", first carried out in Andalusia and Spain, in which two Andalusian centers, the Regional Malaga Hospital and Juan Ramón Jiménez Hospital from Huelva, comprising a prospective study treatment phase associated with deep hyperthermia cancer treatment standard radiotherapy, chemotherapy or combination of both, in nine cancer sites in which we evaluate the feasibility, tolerability and comfort with treatment in the context of public health, and secondarily toxicity specifies both the HT and the resulting combined treatment. The quality of treatment were also evaluated from the physical point of view characterizing the heat distribution in a phantom simulating treatment conditions.

Treatment is feasible, with a high degree satisfaction of 80.8% (very satisfied or satisfied) and comfortable or very comfortable in 78.9% of patients, in the public health environment. The toxicity is absent in 44% and mild in 56%. Proper selection of patients is essential.

19:00-20:00
QUALITY IN THE RADIATION ONCOLOGY. RISK MATRICES

PATIENT SAFETY IN RADIATION ONCOLOGY. COMPARISON OF THE MOST IMPORTANT INTERNATIONAL PUBLICATIONS AND CURRENT LEGISLATION IN SPAIN

PARDO MASFERRER, J.

University Hospital Son Espases. Palma de Mallorca

The aim of the Patient Safety and Quality Control Working Group of Spanish Society of Radiation Oncology was to analyse if the current Spanish Legislation, Royal Decrees 1566/1998 (about Quality Criteria in Radiotherapy) and 815/2001 (about Justification of medical exposure to ionizing radiation), include the international recommendations on patient safety, and, if not, to recommend implementing appropriate measures to correct any possible deficiencies in this regard.

The following documents had been reviewed: Towards Safer Radiotherapy elaborated in 2007 by a working party of representatives of the Royal College of Radiologists, the Society and College of Radiographers, the institute of Physics and Engineering in Medicine, the National Safety Agency, the national Patient Safety Agency, the Health Protection Agency, the British Institute of Radiology and patients. Radiotherapy Risk Profile published in 2008 by the World Health Organization, specifically by an expert group facilitated by the WHO World Alliance for Patient Safety. Failure Modes and Effects Analysis (FMEA) reported in 2008 by the American Association of Physicists in Medicine and the Washington University School of Medicine. Preventing Accidental Exposures from New External Beam Radiation Therapy Technologies, elaborated by the international Commission Od Radiological Protection in 2010. Safety in Radiation Therapy: A Call to Action meeting recommendations (from the Meeting Safety in Radiation Therapy-A call to action held in Miami in 2010) sponsored by American Association of Physicists in Medicine and the American Society for Radiation Oncology and published in 2011. Safety is not accident (2nd ed.) published in 2012 by the Ameri-

can Society for Radiation Oncology and 11 more organizations. Recommendations for safer radiotherapy: What's the message? published in 2012. Consensus recommendations for incident learning database structures in radiation oncology published also in 2012. Directive 2013/59/Euratom of the European Union and Guidelines for equipment and staffing of radiotherapy facilities in the European countries: Final results of the ESTRO-HERO survey, both published in 2014.

From these documents, a number of topics were selected to compare with obligations regarding Patient Safety in Radiation Oncology specified in the current Spanish legislation Royal Decree 1566/1998, regarding about Quality Criteria in Radiotherapy, and Royal Decree 815/2001 relating to justification of medical exposure to ionizing radiation. The topics compared related to: professional qualification, professional training, staffing, documentation, standard operating procedures, incident learning, communication (discussing/questioning), peer review, quality control and preventive maintenance, accreditation, map of processes/risks, prospective risk assessment, strategies and tools development for minimizing risks and safety culture.

The results of the comparative review show that current Spanish legislation include none of these issues: Relationship between staffing criteria and patient safety, Specifications about the number and quality of the documents that depend on a map of processes, incident tracking, analysing, sharing and learning, open communication and respectful questioning and discussing, peer review, maps of processes/risks and prospective risk assessment, strategies and tools for minimizing risks and safety culture.

In spite of the lack of legal regulations, it's clear that creating an error-free environment is an essential part of any radiation oncology department. There is a need to promote the knowledge and culture of patient safety between all radiation oncology staff in Spain, improving information and training on Quality Control and Patient Safety, developing and implementing systems to inform and report adverse events, and elaborate a complete document regarding Spanish Society of Radiation Oncology recommendations.

Furthermore, the current Spanish legislation should be reviewed and updated, following and developing the international organizations recommendations and considering the collaborative model. Taking this into account, we have made recommendations to be included in the final version of Patient Safety Strategy of the National Health System 2014-2018.

RISK ANALYSIS IN RADIATION THERAPY: NEW PARADIGM OF QUALITY. SPANISH EXPERIENCE IN THE CONTEXT OF THE EUROPEAN UNION

DELGADO RODRIGUEZ, J.M.

University Hospital October 12. Madrid

Radiation therapy is one of the most important therapeutic procedures in the treatment of oncologic disease. It requires an increasingly sophisticated technology coordinated by a multidisciplinary group of professionals. However, deviations that result in adverse effects with important consequences for patients, occasionally, occur. Over the past decade a significant number of accidents causing deaths and injuries to patients have been reported and investigated by different organizations. In 2011, errors in Radiotherapy were identified as one of the ten potential hazards associated with the technology included in medical practice.

Several international agencies have addressed the importance of patient safety in radiatiotherapy and human factors have been predominantly identified as the most usual cause of error. The reporting system encouraged so far, although considered as a very important tool to improve patient safety, would not be enough to specifically prevent those events that have not yet occurred. Not only that, until recently, recommended published guidelines were focused on monitoring the quality control of the radiotherapy equipment involved in treatments. However the complexity of new treatments makes quality control requirements an expenditure of time which may compete with the time usage of the units needed for the patient's treatment.

Risk management should include both proactive and reactive measures. Proactive measures to identify potential hazards and prevent errors. These include process maps, statistical process control and analytical methods such as fault tree analysis, analysis of failure modes and effects (FMEA), human factors methods, among others. Reactive measures focus on the mistakes once an incident has occurred, for example, root cause analysis, among other methods, but also incident reporting and investigation. Data from reactive measures should also be used in a feedback process to improve proactive action in security management.

The International Atomic Energy Agency and the International Commission on Radiological Protection have encouraged in several documents the use of prospective studies such as Probabilistic Safety Assessment (PSA) and Risk Matrix methodology applied to radiotherapy as a tool to prevent the occurrence of adverse error-events and near misses in this medical practice.

At European level, risk analysis in radiotherapy have been considered paramount leading to the publication of the (ACCIRAD) "Guidelines on a risk analysis of accidental and unintended Exposures in radiotherapy" released by the Europe Commission in 2011 with two main goals objective:

— To analyze the implementation of the requirements related to accidents and unintentional exposures (Article 11 of Directive 97/43/Euratom. (Medical Exposure Directive, MED within the European Union countries).
— To develop guidelines for risk analysis of accidents and unintentional exposures in external beam radiotherapy.

The results collected from 38 countries in Europe, indicate non-uniform implementation of event registration and classification, as well as incomplete or zero implementation of risk assessment and events analysis.

The new European Union Directive 2013/59/EURATOM that establishes the Basic Standards for Protection against the hazards of exposure to Ionizing Radiation Safety, requires in its article 63, "Exhibition accidental and unintended", that for the radiotherapeutic practices, the quality assurance program shall include a study of the risk of accidental or unintended exposures.

In Spain, the professional societies involved in radiotherapy, supported by the Nuclear Safety Council, carried out the MARR project, (Risk Matrix in Radiotherapy). The goal of the project, based on the risk analysis projects developed by the Iberoamerican Forum of Nuclear and Radiological Regulators and published in different publications, is to adapt this analysis to the Spanish medical practice.

The methodology involves the analysis of the radiotherapy process searching for events that might result in an adverse event. This analysis, based in the knowledge provided by a previous thorough risk method like PSA and in expert judgment, combines algebraically the frequency of the event with the consequences and the probability of failure of the barriers. As a result a "risk profile" for each process can be obtained and a continuous improvement plan can be established by modifying processes and implementing barriers that mitigates or eliminates the risk associated. The MARR project, carried out with the collaboration of twelve main hospitals within the country, enabled to assess and evaluate the usefulness of this risk methodology in order to aim to be a national reference. The risk matrix methodology ap-

plied in the MARR project may be considered as a way to encourage the implementation of risk analysis in radiotherapy services to comply with the new European requirements.

19:00-20:00
SYMPOSIUM

MANAGEMENT OF SEIZURES IN CANCER PATIENTS

CONDE MORENO, A.

Provincial Hospital. Castellón

The aim of this conference is to describe the different causes of epilepsy in the oncology patient and the keys to their management. Epileptic seizures are a frequent and limiting complication of patients with cancer (Glantz, et al. 2000; Hildebrand, et al. 2005; Rossetti and Stupp 2010; Singh, et al. 2007; van Breemen, et al. 2007). As many as 30%-50% of patients with brain tumours will have an epileptic seizure during the course of their disease (van Breemen et al. 2007) and is one of the most important risk factors for long-term disability.

Management of seizures is crucial in the treatment of both primary and metastatic brain tumours, but can be complicated (Glantz et al. 2000). The main treatments available for seizures are antiepileptic drugs (AEDs). In patients with brain tumours experiencing seizures, the adverse events and drug interactions associated with traditional AEDs are seen more frequently than in the general epilepsy population (Glantz et al. 2000; Smith 2010). Some of the traditional AEDs (such as phenytoin, carbamazepine and phenobarbital) interact with corticosteroids, a universal treatment for brain tumours, reducing their efficacy (Chalk, et al. 1984; Gambertoglio, et al. 1984; Haque, et al. 1972). Some AEDs also interact with cytochrome P450, causing accelerated metabolism of the majority of chemotherapeutic agents given for the treatment of brain tumours (Reich and Bachur 1976; Warren and Bender 1977). Furthermore, the metabolism of AEDs can be altered by corticosteroids and chemotherapies, leading to under- and overdosing (Fincham and Schottelius 1979; Perucca and Pisani 1991). As such, identifying an AED which can ensure a high and proven efficacy, presents low and/or manageable toxicity with low drug-drug interactions, and is easy and quick to titrate is essential.

SYMPTOM MANAGEMENT OF PATIENTS WITH BRAIN TUMOR

ZURITA HERRERA, M.

University Hospital Virgen de las Nieves. Granada

Patients with brain tumors require attention to medical issues resulting from their disease or this therapy. After primary treatment for the tumor, the patient can present vasogenic edema, symptomatic venous thrombosis, infections, endocrine problems, and fatigue and mood alterations. Depending on the location of the lesions, supratentorial or infratentorial will present a combination of different symptoms that can range from vague cognitive disorders, headaches or seizures, symptoms of intracranial hypertension or specific focal symptoms or clinical features brainstem compression.

Almost all patients receive corticosteroids that help control peritumoral vasogenic edema and alleviate accompanying sings and symptoms. There are no standardized guidelines for the timing, dose, duration, and taper schedule of steroids despite their widespread use in neuro-oncology. Unfortunately, the side effects limit their long-term use. The incidence of toxicite is related to cumulative dose and duration of treatment and may be neurological o nonneurological and given the widespread use of steroids is necessary to know these side effects and thus minimize hospital admissions and achieve an increase in the quality of life of patients.

Venous thromboembolism (VTE) is a common cause of morbidity and mortality among patients with brain tumors of all types, particularly in the postoperative period. Risk factors for VTE in patients with high-grade glioma include age higher than 60 years, large size of tumor, and paretic leg. Treatment with low-molecular-weight heparin (LMWH) adjusted by weight is contraindicated in neurosurgery performed or planned within 2 weeks of VTE, prior thrombocytopenia while using any preparation, active systemic bleeding, platelet count <40000, endocarditis, or uncontrolled systemic hypertension and primary tumor histology consistent with high risk of spontaneous hemorrhage.

As antiangiogenic agents assume an increasing role in brain tumor therapy, a growing group of patients may be at risk for both hemorrhagic and thrombotic complications.

During and just after radiation, many patients experience profound fatigue. Anemia, antiepileptic drugs (AEDs), chemotherapy, depression, and adverse effects of weight gain and other issues related to steroid use or steroid withdrawal all contribute. Reducing AEDs, instituting antidepressant therapy, and correcting metabolic abnormalities may help many patients.

Long-term survivors of brain tumors can present neuroendocrine complications, cognitive problems, as a result of the direct effets of the tumor and the sequelae of therapy, it is likely that these complications will increase in importance.

The incidence of radiation-induced damage to the hypothalamic-pituitary axis in adults is uncertain but may exceed 30% when the hypothalamus and pituitary are in the radiation field (children and young adults are the most vulnerable). In adults, the growth hormone axis is most sensitive to radiation.

Radiation therapy can cause functional deficits in memory, attention, and executive function and affect the patient´s quality of life. The use of intensity-modulated radiation therapy or proton-beam therapy as well as strategies to spare the hippocampus can minimize these adverse effects.

Directed studies are needed to mood and cognitive dysfunction of vital importance to improve the welfare of these patients.

Friday, june 5

09:00-11:00
HEAD AND NECK CANCER

CURRENT EVIDENCE IN THE INDICATIONS AND USAGE OF RT

ARIAS DE LA VEGA, F.

Hospital complex. Navarra

The field of Clinical radiation therapy begun at the International Congress of Oncology in Paris in 1922, where Coutard and Hau-

tant presented evidence that advanced laryngeal cáncer could be without disastrous, treatment produced séquelas. From this date, there have been continuous investigations to improve the results or decrease the sequelae of the radiotherapy. These advances are coming from three different investigational areas: the technological area, with the constant advance in precision of the radiotherapy and decreasing the secondary effects: IMRT, IGRT, SBRT, IORT,etc; Clinical investigation trougth pivotal trials that have established the current standard treatment; and finally, the knowledge and understanding of the molecular biology in CCC. In this presentation we will review the most important advances in all these areas.

ADVANCES AND DEVELOPMENT OF FUTURE IN HIS BOARDING

GIRALT LOPEZ DE SAGREDO, J.

University Hospital Vall d´Hebron. Barcelona

The benefit of intensity-modulated radiation therapy (IMRT) in the treatment of head-and-neck cancer (HNC) has been demonstrated in numerous studies. Highly conformal radiation allows for a high dose to high-risk areas, whilst sparing adjacent organs at risk (OAR) such as the parotid glands. Clinical studies have shown that IMRT reduces grade-3 xerostomia in comparison to three-dimensional conformal radiotherapy. The next step is to develop dose-escalation studies, that so called "Dose painting". Dose-painting IMRT is aimed at exploiting inhomogeneous dose distributions adapted to tumor heterogeneity. Tumor regions of increased radiation resistance receive escalated dose levels, whereas radiation-sensitive regions receive conventional or even de-escalated dose levels. Dose painting relies on biologic imaging. On the other hand, the changes to the dose distribution during treatment based on specific patients variations due to weight loss and tumor shrink must be corrected. For that purpose Adaptative Radiotherapy is developed. This is done by means of:

— Image guided RT: Repositioning of the patient at the time of treatment.
— Dose tracking: Computiong fraction dose based on daily cone-beam CT, accumulating dose by deformable registration and evaluating the accumulated dose at different organs.
— Replanning: Adapt the dose to a systematic volumentric changes and compensate for undesired dose accumulation.

We will review the whole process and we will discuss the clinical data published and some of the new trials that are under evaluation.

CONTROVERSIES IN HEAD AND NECK TUMOURS MANAGEMENT. CLINICAL CASES

GARCIA MIRAGALL, E.

University Hospital Virgen de la Victoria. Málaga

The management of Head and Neck Tumours differs from the standarized clinical practice in other tumour locations.

Different tumour areas are involved with also different nodal and distant dissemination patterns. In such complex scenario, clinical guides and consensus statements do not always solve individual problems.

For that reason both medical and surgical specialities are implicated in the treatment of head and neck tumours representing an excellent example of a multidisciplinary approach.

Nevertheless, so often, there will be more than one therapeutic option to treat the patient and, moreover, different schemes of systemic and radiation treatments could be used.

In this session we will show these controversies through clinical cases, in a similar way to our day by day current practice in head and neck committees. Our goal is to highlight the different therapeutic alternatives and remark the sometimes difficult decision making, in which the patient and their environment have a prominent role.

Sometimes these controversial questions will be resolved in clinical trials, but, in others, personal experience, clinical practice or patient decision could help us to decide.

In early tumours the organ- and function preservation should be the goal. Although radiotherapy and surgery would compete in the treatment of early tumours, the location and the functionality are fundamental to choose the treatment.

In advanced cases, combined treatment is essential, although timing and extent of such treatments is under discussion. New radiotherapy techniques (IMRT, IGRT,Hyperfractionaion) and systemic treatments (Targeted Biological Treatments) could improve clinical results.

We will present one clinical case about conservative treatment, one initial tumour and finally one advanced case.

09:00-11:00
UROLOGY

BRACHYTHERAPY IN HIGH RISK PROSTATE CANCER

YAMADA, Y.

Memorial Sloan Cancer Center. New York, EE.UU.

High risk prostate cancer encompasses a wide clinical spectrum of disease, from localized curable disease to patients with a high probability of distant metastases at presentation. Nonetheless, there is no question that effective local therapy is important for overall outcomes for patients with high risk prostate cancer. Local control is important in terms of biochemical and distant metastases free survival, as well as overall survival. In the modern era of PSA testing, the probability of localized disease in patients with high risk prostate cancer is still very high. Randomized trials have failed to show a benefit to regional lymph node irradiation, likely because the risk of lymph node metastases is low and thus these studies may of been underpowered to demonstrate a benefit to radiation beyond the prostate. Furthermore, multiple dose escalation studies have consistently demonstrated a benefit for dose escalation to the prostate for patients with high risk prostate cancer. Biopsy data from Memorial Sloan Kettering has demonstrated that patients who fail to achieve negative biopsies are more likely to develop distant metastases and as a group will have inferior survival compared to those with no evidence of active cancer on biopsies after radiation. Since higher doses to the prostate result in improved outcomes, even in high risk patients, dose escalation strategies are a critical component of successful treatment of localized high risk disease. Ten year outcomes incorporating brachytherapy for high risk disease also reinforce the importance of high dose treatment.

Brachytherapy may be the best way to increase dose escalate. Because of the inverse dose law, brachytherapy can deliver higher doses to the prostate while minimizing dose to the bladder, rectum and urethra. Brachytherapy dose distributions cannot be matched by even the most sophisticated image guided treatment techniques. In addition, brachytherapy is not subject to organ

motion uncertainty, making intra-organ dose escalation to tumor bearing areas a matter of course, while maintaining normal tissue dose volume constraints. Modern imaging such a multi parametric MRI can be incorporated into the treatment plan in such cases. An added advantage of high dose rate brachytherapy is to give hypofractionated radiation. Most radiobiologists agree that the optimal dose fractionation schedule for prostate cancer is high dose per fraction treatment. Because of the inherent dose inhomogeneity that brachytherapy provides, high dose rate brachytherapy is able to deliver extremely hypofractionated treatment to the tumor laden areas of the prostate while maintaining low doses to dose sensitive normal tissues. Hence it is able to take advantage of the unique radiobiologic characteristics of prostate cancer without risking normal tissues. The literature bears this out: outcomes with brachytherapy are better than with external beam only treatment for high risk disease, and toxicity is acceptable.

An extreme example of the advantages of brachytherapy is its use as a salvage therapy for locally recurrent prostate cancer. In patients who received up to 86 Gy to the prostate and then locally failed treatment can be successfully salvaged, where every patient by definition has radioresistant disease. This can be accomplished without excessive toxicity, particularly rectal complications, even after high dose external beam radiation.

In summary, brachytherapy has inherent advantages that allow for effective dose escalation in a group of patients where the dose is critical.

ROLE OF RADIATION ONCOLOGISTS IN DESIGN AND PARTICIPATION IN CLINICAL TRIALS IN GU

HOSKIN, P.

Mount Vernon Hospital. Middlesex, United Kingdom

Radiation oncologists have a fundamental role in the design of clinical trials where radiotherapy is included as one of the treatment modalities. They should be represented on the trial management committee and a formal quality assurance programme is essential in order that any results can be interpreted confidently as due to differences in trial arms rather than variation in radiotherapy delivery and the results can be applied accordingly. Several steps can be identified in the development and implementation of a clinical trial.

These include protocol development which should include detailed radiotherapy technique and formal permission for trial activity from relevant regulatory and ethics committees which will often include estimates of risk from radiation exposure patient entry and data collection. In each if these involvement of the radiation oncologist is essential.

There are various components to a formal radiotherapy quality assurance programme which include pre-trial evaluation and ongoing monitoring during trial participation. The extent of quality assurance will vary from trial to trial depending upon the role of radiation in the trial question and the complexity of the radiation to be delivered. Departmental QA is essential to ensure rigorous geometric and dosimetric processes and a 'dummy run' for the entire radiotherapy process from physician outlining to delivery is recommended for new or complex radiotherapy techniques.

Throughout the development and execution of a clinical trial it is clear that input from radiation oncology is essential.

SHOULD PROSTATE CANCER PATIENTS UNDERGO PROSTATE MULTIPARAMETRIC MAGNETIC RESONANCE IMAGING (MP-MRI) FOR STAGING AND TREATMENT PURPOSES?

GOMEZ DE ITURRIAGA PIÑA, A.

Hospital Basurto. Vizcaya

Introduction

Traditional methods of evaluating prostate cancer like digital rectal examination, transrectal ultrasound, sextant biopsies and prostate specific antigen (PSA) have important limitations to predict indolent tumors and aggressive tumors.

Because of these limitations, the accuracy of Magnetic Resonance (MR) in the study of local extension of prostatic cancer has been studied, with encouraging results. And its role in prostate cancer management is expanding as improved MR techniques, such as multiparametric MR (mp-MR) and spectroscopic imaging become commonplace, and as experience grows with interpretation of such MR image.

Discussion

Both prostate MR images and spectroscopy can evaluate tumor aggressiveness. It has been observed that some parameters obtained with MR systems such as ADC (Apparent Diffusion Coefficient) and the T2 relaxation time; correlate with tumor cellularity and Gleason score.

Today, the fundamental use of this diagnostic tool focuses on macroscopic local staging of the disease. This is important in order to know about the existence of prostate tumor nodules, whether unilateral or bilateral and, more important, to establish whether there is extraprostatic extension or not, since the presence of extension (stages cT3-T4) confers a poor prognosis of the disease. MR can also detect in the same procedure nodal drainage areas and explore the pelvic bone structures to rule out nodal or bone metastases.

The probability of extraprostatic extension (EPE), infiltration of seminal vesicles, and pelvic lymph node involvement can be determined clinically with the use of nomograms, such as Kattan and Partin. These nomograms estimate pathological stage based on pretreatment PSA level, clinical stage and Gleason score in the biopsy. Although the nomograms do not include the results of radiological examinations, MR can contribute greatly to improving the ability of the nomograms to predict the presence of EPE, infiltration of seminal vesicles, and lymph node metastasis. Patients who would benefit most, are those with intermediate or high risk.

Despite an important role of MR on local staging of the disease, several studies that have investigated the value of MR prior to radiotherapy have consistently shown that MRI findings predict biochemical control.

Novel high precision irradiation techniques for prostate cancer such as HDR brachytherapy and Stereotactic Ablative Radiotherapy (SABR), offer several advantages in terms of dose conformation, and allow administering higher doses to the target, adjusting the isodoses to the prostate while keeping adjacent organs such as the urethra and rectum within tolerance.

This extreme precision requires a proper local staging of prostate disease for an excellent technique performance, and techniques used today (as transrectal ultrasound) have not been able to provide more useful clinical information than the obtained by digital rectal examination.

Conclusions

The benefits of mp-MRI include early detection of PCa; improved biopsy accuracy, depiction of tumors missed on biopsy; the ex-

clusion of clinically significant disease to enroll patients in active surveillance; surgical, radiation treatment; and focal therapies planning and evaluation of response to therapies.

13:30-14:30

SEOR'S MEMBERS PUBLICATIONS AND COMMUNICATIONS WITH MAJOR IMPACT ON THE LAST TWO YEARS

RELATIONSHIP AND USEFULNESS OF RT AND IMMUNOTHERAPY

ILLESCAS VACAS, A.

University Hospital Virgen Macarena. Sevilla

Ionizing radiation may exert interesting effects over tumor microenvironment, increasing the effectiveness of patient's antitumor immune responses even at distant sites.

It seems that one of the main effects of radiotherapy (RT) is to unleash an effective immune response through the induction of danger signals called "alarmins" with immunogenic properties. Various mechanisms with different peptides, cytokines, and cells are involved in this process: calreticulin, high-mobility group box, NKG2D receptor, upregulation of death receptor, release of tumor antigens and pro-inflammatory cytokine.

We have to highlight that those immune-modulating effects of RT are influenced by several factors, such as the dose of radiation.

In addition, pre-clinical models have elucidated that dendritic cells loaded with tumor antigens could migrate toward the draining lymph nodes. This process leads to an activation of T cells that had not been previously exposed to specific tumor antigens, spreading the immune response against tumor. Once the citotoxic T cells (CTLs) are in the tumor, RT may boost the anti-tumor immune response by the death of new tumor cells.

These radiation-induced changes in the tumor microenvironment transforming the irradiated tissue into an immunogenic hub, which serves to the immune system as a source for the identification of tumor cells. Therefore, the immune system of the patient can recognize tumor cell lines out and away from the irradiated zone (abscopal effect).

To date case reports related to the abscopal effect are relatively scarce. Nowadays, this likelihood is getting higher, due to the addition of immune drugs to RT that might lead to a better recognition of remote tumor cell by the immune system.

Recently, some well-documented case reports have been described about regression of non-irradiated metastases from melanoma after receiving palliative RT combined with anti-CTLA-4. Furthermore, in recent years preclinical studies have reported successful results by combining local radiation and immunotherapy to enhance the immune response. Besides preclinical models, clinical studies have shown synergism between RT and immunotherapy, for example with GM-CSF, ipilimumab, fresolimumab and imiquimod.

Nowadays, several clinical trials are ongoing exploring the immune consequences of RT, especially with immune checkpoints, and they probably will shed more light to this interesting topic.

POSITION OF RADIOTHERAPY IN LUNG CANCER

TOVAR MARTIN, I.

University Hospital Virgen de las Nieves. Granada

Lung cancer remains a major health problem in our society. The role of radiotherapy (RT) in the treatment of lung cancer is adequately established in clinical practice guidelines.

Non-small cell lung cancer (NSCLC) represents 80% of lung cancer cases, and its clinical management depends to a high degree on the tumor burden at the time of diagnosis as measured by the stage classification system. According to clinical evidence accumulated over the past few decades, optimal outcomes are obtained if tumors are treated in early stages, when surgery is more feasible and where radiotherapy techniques like stereotactic body radiotherapy (SBRT) are obtained promising results, as effective as surgery. Surgery at the time of diagnosis is possible in 15-25% of patients, usually in those with stages I or II and sometimes with IIIA. When surgery is not possible (e.g., in patients with stage IIIB and sometimes with stages II and IIIA), there is a strong consensus that different combinations of chemotherapy (CT) and radiotherapy should be administered in a multidisciplinary approach. In most patients with stage IV, the recommended treatment is CT, which is associated with RT for palliative and symptom control purposes. At the time of diagnosis, 30-50% of NSCLC patients have stage III disease and 40% stage IV. The standard approach in small cell lung cancer (SCLC) is combined CT and RT if the disease is limited, generally followed by prophylactic cranial irradiation. In cases of extended disease, CT is the therapy of choice, reserving RT for palliative treatment and symptom control.

RT alone or in combination has proven to be effective in lung cancer, but may be underutilized. It has been calculated that 45-55% of patients can benefit from RT in their initial treatment and a further 15% during the course of the disease. It is possible to determine the amount of benefit that RT may provide as a function of the stage and histological type (mainly NSCLC or SCLC) of lung cancer. Reports on clinical practice have revealed that the use of RT in lung cancer is less frequent than could be expected.

Our group assessed the radiation rate for lung cancer in Andalusia in 2003 (VARA I study) and in 2007 (VARA II study) and found that initial RT was received by 20% of lung cancer patients, indicating that it was not administered to 25-35% of eligible patients. The 20% radiation rate found in our study represents an underutilization of RT that needs to be addressed. Survival gains attributed to exclusive RT range from 1.8 months in patients with advanced disease and poor general health status to 14-18 months in NSCLC patients who are inoperable due to medical problems. According to the difference between recommended and observed radiation rates in our population, the failure to administer RT to the NSCLC patients who may have benefited represents a total survival loss of 3038-3553 months (253-296 years). The underutilization observed may be partly explained by a deficit in resources, compromising accessibility to the therapy, differences in clinical decision-making.

RT has an adequately established role in lung cancer treatment, and its underutilization should be a matter of concern, given its negative and measurable impact on the survival of patients. We need to facilitate the accessibility to RT and to involve to radiation oncologists in the multidisciplinary tumor boards to enhance appropriate evidence-based decision-making.

16:00-17:30
GYNECOLOGY

EVIDENCE IN THE TREATMENT OF CERVICAL CANCER

VILLAFRANCA ITURRE, E.

Hospital complex. Navarra

Cervical cancer is the fourth most common cancer in the world, but is declining in our country, after the screening programs. Persistent HPV infection is the principal risk factor. Although the FIGO only recommend conization, cystoscopy or rectosigmoidoscopy, radiologic studies with CT and specially RM, PET-CT or surgical node staging are very useful to decide the treatment. The primary treatment of cervical cancer is either surgery or radiotherapy.

Surgery

Microinvasive disease, stage IA1 with no lymphovascular invasion (LVSI) may be conservatively with cone biopsy for preservation of fertility. In stage IA1 with LVIS, is a conization or simple hysterectomy with lymphadenectomy or sentinel mapping.

Radical hysterectomy with pelvic lymphadenectomy is the most common treatment in stage IA2, IB1 and IIA1, via laparotomy or laparoscopic. In selected patients with stage IA2 or IBA<2 cm, radical trachelectomy with pelvic lymphadenectomy is a fertility option.

Advanced stage is treated with chemoradiation. Selected cases of Stage IIB can be treated with neoadjuvant chemotherapy followed of radical hysterectomy, but some of these patients also can need adjuvant radiation.

Recurrent or persistent pelvic disease can be treated with pelvic exenteration plus intraoperative radiotherapy or brachytherapy. This is a complex procedure, so should be performed in centers with high lever of expertise.

Radiotherapy

Volume of radiotherapy should cover gross disease, parametria, uterus and vagina, at least the proximal third; pelvic nodes include external iliac, internal iliac, obturador and presacral. If pelvic nodes are positive in lymphadenectomy or in radiologic studies, is recommended extended field with paraortic nodes up the renal vessels.

It is recommended a dose of 45 Gy and conformal nodal boost of 10-15 Gy for residual gross nodes. IMRT is very useful for increase the dose in nodal boost, and decrease the toxicity. But it is very important to be sure of the reproducibility of the treatment, in relation to the organ movement and deformation of the uterus with the response of the tumor.

Concomitant chemotherapy during the radiation with cisplatin alone or with fluouracil is a standard treatment. After a recent Cochrane Review, there is no evidence about the benefit of adjuvant chemotherapy.

The brachytherapy is a component of definitive treatment with external radiotherapy. But in stage IA2 is the only necessary treatment. The most common implant is the endocavitary, with an intrauterine tandem and ovoids, ring or cylinder when the vagina is affected. In the cases with persistent parametrial disease, is necessary an interstitial approach with a perineal template or the ovoids or ring with needles. 3D- image guide brachytherapy with RMI or CT is the preferred option by the GEC-ESTRO and the ABS. The guidelines recommend doses in the CTV-HR of 80-85 Gy2.

In the cases of posthysterectomy radiation, is recommended in cases with tumors higher than 4 cm, stromal invasion >50%, Grade III, lymphovacular space invasion and next surgical margins. In cases with affected parametrial, vaginal margin or positive nodes, adjuvant chemoradiotherapy is the standard treatment.

CONTROVERSIES: CONVENTIONAL PLANNING 3D OPPOSITE TO PLANNING WITH IMRT IN THE THERAPEUTICS OF CERVIX'S CANCER

RODRIGUEZ VILLALBA, S.

Clinical Benidorm. Alicante

Intensity Modulated Radiotherapy (IMRT) has proved a reduced irradiation of organ at risk, bone marrow and bowel compared with the AP-PA and four-field box technique.

The well kwon interfracction movement of the cervix and utherus, becomes difficult the volume margins definition. Because that, there are a differences between planned and deliver dose probably affecting the clinical outcomes. So, reproducibility represents a major factor for treatment success. The accuracy at the patient set-up and treatment delivery are critical during the treatment, mainly when IMRT is used.

IMRT, it is recommend to be used by guidelines, when the paraaortic lymph nodes have to be irradiated or it is necessary increase the dose over gross tumour. But it should not be used as an alternative to brachytherapy. Conventional 3D plus brachytherapy remains as optimal approach in other scenarios.

RTOG trial (Time C Trial) is the only one study comparing IMRT vs 3D in post-hysterectomy patients.

Literature and guidelines will be presented and discussed.

CRUCES UNIVERSITY HOSPITAL EXPERIENCE IN THE TREATMENT OF CERVICAL CANCER

CASQUERO OCIO, F.

University Hospital Cruces. Vizcaya

Objective

Results of radical treatment of carcinoma of the uterine cervix with external radiotherapy and brachytherapy high dose rate and side effects in relation to the dose administered and planning with 2D or 3D are analysed.

Methods

88 patients with a mean age of 60 years (32-89) were analysed. The distribution of the patients according to TNM stage was as follows: Stage I (15%), II (41%), III (32%) and IV (12%). Regarding histological types: Epidermoid (86%), adenocarcinoma (8%), Adeno -squamous (3.5%), Undifferentiated (2.3%).

External beam radiotherapy was administered with four fields (box) and AP-PA fields in 91% and 9% of the cases, respectively. The mean dose administered to the pelvis was 4694 cGy (with a median dose of 4500 cGy). The median parametrial dose was 1000 cGy. The high rate brachytherapy was performed by MicroSelectron with a median of 5 applications per patient (4-6) and 500 cGy (450-650) per application. The dose calculation was performed with 2D planning and 3D planning (CT/MRI) in 20% and 80% of cases, respectively

Concomitant chemotherapy was administered in 74% of cases (cisplatin 40 mg/m^2/week).

Acute and chronic toxicity was measured according to EORTC-RTOG criteria.

Results

The mean follow up of the entire cohort was 62 months, The median duration of treatment was 63 days (32-89).

The median BED 10 was 94 (83-105), median rectal BED 3 was 125 (109-142) and median bladder BED 3 120 (86-147).

Equivalent Doses to 2 Gy per fraction (EQD2) to tumor, rectum and bladder for patients treated with 2D planning were: 78 Gy, 68 Gy, and 68 Gy respectively. For patients treated with 3D planning the EQD2 to High-risk PTV, rectum (2 cc), bladder (2 cc) and sigmoid (2 cc) were 86 Gy, 61 Gy, 71.4 Gy, and 60.3 Gy respectively.

For the subgroup of patients treated with 3D-planning PTV volume was 54.2 cc in the planning CT and 43.5 cc in the planning MRI ($p<0.02$). The percentage of prescription dose administered for the rectal ICRU point was lower in 3D-planning compared to 2D-planning: 60% vs.72.8% ($p<0.01$). No significant differences were found in ICRU bladder point 68.2% vs. 64.8% ($p>0.05$).

Acute G1 and G2 gastrointestinal (GI) toxicity was found in 51 and 32% of patients, and G 3-4 in 2%. Acute Genitourinary (GU) toxicity G1 and 2 in 64 and 6% of patients, and grade 3-4 in 3.1%.

Chronic G1 and G2 GI Toxicity was in 8 and 7%, and G 3-4 in 2%. Chronic G1 and 2 GU toxicity was 8% and 3.4% and G 3-4 in 2.3%.

Bone insufficiency fractures were found in 10.2% and 3.4% of patients developed avascular necrosis or other fractures

Cause-Specific survival for the entire cohort was 61.4% (54/88) and Disease-Free survival was 60.4%. The 5 and 10-year actuarial Overall-survival (OS) for the whole cohort was 60.7 and 53.2%. When stratified by staging group, patients with Stage-I presented a 5 and 10-year (OS) of 82% and 64%, stage-II 67% and 63%, stage-III 52% and 46% and stage-IV 32% and 0% respectively.

Conclusions: Patients with cervical carcinoma treated with a multimodal approach of EBRT, HDR-BT and concurrent chemotherapy presented OS and DFS rates consistent with previously published literature. 3D (MRI-CT) planning allows increasing the dose to the target volume while reducing doses to Organs at risk.

16:00-17:30

DIGESTIVE TUMORS

ESOPHAGEAL AND GASTROESOPHAGEAL JUNCTION CANCER

VALENCIA JULVE, J.

Clinical University Hospital Lozano Blesa. Zaragoza

Esophageal cancer is the third most frequent digestive tumor and one of the most lethal, it represents the sixth most common cause of cancer-related death. Histologically there are two main subtypes: squamous-cell carcinoma and adenocarcinoma which incidence has risen in the developed world. Aside from histology and staging, prognosis and treatment are given by tumor localization within the esophagus, as we shall see later.

While the basic diagnosis tests are still the upper gastrointestinal endoscopy with biopsy and Thoracic-Abdominal CT scan, the wider use of endoscopic ultrasound (EUS) and PET- CT has managed to significantly improve the diagnostic accuracy and tumor staging and as well as the possibility to evaluate the response obtained after neoadjuvant treatments.

Once the esophageal cancer diagnosis is confirmed, and its histology and localization are established, there are many options of treatment depending of the TNM staging. For the most incipient and lower grade lesions the endoscopic treatment is widely accepted, for being the most suitable, whereas elective surgery has been relegated as a treatment exclusively applied to stage T1b that has no lymphadenopathy. There are several clinical studies promoting the use of chemotherapy or radiochemotherapy previous to surgery or even as an exclusive radical treatment from stage T2 or T1b with extension to regional lymph nodes. In such cases obtaining pathologic complete response has proven to be an independent prognosis factor to achieve an improvement in survival rates.

Thereby, three meta-analysis have proven that radiochemotherapy followed by surgery reduces the three-year mortality, and improves local control of the disease, despite the conflicting results of various randomized clinical trials in this regard. However, in 2013 the CROSS trial, that associated carboplatin and placlitaxel with 41.1 Gy followed by subsequent surgery after 6 to 8 weeks in stages T2-4 or affected nearby nodes, obtained a remarkable improvement in disease free survival length, global survival and R0 resection rates. From this trial on, and given that it included both adenocarcinoma andsquamous-cell carcinoma and even gastroesophageal junction tumors, we can consider this treatment as the standard at this moment setting aside other strategies, such as perioperative chemotherapy, for purely gastric tumors or gastroesophageal junction tumors Siewert III.

For those patients who refuse to undergo a surgery, are medically inoperable or have nonresecable tumors, due to localization in cervical esophagus or to the staging (T4b), the treatment of choice becomes radiochemotherapy alone whit a schedule that includes 5-FU or taxanes up to a maximum dose of 50.4 Gy as stablished by Minsky in the INT0123 trial.

For other cases that have been substaged prior to the surgery or those with affected surgical margins that have not been previously treated, an adjuvant treatment with chemoradiotherapy has to be pondered, being the McDonald proposed schedule valid in this case.

Special mention should be given to the gastroesophageal junction carcinoma that in recent years has been included, concerning its prognosis and treatment, with the distal third esophageal carcinoma when it comes to types Siewert I and II, and with the gastric carcinomas if Siewert III type (treated with surgery followed by chemoradiotherapy in locally advanced stages in the McDonald schedule).

Therefore, from our point of view and in the light of the published studies, we believe that chemoradiotherapy alone in selected cases, preoperative whenever possible or postoperative in substaged tumor or with affected surgical margins, becomes fundamental in the treatment of locally advanced esophageal carcinoma and gastroesphageal junction carcinoma.

CONSERVATIVE APPROACHES IN RECTAL CANCER: DOSE ESCALATION IN PREOPERATIVE RADIATION, ENDORECTAL EXCISION, WAIT AND SEE STRATEGY

CEREZO PADELLANO, L.

University Hospital La Princesa. Madrid

In the past decades studies have shown that the risk for recurrence after resection of rectal cancer is substantially reduced with the total mesorectal excision (TME). Additionally, neoadyuvant chemoradiation has improved local tumor control and, in some studies, survival. Downstaging of the disease has been significantly improved and pathological complete response rates now range between 15% and 30%. Several ongoing strategies are applying this previous experience with preoperative treatment to the conservative management of rectal cancer, particularly for

distal tumors where the standard surgery would imply the amputation of the sphincter.

Individualization of treatment taking into account characteristics such as age, comorbidity, stage and location of the tumor might provide a better outcome in terms of local control and quality of life. Reliable preoperative imaging is essential for a differentiated treatment according to risk factors. Functional imaging with dynamic contrast enhanced MRI and PET-CT may increasingly aid the decision-making process. With the aid of diffusion MRI it is possible to subdivide cT3 rectal cancer in cT3, T3b, T3c and T3d according to the depth of penetration beyond the muscularis propria, and the distance to the mesorectal fascia. This subclasification can help us to decide which patients would not require preoperative treatment, and which ones, in the other side of the spectrum, would benefit from a dose escalation to reduce the risk of local recurrence. Following neoadjuvant treatment, it is also possible with diffusion MRI to define quantitative and qualitative response, predict histopathologic TN downstaging, and define a radiologic tumor regression grade, without the potential morbidity of biopsies. Where downstaging/downsizing is confirmed, modification of the initial treatment plans can be made.

Intensifying treatment of rectal cancer usually results in major downstaging without increasing treatment-induced morbidity if the appropriate technique is used. With the evolution of IMRT, doses in the range of 55-60 Gy can be given to the primary tumor by means of an integrated boost, while excluding small bowel and the anal canal where possible. Also, endoluminal brachytherapy procedures can be performed in some cases of distal rectal cancers, as a form of tumor dose intensification.

Patients with pathological complete response after chemoradiation have better long -term outcome, indicating a favorable biological tumor profile with less propensity for local or distant recurrence and improved survival. A good clinical response offers the opportunity to perform a sphincter-sparing surgery in distal tumors, allowing either a local excision or even a nonoperative approach in a patient who achieves a complete clinical response. Preoperative radiation, followed by transanal endoscopic local excision, can be considered a definitive therapeutic option in patients with early stage, T1 or T2, distal rectal cancer, less than 4 cm in size, 2 cm away of the anorectal ring and without invasion of the external sphincter. In this selected group, local excision offers excellent results in terms of survival and recurrence rates. In other early stage distal tumors, an intersphincteric dissection can be performed after the preoperative radiotherapy.

Retrospective series from Brazil and from The Netherlands have highlighted the rationale of "watch and wait" suggesting there is no survival benefit when patients who achieve a clinical complete response undergo radical surgery. A clinical complete response eight to ten weeks after chemoradiation has been defined as absence of residual palpable or visible tumor, absence of suspicious lymph nodes on MRI, no residual tumor at endoscopy or only a small residual ulcer or scar and negative biopsies from the scar. Adopting a non-operative strategy in patients who achieve complete tumor regression will avoid the need for a stoma and the permanent sequelae of an abdomino-perineal resection in patients with low rectal cancer. However 20% of them may fail in the first year and will need salvage surgery. Therefore, this strategy remains experimental and close follow-up with digital examination, endoscopies and serial MRI is mandatory. Clinical trials are ongoing testing the wait and see policy. In this context, the age and the preferences of the patient should be taken into consideration.

In the future, molecular biology and genome data may offer the ability to predict which patients will have more or less benefit from preoperative treatment, and to design a molecular adaptive radiotherapy.

ADJUVANT AND NEOADJUVANT THERAPY IN PANCREATIC CANCER

CARDENES, H.

Indiana University School of Medicine. EE.UU.

Adjuvant therapy

Approximately 48,960 people develop exocrine pancreatic cancer each year in the United States, and almost all are expected to die from the disease. The majority of these tumors (85%) are adenocarcinomas. Surgical resection offers the only chance of cure for pancreatic cancer, but only 15-20% of cases are potentially resectable at presentation. Furthermore, prognosis is poor, even for those undergoing complete (R0) resection. Given the high rates of both systemic (>80%) and local (>20%) recurrence after surgery alone, systemic chemotherapy, radiation therapy (RT), and combined approaches (chemoradiotherapy) have been used following surgical resection in an effort to improve cure rates. Although adjuvant chemotherapy has been associated with an improvement in overall survival, the benefits of radiotherapy remain controversial.

Based on the National Comprehensive Cancer Network (NCCN) and the European Society for Medical Oncology (ESMO), all patients who have undergone resection of an exocrine pancreatic cancer (including those with resected T1N0 disease should be offered adjuvant therapy. Adjuvant chemotherapy has been shown to improve overall survival by reducing systemic recurrence, with fluoropyrimidines and Gemitabine both demonstrating similarly beneficial effects. Adjuvant RT, which is often given with sensitizing doses of chemotherapy, reduces local recurrences but there are no high-quality studies demonstrating an effect on survival that is independent of systemic chemotherapy. There are few randomized trials that have directly compared adjuvant chemotherapy with or without concomitant chemoradiotherapy.

Most European clinicians advocate chemotherapy alone, emphasizing the survival benefit of chemotherapy alone as seen in the German Charité Onkologie (CONKO) 001 trial, the lack of a significant survival benefit with chemoradiotherapy in the European Organization for Research and Treatment of Cancer (EORTC) trial, and the detrimental impact of chemoradiotherapy on survival seen in the European Study for Pancreatic Cancer (ESPAC)-1 trial. The most recent (2012) guidelines for treatment of pancreatic adenocarcinoma from ESMO suggest that chemoradiotherapy in the adjuvant setting should only be undertaken within the context of a randomized controlled trial This is in contrast to NCCN guidelines, which suggest that either 5-Fluorouracil (FU)-based chemoradiotherapy plus systemic Gemcitabine or chemotherapy alone are acceptable options for adjuvant therapy. Similarly, the Japanese approach also includes chemotherapy alone. However, for Japanese patients, oral therapy with S-1, where available, represents a preferred alternative to Gemcitabine monotherapy given the result of a randomized trial demonstrating therapeutic non-inferiority and better tolerability for S-1.

Neoadjuvant therapy

Only 15-20% of patients with pancreatic cancer have potentially resectable disease at diagnosis; approximately 40% have distant metastases, and another 30-40% has locally advanced "borderline" or unresectable tumors. The disease is categorized as "borderline resectable" when there is focal tumor abutment of the superior mesenteric artery (SMA), encasement of the gastroduodenal artery up to the hepatic artery, or involvement of the superior mesenteric vein (SMV)/portal vein that is potentially resectable and reconstructable. For these patients with potentially resectable disease, the high likelihood of an incomplete resection

has prompted interest in strategies to "downstage" the tumor prior to surgical exploration using chemotherapy with and without RT (neoadjuvant therapy). This approach is consistent with guidelines from the NCCN and ESMO. The best regimen to use for neoadjuvant therapy in this setting is not established. Several regimens have been reviewed in small prospective trials and retrospective reports, most of which include chemoradiotherapy. For patients treated with initial combination chemotherapy, the specific contribution of radiotherapy for both responders and nonresponders has not been addressed. The use of neoadjuvant chemoradiotherapy in pancreatic cancer has been associated with high rates of tumor fibrosis in pathologic specimens and higher rates of an R0 resection, which likely contribute to the low rates of local recurrence seen in patients undergoing pancreatectomy after completion of neoadjuvant chemoradiotherapy. However, the relative contribution of chemotherapy and RT to these results is unknown. At some institutions using upfront FOLFIRINOX or Gemcitabine, chemoradiotherapy is pursued following chemotherapy only in those patients who remain unresectable by radiologic criteria after a maximal response to chemotherapy.

In this presentation the role of adjuvant and neoadjuvant therapy in pancreatic cancer will be reviewed.

Saturday, june 6

09:00-11:00

BREAST CANCER

IS RADIOTHERAPY FOR PATIENTS WITH BREAST CANCER COST-EFFECTIVE?

BAYO LOZANO, E.

Hospital Juan Ramón Jiménez. Huelva

Innovative treatments in breast cancer may improve patients' survival and quality of life, but such improvements may come at a significant economic cost. The cost of treatment has increased dramatically in recent years and has promoted an intense debate not only focused on the costs of treatments but also on their relatively modest benefits in some cases. Resources are limited and decisions about which services should and should not be covered are inevitable.

Therefore, in recent years, the economic evaluation of health technologies has become an important tool for decision makers when formulating strategies to prioritize the allocation of health resources and when evaluating new technologies for approval.

The method most commonly used to evaluate the health benefits of medical interventions relative to their costs is cost-effectiveness analysis (CEA). This approach compares the incremental costs and the additional health benefits of a new treatment with those associated with an old standard treatment. The result is the incremental cost-effectiveness ratio (ICER). In a CEA, the effectiveness of an intervention is defined in nonmonetary units, such as lives saved, or life-years saved. Survival outcomes may be adjusted to reflect quality of life, giving a measure of effectiveness known as quality-adjusted life-years (QALY). QALY are a preferred metric for CEAs because they reflect the impact of an intervention on both morbidity and mortality and because they are comparable across treatment modalities and disease areas.

Radiotherapy (RT) is no exception. In the last decade, the steady increase of technological development has led to an important evolution in treatment strategies, both external radiotherapy and brachytherapy. These sophisticated techniques however require greater quality assurance and inevitably come with a higher workload and larger investment in infrastructure.

The question is if these treatments provide value sufficient to justify their additional cost. CEAs and other methods can provide useful information about the comparative value of different medical interventions, but they do not inherently tell us how much is too much to spend or how much we should be willing to pay for health benefits.

Where to draw the line is an issue still unresolved. Several institutions, such as the National Institute for Health and Clinical Excellence (NICE) in the UK, Swedish Pricing and Reimbursement board, Pharmaceutical Benefits Advisory Committee in Australia or College voor zorgverzekeringen (CVZ) in The Netherlands, have adopted threshold values in the process of optimizing the allocation of health-care resources. However, this threshold varies considerably from one country to another, and there is no agreement on the criteria for establishing.

Breast cancer is responsible for the largest share of cancer-related spending, with an estimated 13% of all cancer-related spending in 2010. The distribution of costs in the year after diagnosis by type of therapy was 25% for breast cancer surgery, 15% for chemotherapy, 11% for radiation therapy, 18% for other hospitalizations, and 31% for other services.

This paper's main objective is to answer the following question: Is radiotherapy for patients with breast cancer cost-effective? The answer is not easy. As demonstrated by the wide range of published ICER estimates, some breast cancer interventions offer substantial value, whereas others offer only a modest benefit at a very high cost. Furthermore, it is also important to note that the cost-effectiveness of an intervention may be strongly influenced by the characteristics of the patient population, such as risk of recurrence or age, and the way in which the intervention is applied.

Although few rigorous studies have analyzed the cost effectiveness of radiotherapy in breast cancer, we present the most relevant findings of these studies:

— RT following conservative surgery is cost effective, even in older women.
— Boost is not cost effective using a threshold of $50,000 per QALY.
— Post-mastectomy RT is cost-effective, but RT over mammary internal chain and supraclavicular area was only cost effective when evaluated over a long time period in tumours with a slow natural history and systemic treatment for relapse.
— Addition of RT following conservative surgery for patients with ductal carcinoma in situ should not be withheld because of concerns regarding its cost-effectiveness.
— External beam-partial breast irradiation is cost effective versus whole breast irradiation, but MammoSite-partial breast irradiation is not and is unlikely to be cost effective unless quality of life the after MS-PBI proves to be superior.

However, certain risk factors or associated systemic treatment can complement these findings.

NEW TECHNOLOGIES: INTRAOPERATIVE RADIATION THERAPY IN BREAST CANCER

PINAR SEDEÑO, B.

University Hospital of Great Canary Doctor Negrín. Las Palmas de Gran Canaria

Breast conserving surgery (BCS) followed by whole-breast irradiation (WBI) has been established as a standard therapy for

early-stage breast cancer. More than 85% of all recurrences in breast cancer patients occur within the primary tumor bed and special attention should be paid to this area of risk. Accelerated partial breast irradiation (APBI) is a novel approach that delivers radiation locally to this tissue at the highest risk of recurrence. Potential advantages of APBI are its ability to decrease treatment time and to reduce radiation dose to normal breast tissue and adjacent organs. This brief course of radiation is exclusively confined to the tumor surrounding tissue (tumor bed) either during surgery or after surgical procedure. There are several technical options for APBI, including 3D-conformal external beam radiotherapy, interstitial brachytherapy and intraoperative radiotherapy (IORT).

The advantage of a very short radiation time or the integration of the complete radiation treatment into the surgical procedure is particularly attractive.

IORT with linear accelerators (IOERT)

— As a boost: The ISIORT Europe Pooled Analysis (BIO-Boost): Starting in 2005, a collaborative pooled analysis on the outcome of a 10-Gy-IOERT-Boost prior to a 50 Gy WBRT has been repeatedly performed among 6 member institutions of the ISIORT Europe. 1220 patients were enrolled and after a median follow-up of 6 years, the published results in terms of local control, disease specific survival and overall survival are higher than 90%. It seems that prolonged onset of WBRT after IORT was not associated with an increase in local failure, indicating the high value of a "tumor holding effect" of a single IOERT booster dose.

— Full-dose exclusive IOERT: ELIOT concept: 1305 patients were randomized to receive either a single dose of 21 Gy intraoperative electron beam therapy, prescribed to the 90% depth or to 50 Gy WBRT and a 10 Gy boost in 6 weeks. In a subset of low-risk women (ASTRO suitable, Luminal A), IOERT could be effective with a recurrence rate of 2% at 5 years. Single fraction IOERT patients should be treated under strict institutional protocols until long-term results are available.

IORT with low-energy X-ray (Intrabeam®)

TARGIT-A is a non-inferiority international multicenter randomized trial, in which 3451 patients were randomized to standard WBRT or to TARGIT-A (intraoperative delivered single dose of 20 Gy prescribed to specific Intrabeam® applicator surface). This technique supposes a risk adapted procedure, because patients with postoperative added high risk of recurrence factors, could receive adjuvant external beam radiation therapy (EBRT), without variation in the IORT dose. The results demonstrate to be non-inferior in the TARGIT-A arm compared with EBRT arm in terms of local control and overall survival, overall in those patients treated during primary surgery (pre-pathology subset). IORT with Intrabeam® system presents advantages comparing to IOERT technique, it is a more realistic approach, with less tissue manipulation of the tumor bed, translated in a more feasible and comfortable procedure during BCS. Meanwhile long-term results are available, patients should be treated under strict institutional protocols also.

APPLICATION OF MOLECULAR TOOLS IN DECISION-MAKING

ALGARA LOPEZ, M.

Hospital Parc de Salut Mar. Barcelona

Irradiation of lymph node areas in breast cancer patients, especially in early stages of the disease, is an issue under discussion. Published studies do no describe exactly the irradiated nodal volumes. For this reason the management of nodal areas remains controversial in the community of radiation oncologists.

The recommendation to irradiate axillary lymph nodes is clearly indicated in patients with more than three involved nodes. In these cases, after lymphadenectomy, the standard volumes to irradiate include supraclavicular and axillary level lII areas. On the other hand, axillary levels I and II, are reserved for cases of significant burden of axillary involvement, or in patients who have not undergone lymphadenectomy or if this was an insufficient one (inferior to 10 lymph nodes resected). Also, Irradiation of internal mammary chain is performed when pathologic involvement of internal mammary lymph nodes is present. However, when only 1 to 3 nodes are involved, there is no unanimity on the radiotherapy recommendations, despite several studies have clearly shown the survival improvement in irradiated patients. The Canadian trial NCIC-CTG MA20, including high risk patients with both negative or positive lymph nodes (most of them with 1 to 3 involved nodes), showed that local irradiation with or without regional lymph node irradiation improved disease-free survival, as well as loco-regional and distant disease control. Moreover, a systematic review including more than 20,000 patients from 45 studies concludes that breast irradiation reduced loco-regional relapse, even in patients without involved lymph nodes.

The therapeutic value of axillary lymphadenectomy has been questioned since long but especially after publication of the ACOSOG Z0011 trial. As a result, several clinical practice guidelines, including prestigious ones as those of National Comprehensive Cancer Network, do not recommend lymphadenectomy. Furthermore, a tremendous shift in daily practice towards withdraw of axillary lymphadenectomy has taken place in several cases with consequences on the indication of irradiation of node areas.

Therefore, the amount of nodal volumes to be included in the irradiation treatment of early stages of breast cancer is under discussion, particularly in patients not submitted to axillary lymphadenectomy despite involvement of sentinel lymph nodes. In most cases, breast irradiation with tangent fields implies certain "incidental" of axillary level I, and also in some cases of the level II. For this reason, some groups have decided to avoid intentional irradiation of these axillary areas, while others advocate irradiating them intentionally.

In order to ascertain the need of complementary irradiation according to node involvement burden, newer approaches are under investigation. One of molecular tools that may be useful is the One-Step Nucleic Acid Amplification (OSNA) assay (Sysmex Corp., Kobe, Japan). This technique allows a readily and complete analysis of sentinel lymph nodes and provides a pretty good quantification of CK19 tumor cell marker in the mRNA of the axillary node. The result, being expressed as "Total Tumor Load" (TTL), indicates a discrete number of copies per microliter and has shown the ability to discriminate among macrometastasis, micrometastasis or negativity, and to predict the probability of non-sentinel lymph nodes. According to previous results, a TTL under 15,000 copies is associated with an 85% probability of non-involvement of non-sentinel axillary lymph nodes.

It is possible that in cases with low axillary involvement intentional irradiation could be avoided. In order to demonstrate this hypothesis we have started the OPTIMAL trial (www.clinicaltrials.gov/ct2/show/NCT02335957?term=osna&rank=7), which pretends to investigate the non-inferiority of incidental versus intentional irradiation of axillary nodes in patients with axillary involvement of 250-15000 copies/µl. This multicenter trial must help us to elucidate the need of node areas irradiation by combining with reliable information about the tumor load involvement in axillary nodes.

09:00-11:00

LUNG CANCER

WHAT EVIDENCE HAVE ALTERED FRACTIONATION IN LUNG CANCER ? ISOTOXIC HYPOFRACTIONATION AND HYPERFRACTIONATION

OLAY GAYOSO, L.

Central University Hospital of Asturias. Oviedo

Altered fractionation either by hipo- o hyper-fractionated radiotherapy appears to produce improved survival of lung cancer as compared with conventional schedules.

The main objective of altered fractionation is to overcome the proliferation of neoplasm cells by changing the dose per fraction in order to increase the total dose or by reducing the total treatment time or combining both.

Altered fractionation studies includes hyperfractionation, accelerated RT, hyperfractionated accelerated RT or hypofractionation.

A recent meta-analysis evaluated 2000 patients in ten trials, and concluded that modifying tha radiotherapy schedule by accelerated RT o Hyper fractionated radiotherapy, or both, resulted in an increase of overall survival, with an increased oesophagitis risk. There are only a few studies to address hypofractionated radiotherapy.

In this communication, there will be an exhibition of the most important studies of alterations of fractionation that have been published. Topic will also be addressed from the point of view radiobiologico, with the introduction of the most innovative concepts in relation to hyperfractionation e hypofractionation.

Hyperfractionation

In what refers to hyperfractionation, there are reference studies, such as the RTOG 8311, which showed that the dose of 69.4 Gy was more effective than lower doses, and is not demonstrated benefit in higher doses.

The RTOG 8808 study showed the superiority of a regime of hyperfractionation with chemotherapy. Jeremic in another randomized study confirmed that adding chemotherapy to hyperfractionation improved clinical outcomes.

Finally, the RTOG 9410 study reaffirms the superiority of hyperfractionation treatments with chemotherapy added to standard treatment.

Hyperfractionated accelerated RT

In the case of accelerated hyperfractionation, evidence suggests that in lung cancer the overall treatment time is as important as the escalation of doses, in order to control the impact of the rapid repopulation of this type of tumor.

A classic study, the CHART (dose of 1.5 Gy, three times a day, for twelve consecutive days) showed improvement in overall survival in comparison with conventional radiotherapy.

However, randomized studies after the CHART has failed to demonstrate a significant improvement in the treatment with accelerated and hyperfractionated radiotherapy.

There are still outstanding for both the parameters of this type of radiation therapy, as well as its possible association with systemic treatment with chemotherapy.

Hypofractionation

There are few randomized studies on hyipofractionation in lung cancer. One of them used weekly doses of 5 Gy, noting promising results in terms of control of the disease and survival, without increase in toxicity.

Daily doses above 2 Gy (2.24, 2.36) were used in other studies noting some improvement in disease-free interval. There are however define even the most effective schemes in this form of hypofractionated in lung cancer.

Conclusion

New technical advances in radiotherapy enhanced the possibility of targeted treatment and sparing of normal tissues, making high BED studies possible.

The interest in altered fractionation schedules in the treatment of lung cancer is increasing, especially on hyperfractionated and accelerated schedules.

In the case of hypofractionated treatments there are still doubts about the usefulness of them, since published studies are very heterogeneous, being necessary to further investigate the possibilities of this therapeutic, very useful option in the case of other tumors.

CONTROVERSIES IN THE TREATMENT OF SMALL CELL LUNG CANCER (SCLC): WHEN DOING CHEST CONSOLIDATION; PCI ROLEIN EXTENSIVE DISEASE

JEREMIC, B.

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BioIRC Centre for Biomedical Research. Hragujevas, Serbia

Educational purpose of this talk is to provide both historical and current aspects of the place and the role of thoracic radiation therapy and prophylactic cranial irradiation in patients with extensive disease small cell lung cancer. It will also provide comparisons between studies published so far and offer insight into potential questions for future clinical trials in this disease.

RADIOTHERAPY AND NEW TREATMENT AGENTS IN LUNG CANCER: ¿HOW TO COMBINE THEM?

COUÑAGO LORENZO, F.

University Hospital Quiron. Madrid

Introduction

Targeted therapy is a tumor cell growth blocking agent that interferes with specific molecules necessary to the carcinogenic process. During this talk, we will examine the part that targeted agents play in non-small-cell lung cancer (NSCLC), combined with thoracic radiotherapy (RT) in stage III and with stereotactic body radiation therapy (SBRT) in stage I-II and oligometastatic patients.

Targeted therapies and thoracic radiotherapy

Radiation activates epidermal growth factor receptor (EGFR) pathways, inducing resistance to radiotherapy, cell proliferation and DNA repairing. In preclinical models, cells with EGFR mutations have increased radiation-induced apoptosis. After promising data in preclinical models and in initial clinical trials, cetuximab, an epidermal growth factor receptor (EGFR) monoclonal antibody, did not show increased outcomes in a recent phase III randomized clinical trial (RTOG 0617). In addition, panitumumab and nimotuzumab are still under clinical evaluation. The tyrosine kinase inhibitors (TKIs) group includes mainly gefitinib and erlotinib. Results in phase I and phase II trials assessing combinations of these treatments compared to RT have had very dissimilar results. Combining gefitinib with thoracic RT or thoracic radio-chemotherapy has not shown an increase in survival, with the possible exception of Asian population, in which Ohe et al. proved a heartening median survival of 28 months. In any case, only 61% of these patients completed treatment, while the

remaining halted treatment due to stage ≥2 radiation-induced pneumonitis. Trials ith erlotinib in association with thoracic RT have obtained relatively positive results: two studies have shown progression-free survival of 7.5-13.6 months and global survival of 14.4-25.8 months. There are, however, high percentages of severe radiation-induced pneumonitis, as with gefitinib. Several clinical trials combining TKI with radiotherapy or thoracic radiochemotherapy are currently underway. There are still very few data on the combined use of RT and afatinib, a new TKI that has proven beneficial in disseminated NSCLC.

Antiangiogenic medication increases tumor oxygenation, improving therapeutic efficacy of RT in lab models. Bevacizumab, thalidomide and endostatin, however, have shown high levels of toxicity (esophagitis, trachea-oesophageal fistula) and low efficacy in combination with RT. Other antiangiogenics are more promising (vandetanib).

The combination of RT and targeted therapy is very promising and has the potential to improve clinical results in NSCLC patients. Still, more studies are needed to answer questions as to which medication to choose, which patients will potentially benefit the most from these treatments, when to administer treatment, and lastly, what side effects are to be expected. New pathways and agents are being studied in combination with RT, examples being m-TOR pathway, bortezomib, heat shock protein 90 (Hsp90) inhibition, histone deacetylase (HDACS) inhibitors, aurora kinases, mitogen activated protein kinases (MARK), PARP inhibitors, and immunotherapy as well as genomic signatures to predict patient response to RT.

Targeted therapies and SBRT

The identification of driver mutations in patients with oligometastatic NSCLC allows targeted therapies to achieve higher survival rates and low toxicity when compared to chemotherapy. In most studies, patients are considered oligometastatic up to 3-5 metastases. In this specific group of patients, local metastatic control is of great importance because of its potential to increase survival, as it was recently concluded at the consensus meeting of European Society for Medical Oncology (ESMO). The optimal moment for treatment with RT in oligometastatic patients, mainly SBRT, is as of yet unknown. In this aspect, retrospective studies of the University of Colorado have shown that in patients with low progression during treatment with molecularly targeted therapy (erlotinib, crizotinib), local treatment with SBRT of metastases that do progress, increases the duration of efficacy of target therapy, a delay in the use of chemotherapy, and an increase of both disease-free survival and global survival. The combination of SBRT with antiangiogenic medication (bevacizumab…) is being investigated and must be done with caution in order to avoid severe toxicity (surgical wound complications, trachea-oesophageal fistula, radiation recall pneumonitis, intestinal ischemia…).

Until more robust data become available, the combination of targeted therapies with SBRT should be done with caution, as some cases of fatal toxicity have been reported. There are prospective studies underway (NCT01730937…) assessing the efficacy and toxicity of SBRT with biologically targeted therapies.

RE-IRRADIATION WITH RADICAL INTENT IN LUNG CANCER: RESULTS OF CONVENTIONAL AND ACCELERATED FRACTIONATION

SENAN, S.

VU University Medical Center. Amsterdam, Holanda

Experience with conventionally fractionated high-dose thoracic reirradiation is relatively limited. A literature review in 2011 suggested that "For selected patients, chest reirradiation appears to be feasible, safe, and effective at relieving symptoms associated with recurrence. Depending on patient and disease presentation at relapse, long-term control also may be possible by increasing RT dose (Jeremic B, IJROBP 2011)". We have performed this procedure in selected patients in the past decade using 4D CT scans, PET-CT scans, and IMRT delivery (Griffioen G, Lung Cancer 2014), and have updated our results recently (Tetar S, Lung Cancer 2015). On the basis of our published selection criteria, we continue to offer high-dose thoracic re-irradiation to selected and appropriately counseled patients, despite the increase in treatment-related local toxicity. More work is needed to optimize re-irradiation techniques and schedules, and improve response evaluation in the re-irradiated region for these patients.

With the growing availability of stereotactic ablative radiotherapy (SABR), results using this modality for mainly small-volume lung parenchymal disease has been reported by a number of centers (e.g. Peulen H, Radioth Oncol 2011; Trakul N, JTO 2012; Reyngold N, Rad Onc 2013; Kilburn JM, Radioth Oncol 2014). While the reported follow-up is relatively short, subacute and late toxicity is increased after SABR, with a suggestion that long-term survivors appear to derive benefit. It is clear that all patients who are candidates for SABR for small-volume disease should be discussed in a multidisciplinary team, where the possibility of surgery should also be considered.

12:15-14:15
COMBINED TREATMENT IN THE RADIATION ONCOLOGY

CONCURRENT RADIOCHEMOTHERAPY IN THE TREATMENT OF CANCER: CURRENT STATUS

HERVÁS MORÓN, A.

University Hospital Ramón y Cajal. Madrid

Nowadays a large proportion of oncology patients seen worldwide have locally advanced or metastatic cancer. For such patients, radiation therapy (RT) and/or chemotherapy (CHT) are frequently used, either alone or, with increasing frequency in recents decades, as a combined treatment modality with curative intent.

There now several decades of experience with combined treatment (RT and CHT). Many tumour sites, histologies and stages of disease have been the subject of intensive preclinical and clinical investigations. We have also witnessed tremendous change in technological aspects (of RT), with the passage from 2D to 3D RT to 4D to IMRT and IGRT and further to stereotactic RT, protons and carbon ions, all leading to more precision in treatment delivery. We have gathered enormous experience with new drugs, from second generation (e.g., cisplatin, etoposide) to third generation (e.g., paclitaxel, vinorelbine) to targeted agents (e.g., cetuximab). WEehave also not only investigated efficacy of various RT/drugs combinations, but also gathered precious information about the side effects of such, usually intensified treatments.

Well, then, what we have learned, so far, and what is the current status of combined RT and CHT? In the oral presentation we analized particularaties of combined RT and CHT in various tumor types. Due to the limited space envisaged for this summary only some of the major findings will be summarized and some specific and very important aspects highlighted.

Data from multiple prospective randomized trials and meta-analyses clearly identify concurrent RT-CHT as the standard treatment option in many tumour types and sites such as head and neck, lung or cervix, given either as exclusive or in postoperative setting (e.g., head and neck cancer). Similarly to these, the majority of gastrointestinal cancers, some genitourinary cancers as well as some brain tumours are also treated this way. Exceptions exist, most notably breast cancer, prostate (though with hormones) and some bone and soft tissue sarcomas, where concurrent RT/CHT studies are lacking but some are already underway.

Superiority of concurrent RT/CHT over RT alone was achieved due to improved loco-regional tumour control, wich is in sharp contrast to induction CHT studies, wich always improved overall survival (over RT given alone) due to improved distant metastasis control. Excellent examples for the two observations are head and neck cancer, lung cancer and cervix cancer.

When considered from the standpoint of exploitable mechanisms, concurrent RT/CHT offered improvement due to CHT-induced enhacement of RT effets, showing that there is an interaction between the two treatments modalities due to concurrent administration. We target loco-regional disease, not the distant one (or microscopic one *per se*).

We have to generate interest amomg young people-given that they are the future- in the speciality regarding one of its most important medical aspects at a time when there is a very strong focus on a particularly brilliant new technology that requires effort, study and attention in order to know, master and apply it.

In this presentation we will provide an up to-date overview of the possibilities and status of radiochemotherapy in the context of cancer treatment standards through the most complete knowledge of evidence-based medicine for each oncological pathology.

COMBINED SYSTEMIC TREATMENT WITH SBRT

RODRIGUEZ CORDON, M.

Provincial Hospital. Castellón

Targeted therapy (TT), such as monoclonal antibodies and tyrosine-kinase inhibitors (TKI), represents an important progress in medical oncology. Stereotactic body radiotherapy (SBRT) allows high accurate dose that may be more radiobiologically effective and more convenient for patients.

Trials combining SBRT with TT or/and chemotherapy treatments are summarised below.

Pancreas

Standard treatment for pancreatic cancer (PCA) remains with poor outcomes. Single-fraction SBRT has demonstrated excellent tumor control but high toxicity. Multiple-fraction SBRT appears to enhance tolerance treatment.

Unresectable. Few reports evaluated SBRT not-single fraction + gemcitabine-based chemotherapy (GBC), no one concurrent. A significant pain-control improvement was observed. Following these studies, use of pancreatic fiducial markers and of movement management techniques became essential.

Borderline resectable (BRCP). Surgical resection with negative margins (R0) is the only potentially curative option. Chuong reported a retrospective review including 57 BRCP treated with GBC followed by SBRT using a dose painting technique. Resection was carried out when possible. 56.1% underwent surgery, 96.9% get R0. Patients R0 had improved overall survival (OS) and 1-year survival progression-free. Toxicity was acceptable. Rajagolapan reported a similar group and their results were consistent with those obtained by Chuong. SBRT seems useful in converting BRCP to resectable patients albeit technical considerations should be defined.

Future studies should be performed to determine organ tolerance, optimal systemic therapy and patient selection based on molecular profiling; patients with intact DPC4 suppressor gen have a higher probability of exclusive locally disease.

Liver

Local therapy for hepatocellular carcinoma (HCC) may be curative but comorbidity and late diagnosis challenge treatment administration. Sorafenib, oral TKI, improve survival in advanced HCC. SBRT, delivery in ≤10 fractions, has shown ameliorated OS and local control (LC) in locally advanced HCC despite the increased risk of toxicity. A phase I trial evaluated concurrent sorafenib/SBRT (6 fractions in 2 weeks). 16 patients started therapy but 3 completed as planned. Three severe acute toxicity (AT) forced to de-escalation sorafenib. Although toxicity, local response was impressive (40%). Currently, RTOG addresses a phase III trial randomized with sorafenib ± SBRT.

Lung

Lung cancer remains an important cause of cancer-death. Treatment approach to non-small cell (NSCLC) has changed for TT. SBRT alone has demonstrated its safety in several published reports. However, we should be cautious because some studies showing an increased pulmonary toxicity with combined therapy.

A Chinese prospective non-randomized study included 26 stage III/IV NSCLC treated with gefitinib or erlotinib concurrent with RT-thoracic. TKI maintenance therapy was administered until tumor progression, intolerable toxicity or death. 14 patients were treated with SBRT exclusive or ± IMRT/CRT. Not grade IV AT occurred. Asymptomatic/symptomatic pulmonary fibrosis ≤2 was the more frequent late toxicity (LT). There were no statistically significant differences between gefitinib/erlotinib in terms of pulmonary toxicity. This report is the first demonstrating safety of TKI+radiotherapy.

Patients with stage IV NSCLC fail most commonly in original sites of gross disease. A single-arm phase II included 24 recurrent stages IV NSCLC with less than six sites extracranial disease. Patients received erlotinib concurrent with SBRT (1-5 fractions; cumulative dose 19-40 Gy). Researchers observed an association between SBRT-treated sites number and higher mortality. There were only three local SBRT failures out of 47 lesions evaluable. Results are promising but they should be reproduced in a randomized trial.

Head and neck (HN)

Therapy options for loco-regional recurrences or second tumor (LRR/ST) in previously irradiated HN patients are limited. Salvage surgery is the standard but not sufficient in locally advanced disease. Full-dose re-irradiation with conventional RT provides high toxicity. A phase I dose-escalation trial of SBRT re-irradiation showed a small number of adverse events.

Unger reported 33 LRR/ST patients treated with chemotherapy + SBRT. Most patients received 5×6 Gy but SBRT plan was individualized. Higher total dose was significantly correlated with improved loco-regional control. Grade IV LT was observed in 9%.

Two authors investigated SBRT + cetuximab, comparing SBRT alone versus concurrent cetuximab. Toxicities were comparable in both groups and an OS benefit was seen for the cetuximab arm.

SBRT is a promising salvage therapy with encouraging LC rates and justifiable toxicities. Severe LT has been reported but it is less frequent than in patients with conventional techniques. Very high single-fraction doses should be avoided.

Melanoma

Currently, three studies are in recruitment to evaluate ipilimumab + SBRT.

NEW DEVELOPMENTS AND FUTURE RADIOSENSITIZATION

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Educational purpose of this talk is to briefly provide historical background for radiosensitization and focus on interaction of novel radiation therapy technologies (e.g. stereotactic radiotherapy) and new drugs and technologies (e.g. nanotechnology) in the research and clinical aspects of cancer nowadays. It will also indicate opportunities that lay ahead, including those that are stil lunder theoretical considerations.

12:15-14:15
SBRT

CLINICAL EVIDENCE AND ADVANCES IN SABR IN EARLY-STAGE LUNG CANCER

SENAN, S.

VU University Medical Center. Amsterdam, Holanda

In current European and North American guidelines, stereotactic ablative radiotherapy (SABR) is now the recommended therapy for unfit patients with a peripheral early-stage non-small cell lung cancer, and also for those who refuse surgery (Louie AV, Radiotherapy Oncol 2015). Much supporting evidence for use of SABR has come from population studies, where an increase in overall survival was observed compared to no treatment or treatment by means of conventional radiotherapy. Current SABR practice is guided by recommendations from scientific societies, that address patient selection, treatment planning, SABR delivery, and follow-up schedules (IASLC Multidisciplinary Approach to Thoracic Oncology 2014; ESMO guidelines, Vansteenkiste J, Ann Oncol 2014).

Use of SABR for patients who are fit to undergo surgery is the topic of active research. In the absence of completed phase III trials, comparative effectivess research (CER) has been performed using techniques like propensity-score matching, match-pair analysis, Markov modeling, cost-effectiveness and meta-analytic methodologies (Louie AV, Radiotherapy Oncol 2015). The main conclusion from the CER studies is that local control rates are comparable, indicating clinical equipoise when comparing SABR and surgery, especially in the face of competing risks of death associated with advanced age and increased co-morbidities. Recently, a pooled analysis of two randomized controlled trials comparing surgery with SABR, both of which failed to accrue sufficient numbers of patients, was reported showing a higher overall survival following SABR as compared to surgery (Lancet Oncology, in press). A new generation of randomized trials of SABR versus surgery in operable patients is now in preparation in the United Kingdom (SABRtooth) and the United States (VALOR). Both the new studies involve an initial approach to patients by a neutral party consisting of a pulmonologist and research nurse, thereby reducing bias that may be introduced if the patient is initially seen by either a surgeon or radiation-oncologist.

STEREOTACTIC BODY RADIOTHERAPY IN HEPATOCELLULAR CARCINOMA

CARDENES, H.

Indiana University School of Medicine. EE.UU.

Hepatocellular carcinoma is the most frequently occurring primary tumor of the liver in adults and the fourth most common cause of cancer-related deaths in the world. Its rising incidence in the United States and Europe is attributed to the increased incidence of hepatitis C infections. Currently, the optimal treatment for hepatocellular carcinoma is orthotopic liver transplant or surgical resection for selected patients. However many patients are not able to undergo these radical interventions. Historically, radiotherapy for hepatocellular carcinoma has been shown to be poorly tolerated in the cirrhotic liver and has had suboptimal results with standard fractionation. With the introduction of stereotactic body radiotherapy (SBRT) techniques, there are emerging data indicating that the use of targeted, highly conformal, hypofractionated ablative radiotherapy can provide results that compare favorably with other ablative procedures for hepatocellular carcinoma in terms of local control, safety and survival. Therefore, SBRT is gaining interest as an alternative, safe, non-invasive and effective technique for the treatment of appropriately selected patients who are not able to undergo orthotopic liver transplantation, and as such warrants greater recognition as a viable option in the management of this malignancy. In addition, SBRT is now considered to be the primary option for bridging to transplant in high-volume institutions, provided the patient meets eligibility criteria.

In addition to ensuring local control, toxicity avoidance should be a priority in setting up patients with hepatocellular carcinoma for SBRT. Relatively few trials have correlated toxicity to dosimetric parameters, especially in the setting of CPC-B patients. Further analysis is needed to determine more specific dose-volume constraints for liver SBRT in both CPC-A and CPC-B patients. Adequate patients' selection, treatment planning, and strong quality control program are imperative when using SBRT for the management of liver malignancies.

The impact on overall survival of liver SBRT relative to other liver directed therapies remains to be determined. The heterogeneity of the population, especially with regard to the severity of liver cirrhosis and the presence or absence of extensive comorbidities, precludes an accurate comparison of overall survival, and formal phase II/III investigations are required before comparisons can be made.

During this presentation will review the current status of SBRT in the management of hepatocellular carcinoma.

INTRODUCTION - SBRT IN LYMPH NODE OLIGOMETASTASES

CONDE MORENO, A.

Provincial Hospital. Castellón

To date, there was no consensus on the use of SBRT in oligometastatic patients, the optimal dosage, number of fractions, prescription dose or dose limits for critical organs, although it is a technique that is in a period of expansion since the increasing number of indications presented. Therefore from the Spanish Society for Radiation Oncology (SEOR) promoted to make a consensus on the use of this technique in different locations: lung, liver, spine and lymph node metastases. This consensus has developed in a series of phases. In the first, we perform a literature selection of the best publications on SBRT in each pathology and

select a 8-9 national radiation oncologist with high experience in SBRT for each of the topics, for a discussion of the major controversies. The findings in each group were presented at a session in which 35 specialists expressed through a vote, their agreement or disagreement with each of the conclusions reached. Finally, according to the design Consensus SEOR on the role of SBRT in oligometastatic patients, the conclusions whose degree of agreement was endorsed by 70% of specialists have established themselves as SEOR RECOMMENDATIONS OF CONSENSUS with respect the question at issue. The second phase is the publication of this consensus and third is the continuous updating and sharing with SBRT recomendations who will perform the Spanish society of medical physics.

The lymph node metastases are one of the main routes of tumor spread. Its incidence after curative treatments varies widely, from 7% in prostate tumors up to 15-20% in colorectal and gynecological tumors.

Although there is less experience in SBRT for lymph node oligometastases, recently have been published several series in which rates higher local control and minimal toxicity. In the text of SEOR consensus on SBRT for lymph node oligometastases, the answer to the following questions are discussed:

Definition and indication of SBRT

SBRT is an ablative radiotherapy administered in a number of fractions between 1 and 8 at doses greater than or equal to 8 Gy fraction (or equivalent BED10Gy ≥100) in conditions of high conformation, high doses and high gradient. Our dosimetry recommendations include the prescription to PTV, and should cover at least 95% of the volume of the PTV, the maximum dose in the PTV ≤125%, 99% of the PTV receive at least 90% of the prescribed dose and the conformity index ≤1.5.

Should we establish minimum technical requirements for SBRT?

Yes, and should include: a IGRT verification system: On-line daily, recommending Cone-Beam for proper localization of GTV and the organs at risk (small bowel) and adequate immobilization using a custom dedicated system that ensures intrafraction stability. Appropriate bowel preparation considering the variation of its is recommended. For the simulation CT, should be done fasting ≥6 h, like treatment, keeping empty the rectum and bladder in pelvic treatments. 4D-CT simulation is recommend.

Should we recommend a specific dose or fractionation based on histology?

To date there is insufficient scientific evidence to recommend a different dose per fraction as a function of various histologies, although colorectal and gastric origin seem to require higher doses per fraction.

When performing imaging in monitoring?

It is recommended that imaging techniques that were used in the diagnosis, the first 3 months and continue every 3-6 months depending on the evolution and in default to follow the WHO/PERCIST/RECIST criteria by CT/MRI/PET.

What are the scenarios for an exclusive SBRT or boost?

In situations of oligo-recurrence would be indicated exclusive SBRT, while in situations synchronous oligometastases we do not have enough evidence to recommend against its use as a boost with external radiotherapy.

Is there a recommended sequence for chemotherapy and SBRT?

There is no clear recommendation, although patients with indiced metastases or oligoprogressive disease (post-chemotherapy) have a worse outcome than the patients who present *"de novo"* metastases. We will have to try to keep logistical criteria for instituting both treatments.

CONSENSUS OF THE SEOR-SBRT-SG ON SBRT IN LUNG METASTASIS

MORERA, R. (General University Hospital. Ciudad Real); VALLEJO, C. (Univesity Hospital Ramón y Cajal. Madrid); PALACIOS, A. (University Hospital Reina Sofia. Córdoba); GOMEZ CAAMAÑO, A. (University Hospital Clinic. Santiago de Compostela); HERNANDO, O. (University Hospital HM Sanchinarro. Madrid); NAVARRO, A. (Catalan Institute of Oncology. ICO. Barcelona); LARREA, L. (Hospital Nisa Virgen del Consuelo. Valencia); RICO, M. (Hospital complex. Navarra); CELADA, F. (University and polytechnic Hospital La Fe. Valencia)

Is there sufficient scientific evidence to try, safe and effective way, with SBRT, pulmonary metastases in oligometastasica situation?

After reviewing the published literature on the treatment of lung oligometastasis, most of the articles are retrospective series, highlighting the existence of a systematic review, published in the Journal of Thoracic Oncology, collecting a total of 19 studies in 2010, of which six are phase I studies and one phase II. Until now no study there is no phase III. In relation to the surgical treatment in pulmonary metastases, notably that all the posted experience is retrospective. The reported two-year survival rate is 70%, but it should be noted that these figures are difficult to compare with SBRT series, already that patients undergoing surgery, by the fact of being operable, overall and less co-morbidity have better.

The results reported with SBRT, can be summarized in: rate of local control to two years of 78%, overall survival two years 54%, and rate of ≥ toxicity grade 3 around 2, 6-5%. With the above data, it can be said that it is a safe and effective technique.

What are the eligibility criteria for patients with pulmonary metastases, treatment with SBRT?

— Do not age limit to receive such treatment.
— ECOG 0-2.
— The inoperable by medical comorbidity or who refuse surgery. There is no limitation on how pulmonary functional status, provided that the patient can collaborate in the realization of the technique.
— It will pose SBRT both in case of metachronous metastases synchronous metastases with the diagnosis of the primary tumor, always and when we are in situation of primary tumor controlable.

There is limit on the number and size of lesions to be treated with SBRT?

According to the definition of Hellman we talked about oligometastasica disease, when the total number of metastases is <5. In the International Register of Pulmonary Metastases, surgical retrospective that included more than 5000 patients, series collecting the experience of 18 departments of thoracic surgery from Europe, USA and Canada, it was concluded that the number of metastasis is one of the most important prognostic factors. In the review of the literature, there are several series that establish best results when the number of metastases treated, is limited by what consensus suggest to treat a number of metastases ≤ 3. In relation to tumor size, in published articles, there is variety in the size of the treated lesions, ranging between a few millimetres and up to 7 cm, although most of the authors put the limit in

one larger lesion ≤5 cm diameter. This size would also coincide with the definition of Hellman's disease oligometastasica.

The council is treating lesions ≤5 cm, but is could value to treat lesions of larger size, if the dose received by the organ at risk does not exceed the tolerance dose marked by RTOG.

Is there indication to treat with SBRT with non-controlled primary tumour and/or presence of extrathoracic metastatic disease?

A large number of published studies, the eligibility criteria require that the primary tumor is controlled and absence of extrapulmonary metastatic disease. The International Registry of Pulmonary Metastases, already referred to above, concludes that one of the factors most relevant odds for survival is the disease-free interval, so that a disease-free interval >36 months entails a significantly better survival, further testing that this difference was maintained for different histologys of primary tumors. The conclusion that can be obtained from the published studies, is that, in the presence of disease extrapulmonary metastatic not modify pulmonary metastases treated with SBRT, local control rates but if worse overall survival rate to 2 years: 80% in absence of metastases extrapulmonary happens to figures of 30-40% with the presence of the disease.

The council is to deal with primary tumor controlled or potentially controllable and absence of extrathoracic metastatic disease or is potentially controlable.

Is it necessary to make PET-CT before SBRT and have histological confirmation of pulmonary metastases?

The majority of studies do not make explicit reference to these demands. We consider advisable to the realization of PET-CT as proof for staging disease, especially to evaluate the existence or no metastatic disease extrathoracic, given the prognostic importance that may have. We consider advisable wherever possible histological confirmation of pulmonary metastatic lesions, but would be enough to consider treatment with SBRT radiological criteria of the same, as according to some authors, would be defined as: existence of pulmonary nodules of emerging especially if they have size >8 mm, and this would be reinforced with metabolic activity in the PET-CT with maximum SUV >4.5.

What dose and fractionation scheme be more appropriate?

Despite being mostly retrospective studies, there is a clear dose-response relationship, both primary lung tumors and metastasis. There are many studies that establish the need to manage BED >100 Gy (alpha/beta tumor 10 Gy) about the tumor, since there are significant differences in the results obtained, depending on dose above or below. These significant differences occur in terms of local control and survival in case is SBRT treatments in early primary tumors from lung, however in the case of pulmonary metastases SBRT only there are significant differences in terms of local control. Also we have seen that equality of BED, local control rates are higher in primary tumor in lung metastasis. With respect to the fractionation schemes cannot be concluded that one is superior to another in terms of better clinical results. There are several groups who use the fractionation scheme adapted risk of the Dutch group of Senan (3×20 Gy in small tumors not next to wall costal and central location, 5×12 Gy in tumors of greater size or close to wall costal to reduce the risk of fracture rib or wall rib pain, and 8×7.5 Gy in tumors of central location), presenting good rates of local control and survival, with low toxicity.

With respect to the time of separation between fractions, some authors aim to leave a minimum of 36 h between fractions to take advantage of the effect of reoxygenation and a maximum of 72 h to avoid restocking.

The final recommendation is to manage BED >100 Gy with alpha/beta tumor 10 Gy, with dose fraction ≥7.5 Gy, and a total time of treatment not exceeding the 15 days.

Where should I get the dose prescribed?

Little uniformity on where dose prescription should be, and even, occasionally, not makes no reference to this information is observed in the studies reviewed. Thus we find authors who prescribe to a point (isocenter), others prescribe to a volume (GTV, PTV), and other prescribed an isodose.

Our recommendation is to make prescription dose to the PTV, we propose to adjust to the RTOG dosimetric parameters: 99% of the PTV shall receive at least 90% of the prescribed dose, and doses equal to or greater than 105% of the dose prescribed outside the contours of the PTV is not recommended (maximum 105% volume 15% of the volume of PTV).

SPINAL OLIGOMETASTASES

LOPEZ RAMIREZ, E.

ONCOSUR. Granada

The 5-10% of cancer patients will develop spine metastases. With the improvements in systemic therapies, the incidence will be greater as patients live longer. Spine metastases are responsible for the deterioration of the patients' quality of life.

Spine metastases treatment is multidisciplinary. Radiation therapy (RT) is essential for pain control in 50-80% of patients.

Surgery is important in the therapeutic strategy. Vertebroplasty and kyphoplasty are other effective treatments.

The new technique Stereotactic Body Radiotherapy (SBRT) for spine metastases is a logical extension of the current state of the art of RT in appropriately selected patients.

SBRT allows irradiation of a small target volume to a high dose of radiation (fractions 1 to 5) and thus a high biological equivalent dose (BED) is administered, while protecting the organs at risk (bone marrow and other paraspinal organs dose-sensitive). This allows overcoming the intrinsic tumour resistance to ionizing radiation.

SBRT objectives are to improve clinical response rates (approximately 90% pain and neurological control) and control tumour (about 80% or more), to reduce the repetition rate of treatment and are effective in treating previously irradiated areas with an acceptable safety profile.

However, evidence from the literature on spinal SBRT is poor and, nowadays, is more expensive than conventional RT.

STEREOTACTIC BODY RADIOTHERAPY FOR OLIGOMETASTATIC LIVER LESIONS

GARCIA GARCIA, R.

Madrid Institute of Oncology. IMO. Madrid

Nowadays and thanks to the technological developments in Radiotherapy it is possible to deliver a very high radiation dose, in a highly precise way, to liver metastases, with Stereotactic Body Radiotherapy techniques. As the liver obeys to the radiobiological model with parallel functional sub-units, it is possible to deliver such a high dose in very few fractions without the risk of generating hepatic radio-induced disease as far as 700 cc of healthy liver received less than 15 Gy.

Even though there are no prospective randomized clinical trials with level 1 of evidence that compared liver SBRT results with other techniques results such as surgery or radiofrequency, the results of several retrospective studies and at least eight phase I and II trials, show a local control around 70-90% in 2

years, with very low severe toxicities (below 5% in almost all the studies).

Following those results we consider that SBRT treatments are already an alternative that can be taken into account in the case of oligometastatic patients unsuitable for surgery.

Inclusive criteria for hepatic metastases SBRT are good general condition (ECOG 0-1) and adequate test results: hemogram (neutrophils >1800/mm^3; platelets >100.000/mm^3; Hb >10 g/dl); hepatic function (BT <2 mg/dl; albumin >2.5 g/dl; normal coagulation; transaminases <5 times nominal value).

It is allowed potentially treatable extra-hepatic disease and although most hepatic SBRT studies concur that there are factors related with a better prognosis, such as patients with 1-3 lesions, small size lesions (<3-5 cm or GTV <100 cc), total doses BED 100 Gy; metachronous metastases, non colo-rectal metastases and non previous chemotherapy treatments, the fact is that the total number of metastases that can be treated, the maximum volume of the lesion, the suitability of re-irradiation, the possibility of subsequent SBRT treatment or the possibility of concomitant systemic treatments are not well established yet and prospective studies are indeed needed.

Most of phase I-II studies describe a 3 fractions scheme (range, 1-5 fractions) and recommend total doses between 45-60 Gy (BED 100 Gy) as 2 year local control of more than 90% can be achieved when nominal doses >60 Gy. Nevertheless the most suitable dose regarding the lesion size, time between fractions or doses regarding the lesion etiology are not established yet.

Follow up protocol is not well defined either but same image studies as used for diagnose are recommended. The first follow up study should be acquired 3 months after treatment and subsequently every 3-6 months.

Treatment response should be evaluated following well established criteria (OMS, RECIST 1.1, EORTC-PET, PERCIST 1.0 or Choi).

FUTURE STRATEGIES IN SBRT

YAMADA, Y.

Memorial Sloan Cancer Center. New York, EE.UU.

Stereotactic Body Radiosurgery has a number of distinct advantages over conventional fractionated therapy in the management of focal oncologic problems. Because of the high precision of image guided technologies, SBRT makes treatment with minimal margins feasible, and radiation dose can be delivered exactly as intended in just about any part of the body. This technology, coupled with high efficiency intensity modulation, allows for highly conformal radiation treatment that delivers ablative doses of radiation to tumor targets while minimizing the amount of radiation given to surrounding normal tissues. Advances in modern cancer imaging have also allowed for the precise localization of tumor. Hence, the 21 century oncologist can treat specific lesions with a high degree of confidence with the expectation of minimal toxicity and a high probability of durable tumor control, in a minimally invasive manner with little risk of negative impact upon quality of life.

The mechanisms of response to ultra high dose radiation, which SBRT is particularly well suited to deliver, are biologically very different from conventional radiation. These involve engaging the stromal compartment of tumors, such as the endothelial cell membrane and possibly immune responses. These unique mechanisms of response are opportunities for manipulation to further enchance the therapeutic ration in favor of patients. It is becoming increasingly clear that SBRT can be truly ablative therapies.

There is no question that survival in stage IV cancer is dramatically improving with more rational systemic therapy. It is becoming increasingly clear that a significant minority of patients are oligometastatic, and do not have virulent metastatic disease. With more effective systemic agents, there may also be a state of acquired oligometastases, in which patients are rendered oligometastatic. In either case, SBRT likely has an important role to play in the management of these patients, and in the case of immunologic responses, synergies may exist which favor SBRT over metastatectomy.

With prolonged survival, an increasing proportion of patients will be experiencing local failure of initial radiotherapy. Hence salvage radiation/reirradiation is also becoming an increasingly frequent indication for SBRT. A growing body of literature suggests that salvage therapy is equally effective and that serious complications are rare even in the setting of reirradiation when SBRT is utilized.

The pattern of late toxicity may also prove to be different that what would be expected with conventional radiation. For example, serious late toxicity is infrequent after spine radiosurgery in long term survivors, and doesn't appear to increase with extended follow up, suggesting that perhaps irradiated volume may be more important than dose for long term complications. Hence minimal margin radiation may be able well tolerated, even in patients who survive beyond 5 years.

In addition, it is also likely that SBRT may be a more efficient use of limited resources such as linear accelerator time. Patients undergoing SBRT will be able to complete a course of treatment within 1-5 fractions without sacrificing tumor control or the probability of being free of toxicity. Thus future studies regarding cost effectiveness will be an important contribution to the acceptance of SBRT.

SBRT is the future of radiotherapy. Strategies to improve treatment delivery, identify targets, reduce dose to normal tissues and enhance biologic effects will be important future enhancements to the basic SBRT paradigm and help establish SBRT as the preferred modality for treatment in many clinical scenarios.

16:00-18:00
BRACHYTHERAPY

FOCAL IRRADIATION WITH MONOTHERAPY FOR PROSTATE CANCER

HOSKIN, P.

Mount Vernon Hospital. iddlesex. United Kingdom

Conventionally when treating prostate cancer the entire gland is considered to be at risk and forms the Clinical Target Volume. However this is not always so and it is now clear that even in multifocal disease many small foci of low risk prostate cancer may never become significant in terms of metastatic potential and impact on survival. It is therefore possible to consider that significant prostate cancer is in many cases limited to only one part of the gland and radical ablative treatment restricted to that part of the gland can be considered. This approach depends upon reliable evaluation of the cancer and confidence that significant disease is identified. Multimodality imaging including multiparametric MR (T1,T2, DCE and DWI) and choline PET enables non-invasive mapping of tumour distribution but confirmation of the limited extent and histological grade from template mapping biopsies is also important.

While there are a number of non-radiation modalities which are under evaluation, when considering radiotherapy, brachytherapy provides the most focal approach enabling high concentrated dose to the CTV whilst limiting dose to the organs at risk. Monotherapy, delivering the radiation within a single procedure is the optimal application of brachytherapy. Low dose rate (LDR) seed brachytherapy may be used and high dose rate (HDR) can now be given as a single dose of 18-20 Gy for ablative treatment.

Currently clinical data on monotherapy as a focal approach to prostate cancer is sparse and ongoing studies are needed to evaluate this approach within rigorous prospective protocols.

NEW APPROACHES FOR NON-MELANOMA SKIN CANCER: HIGH DOSE RATE BRACHYTHERAPY

CELADA ALVAREZ, F.

University and Polytechnic Hospital La Fe. Valencia

Basal cell carcinoma (BCC) is the most common skin cancer, accounting for approximately 75% of all skin cancers.Although non-melanoma skin cancer (NMSC) is usually not a life threatening condition, it is a growing public health concern because of the significant impact on quality of life.

Surgery is the most frequent treatment, with excellent control rates, for both excision and Mohs surgery. Cryotherapy, topical chemotherapy, photodynamic therapy and radiotherapy (RT) are other treatments options. Very few randomized studies have been undertaken comparing treatment modalities. In a meta-analysis of the Cochrane Library, published in 2007, a total of 27 studies were collected and the authors concluded that surgery and RT are the treatments with lower rates of recurrence.

RT is usually indicated for elderly patients, patients who do not want surgery, patients with multiple cancerous lesions, patients with contraindications for surgery or patients where surgery would result in a more disfiguring outcome, besides as adjuvant therapy in high-risk NMSC.

Superficial X-rays, electron beam, megavoltage photons, low or high-dose- rate (HDR) brachytherapy (BT) and new emerging techniques such as electronic brachytherapy (EBT) are different radiotherapic options. In case of deeper lesions (>5 mm) EBRT or interstitial BT it is indicated, but for smaller than 5 mm depth lesions standardized applicators as well as flaps and moulds are available. Regardless of the used technique, HDR-BT approaches have reached a paramount relevance, achieving excellent cures rates and cosmetic results. In case of small tumors, BT with standardized applicators is an efficient solution, providing a higher shielding to the surrounding healthy tissues when compared to moulds and flaps.

Three topics are critical when treatment with surface BT: dose & fractionation, clinical tumor volume (CTV) margins and depth dose prescription.

Regarding dose and fractionation, indisputably patients will benefit from a hypofractionated and more comfortable schedule, and analyzing the literature data Biological Equivalent Dose (BED) of most treatments is around 65-75 Gy with alpha/beta 10.

Most studies determine the Gross Tumor Volume (GTV) by a delimitation of the clinically visible tumor and then adding a 5-10 mm margin to delimit the CTV, which represents microscopic tumor extension. Dermoscopy is a simple, quick and non-invasive technique that has been shown to increase the diagnostic accuracy in skin tumors. Several studies have demonstrated the usefulness of dermoscopy in the pre-surgical division of BCC, achieving a higher rate of complete tumor resections, and better sparing of peritumoral healthy tissue. In this way, the use of dermoscopy is of great value for the delimitation of BCC prior to radiotherapy, limiting the CTV margin to 5 mm for BCCs. This topic is vital considering the size limitation of applicators.

The determination of the depth of the lesion will determine the prescription dose. Several published studies compare the findings obtained by ultrasonography and histology and identify high rates of concordance between both techniques. By contrast, other studies have found lower rates of concordance. According to these results a safety policy may be to prescribe at 3 mm depth when HFUS measurements give depth lesion values smaller than this value.

Following these considerations the experience with the Valencia applicator has been recently published. The Valencia applicator is a superficial device that improves the dose distribution compared with the Leipzig applicator thanks to a flattening filter. With a hypofractionated regimen of 42 Gy in 6-7 fractions and excellent control rate (98%) was achieved in 45 BCCs in 35 patients.

Nowadays, there is a new radionuclide-free approach for NMSC, the HDR surface electronic brachytherapy (EBT). Currently there are three EBT systems for treatment of surface lesions: the 50 kVp Xoft Axxent® (iCad, San Jose, CA), the 50 kVp Zeiss INTRABEAM® (Carl Zeiss Surgical Gmbh, Oberkochen, Germany), and the most recent 69.5 kVp Esteya® (Elekta Brachytherapy, Veenendaal, The Netherlands), provided with 1 cm to 3 cm diameter applicators.

Compared to the Valencia applicator, Esteya® provides better penumbra, very small leakage, less shielding requirements and significantly shorter treatment time. Taking into account the Valencia applicator experience a similar protocol has been adopted for the implementation of Esteya®, and early results show 100% of complete response in 23 lesions in 20 patients with at least 6 months of follow-up.

Only one more EBT study has been reported to date, with complete response in 100% at one year in 171 NMSC.

As the control rates, the cosmetic results of the new approaches of skin BT (Valencia app. and EBT) are encouraging, although a longer follow-up and more studies are needed to confirm these preliminary results.

3D IMAGE-GUIDED BRACHYTHERAPY BOOK

SAMPER OTS, P.

University Hospital Rey Juan Carlos. Madrid

The Spanish group brachytherapy (GEB) of the SEOR worked from May 2014 to June 2015, in a book of 3D image-guided brachytherapy. The book has been coordinated by Angels Rovirosa (coordinator of GEB), Elena Villafranca and M. Pilar Samper. In its preparation have been involved more than 60 radiation oncologist and radiation physicists working in brachytherapy.

At present brachytherapy treatments are performed using image techniques as US, CT, MRI and 3D planning. Thus a proper definition of the treatment volumes and an evaluation of the dose to organs at risk are achieved. As a consequence it is allowed an increase in local control with a reduction the side effects.

The book is intended as a practical guide to help professionals dedicated to brachytherapy to improve techniques, share experiences and solve problems in the daily practice. Therefore, the e-book format has been chosen to incorporate numerous images and explanatory videos.

Each chapter describes: the indications, available applicators, the image guided implant procedure, the definition of target volumes and organs at risk, the prescription of the dose, the dosimetry optimization, the recommendations in the evaluation

of Dose Volume Histograms and case problems and solutions. The e-book will be available for all SEOR members at the SEOR website. Currently the book is in layout and probably will be completed by the June 2015 Congress of SEOR.

Acknowledgements: The preparation of the book would not have been possible without the support of ELEKTA® and EDIKA-MED publisher.

CURRENT STUDIES IN GEB GROUP

GUTIERREZ MIGUELEZ, C.

Catalan Institute of Oncology. ICO. Barcelona

The purpose of my short talk is to present the studies of the GEB group (Grupo Español de Braquiterapia).

There are two:

Multicentric study of permanent brachytherapy in younger

Patients with prostate cancer

The main investigator is Dra. Elena Villafranca, from Complejo Hospitalario de Navarra. Other hospitals are also participating: I Onkologikoa, Clínica Universidad de Navarra, HU La FE, H Carlos Haya, Hospital Ramon y Cajal, H Mexoiro, H Infanta Cristina, Institut Català d'Oncologia.The purpose is to evaluate biochemical progression-free survival (BDFS) in men 60 years of age or younger with prostate cancer who underwent exclusive permanent brachytherapy. 528 patients have been included. And the results will be presented during SEOR. It is one of the biggest series at the moment in young men with permanent brachytherapy.

Focal brachytherapy in early prostate cancer

The main investigator is Dra. Cristina Gutiérrez, from Institut Català d'Oncologia. Other hospitals are also participating: *Consorcio Hospitalario Provincial de Castellón, Hospital de Navarra, Hospital Onkologikoa, Hospital Universitario Central de Asturias (HUCA), Hospital Ramón y Cajal, Hospital Carlos Haya, Centro Oncológico de Galicia, Hospital Universitario Marqués de Valdecilla, Hospital Universitari i Politècnic La Fe de Valencia.* The purpose is to evaluate toxicity and biochemical progression-free survival (BDFS) in men with very early prostate cancer who are going to be treated with focal (only the affected lobe) permanent brachytherapy. The study has already the Etical Comitee approval but have not still started the patient accrual.

The GEB is also participating in another multicentric study, about quality of life in men with early prostate cancer, treated with either surgery, active surveillance, external radiotherapy or brachytherapy.

16:30-18:30

TABLE OF ESTRO'S YOUNG SESSION

WHERE WE ARE AND WHERE ARE WE GOING ON RADIATION ONOLOGY SPANISH GROUP

HERNANZ DE LUCAS, R.

University Hospital Ramón y Cajal. Madrid

SYROG is a work group inside SEOR that tries to improve the develop of the formation of the young members of SEOR

I have been the coordinator of this group the last two years and in this session I'm going to make a review of the past, present and in my opinion the future of the group.

It's a session oriented to allthe members of SEOR, but specially to young members, residents and consultants in the first 10 years of their careers.

Clin Transl Oncol (2015) [Extraord. 1] 17:30-31

THE FIVE BEST ORAL COMMUNICATIONS. MEDICIN

UROLOGY

1. HIGH-DOSE RADIOTHERAPY AND LONG-TERM ANDROGEN DEPRIVATION IN LOCALIZED PROSTATE CANCER

Zapatero, A.; Guerrero, A.; Maldonado, X.; Alvarez, A.; González San Segundo, C.; Cabeza, M.A.; Macías, V.; Casas, F.; Pedro Olivé, A.; Boladeras, A.

Background: The optimal duration of androgen deprivation (AD) combined with high-dose radiotherapy (HDRT) in prostate cancer remains undefined. We aimed to determine whether long-term AD (LTAD) is superior to short-term AD (STAD) when combined with HDRT.

Methods: Multicentre, phase 3 randomized trial. Eligible patients had cT1c-T3bN0M0 prostate adenocarcinoma with intermediate- and high-risk factors according to NCCN criteria. 355 patients were randomized to receive 4 months of neoadjuvant and concomitant AD (STAD) plus HDRT (median dose 78 Gy) or the same treatment followed by adjuvant AD for 2 years (LTAD). Stratification was according to risk group. The primary endpoint was biochemical disease-free survival (bDFS). Secondary endpoints included overall survival (OS) and metastasis-free survival (MFS).

Results: From 2005 to 2010, 178 patients were randomized to STAD and 177 to LTAD. After a median follow-up of 63 months, the 5-year bDFS was significantly higher among patients receiving LTAD (90% vs. 81%; HR 1.88 95% CI 1.12-3.15; p=0.01). Five-year OS and MFS were also significantly higher in the LTAD group (OS 95% vs. 86%; [HR 2.48 95% CI 1.31-4.68; p=0.009] and MFS 94% vs. 83%; [HR 2-31 95% CI 1.23-3.85; p=0.01]). Radiation toxicity was similar in both groups. Stratified analysis showed that the benefit in bDFS, MFS and OS was only significant in patients with high-risk disease.

Conclusion: Compared with STAD, 2 years of adjuvant AD combined with HDRT improved biochemical control and overall survival in patients with high-risk prostate cancer. Longer follow-up is needed to determine the benefit from >4 months in intermediate-risk disease.

SBRT

2. SAFETY AND EFFICACY OF STEREOTACTIC BODY RADIOTHERAPY FOR HEPATIC OLIGOMETASTASES: UPDATED 10-YEAR ANALYSIS

Goodman, B.D.; Cárdenes, H.

Purpose: In select patients with oligometastatic liver disease, addition of local therapy may be associated with improved outcomes. We evaluated long-term outcome and toxicity of stereotactic body radiotherapy (SBRT) for liver metastases from solid tumors.

Patients and methods: Eligible patients had 1-3 liver metastases with a maximum sum diameter of 6 cm, without extra-hepatic progression. 81% of patients received prior chemotherapy. We treated 106 lesions in 81 patients; 67% with colorectal primaries (CRC). Median total dose was 5,400 cGy delivered in 3-5 fractions. At least 700 cc of normal liver minus Gross Tumor Volume (GTV) received ≤1,500 cGy.

Results: Median follow-up was 33 months (2.5-70 m). Overall local control was 94%; Kaplan-Meier estimates were 96% at 1 year and 91% at 2, 3 and 4 years. For CRC patients, one-year local control was 94% versus 100% for non-CRC histologies. Two- and three-year local control rates were 89% for CRC versus 92% in non-CRC (p=0.4701). 69% of lesions had partial/complete response, 27% stable disease and less than 3% progressed. Median dose for responders was 5,400 cGy versus <5,000 cGy in non-responders. Median survival time was 33.6 months (29.1-38.4 m). Kaplan-Meier survival estimates at 1, 2, 3 and 4 years were 89.9%, 68.6%, 44.0%, and 28.0%, respectively. Grade 3 or greater liver toxicity was observed in 4/81 (4.9%) patients.

Conclusion: SBRT is effective for select patients with hepatic oligometastases with limited toxicities. A Phase III trial comparing SBRT with "gold-standard" surgical resection is warranted.

BREAST CANCER

3. ACCELERATED HYPOFRACTIONATED CONCURRENT BOOST IN LOCALLY ADVANCED BREAST CANCER

Cabezón, M.A.; Lloret, M.; Henríquez-Hernández, L.A.; Rodríguez-Ibarria, N.; Pinar, B.; Rodriguez-Melcón, J.I.; Garcia; Cabrera, L.; Blanco, J.; Marban, M.; Lara, P.C.

Purpose: To evaluate the role of whole-breast radiotherapy with an accelerated hypofractionated concurrent boost (CB) to tumor bed in local control and survival of locally advanced breast cancer patients treated with neoadjuvant chemotherapy (NACT) and conservative surgery.

Methods: 157 locally advanced breast cancer patients were prospectively included in this prospective study from 03/2007 to 08/2012. At diagnosis, 137 patients had stage II (72%) and 34 had stage III (21.6%) tumors. Thirty-nine cases were classified as Her2-enriched and triple negative tumors. After NACT and conservative surgery, tumor was completely resected in 130 cases, and 27 patients had high risk margins (≤1 mm). All patients were prescribed to receive a total radiation dose to tumor bed of 58.75-63.45 Gy in 25-27 fractions at 235 cGy/fraction over 5 weeks, depending on proximity of surgical margins. Nodal irradiation was prescribed to pathological node positive patients and was delivered by standard fractionation. The CTCAE 4.03 scale was used to evaluate the radiation-induced toxicity. The follow-up was closed in December 2013.

Results: After a mean follow-up of 46.9 months, there were 3 local relapses and 13 distant relapses. Eight patients died of the disease. Five-year actuarial local disease-free survival was 96.3%. The most frequent late effects were cutaneous hyperpigmentation grade 2 (13.4%) and subcutaneous induration grade 2 (11.5%).

Conclusions: High risk breast cancer patients could be safely treated with whole-breast irradiation with an accelerated hypofractionated concurrent boost to lumpectomy cavity, a treatment schedule that reduces the total duration of the treatment to 5 weeks.

4. HYPERFRACTIONATED-ACCELERATED RADIOTHERAPY FOR BREAST CANCER. THE ROLE OF TUMOUR REPOPULATION

Carmona-Vigo, R.; Rodriguez-Ibarria, N.; Cabezón, A.; Henríquez, L.A.; Pinto, W.; Pinar, B.; Lloret, M.; Lara, P.C.

Aim: To evaluate the role of high dose radiotherapy in local control of the disease by hyperfractionated-accelerated scheme in those patients resistant to neoadjuvant systemic therapy. Tumour repopulation during radiotherapy could influence clinical outcomes.

Material and methods: One hundred-eighty four patients were included in this prospective study from 1991-2011. Whole breast was treated to a dose of 60 Gy, 1.2 Gy/fraction, two fractions/day, followed by a boost of 21.6 Gy to a total dose of 81.6 Gy in seven weeks. Tumour repopulation was estimated in pretreatment biopsies by Ki67 immunostaining. Both clinical response and toxicity were evaluated during follow-up, closed in December 2013.

Results: 177 patients were evaluable for response with a mean follow-up of 132 months. The local relapse-free survival at 5, 10 and 15 years was 85.6, 82.2 and 82.2%, respectively, while the overall survival was 52.8, 34.5 and 23.3%, respectively. The radiation dose received was a determining factor for local control of the disease. Patients (37 cases) showing higher tumour repopulation (Ki67 above the median: 14%) had lower local control figures than slowly proliferating tumours (40 cases) (62% vs 84,6% at 15y; p=0,028).

Severe late toxicity was modest, specially with treatment delivered by modern thecniques.

Conclusions: Hyperfractionated-accelerated radiotherapy is an effective and safe therapeutic alternative for those patients with locally advanced breast cancer unresponsive to neoadjuvant systemic therapy. Tumour repopulation estimated by Ki67 and total dose administered are the most important factors predicting local control.

TRANSLATIONAL RESEARCH

5. RADIOTHERAPY GETS IMPROVED BY A NANOTECHNOLOGY-BASED ENZYME THERAPY

Fernández Fornos, L.; Barberá, V.M.; García-Morales, P.; Sanz, J.; Fuentes, M.; Saceda, M.; Ventero, M.P.; Espósito, D.; Dorado Rodriguez, P.; García Miragall, E.

Purpose: Our principal aim is to increase radiotherapy effects in chemo-radiotherapy resistant tumors, specially glioblastomas and exocrine pancreatic carcinomas using as potentiator agent the enzyme D-Aminoacid oxidase (DAO) inmovilized in nanoparticles of different nature.

Material and methods: Primary cultures and stablished cell lines obtained from glioblastoma and exocrine pancreatic carcinomas, are irradiated (7-15 Gy) using a Varian 2100CD linear accelerator. After irradiation cells are incubated in the absence or in the presence of DAO (free or inmovilized in nanoparticles) and D-alanine (enzyme substrate). After 24-48 h after irradiation cells are harvested and cell cycle distribution is determined by flow citometry.

Results: We have demonstrated in primary cultures obtained from glioblastomas, that the treatment with DAO after irradiation, potentiates dramatically the effect of the radiation alone, increasing especially the percentage of cells in the sub-G1 phase, an indicator of cell death. Some representative results are included in the attached file. DAO inmovilized in magnetic nanoparticles is more effective than free enzyme, since DAO is more stable at 37º C inmovilized in nanoparticles.

Conclusions: Our results suggest that radiotherapy effects could be improved by the addition of a nanotechnology-based enzyme therapy with DAO. The potentiation effect is probably due to the increase in free radicals produced by both, the radiation and the DAO activity.

Clin Transl Oncol (2015) [Extraord. 1] 17:32-198

ORAL COMMUNICATIONS

BREAST CANCER

18-MONTH EXPERIENCE WITH INTRAOPERATIVE ELECTRON-BEAM RADIOTHERAPY (IORT) IN A SPECIALIZED OPERATING ROOM IN THE HOSPITAL CLINIC OF BARCELONA

Valduvieco, I.; Farrús, B.; Llorente, R.; Solá, J.; Camacho, C.; Alonso, I.; Caparrós, X.; Escudero, E.; Santamaría, G.; Biete, A.

Objective: Analyze the 18-month experience with intraoperative electron-beam radiotherapy (IORT) in a specialized operating room in the Hospital Clinic of Barcelona.

Material and method: The IORT program was initiated in July 2013. A prospective database was created registering: diagnosis, initial indication for exclusive or boost IORT, outcome, secondary effects at 2, 6 and 12 months and repercussion in the reduction of external radiotherapy sessions.

Results: From July 2013-January 2015, 102 patients were potential IORT, but 48 breast cancer (BC) were excluded for different causes. Finally 54 IORT treatments were performed in 51 patients with BC and 3 Gynecological. Patient characteristics BC: The pre-surgical IORT indication was exclusive with low risk ASTRO criteria in 36/51 (76%). On definitive pathological study, 11 were considered as boost due to tumour characteristics (size >2 cm, CIS extensive, positive lymph nodes or HG3). Mean age of exclusive IORT 73±9 y (60-89) and of boost (n=26) 65±12 y (40-90) (p=0.007). Energy 4-10 MeV, 6MEV (28%), cylinder diameter 4-7 cm, 5 cm (38%). Tolerance: 49 patients were evaluated: 81% asymptomatic with no pathological signs (2-13 m). We observed secondary effects attributable to IORT/surgery in 19%. No local recurrence was observed. Based on the fractionation schedule had used with external RT (hypo vs. normal fractionation) 465-705 sessions were avoided in the linear accelerator.

Conclusions: After 18 months of experience our overall results are very satisfactory, with no local recurrence or local toxicity being reported. We detected a technical limitation in small breasts, superficial tumors or surgery with a circular scar.

3D-FORWARD RADIOTHERAPY FOR LEFT BREAST CANCER AND PERICARDITIS

Sala Elarre, P.; Arbea Moreno, L.; Ramos, L.I; Zubiri Oteiza, L; Moreno Jiménez, M.; Cambeiro Vázquez, M.; Aristu Mendioroz, J.; Valtueña Peydró, G.; Olarte García, A.; Martínez Monge, R.

Acute pericarditis during breast standard radiotherapy is uncommon. Dose constraints for the pericardium and the heart are not well defined. The objective of the study is to compare the dose volume histograms (DVH) of the pericardium and heart in left breast cancer patients treated with 3D-Forward hypofractionated radiotherapy (50.54 Gy/19 Rx) who developed acute pericarditis (n=4) with a control group (n=11).

Materials and methods: The pericardium was defined by expansion of the heart volume by 0.5 cm. We analyzed the DVHs of the heart and pericardium of patients with left breast cancer treated in our center. Dmean, Dmax, D5 and V5 to V45 at 5-Gy intervals were calculated. A Wilcoxon U-Mann-Whitney test was applied to compare both groups.

Results: The Dmean, V5, V10, V15, V20, V25 and V30 Gy in the pericardium were significantly higher ($p<0.05$) in women with pericarditis (8.7 Gy vs 4.6 Gy; 38.3 vs 17.7; 26.2 vs 10.8; 21.6 vs 8.4; 17.6 vs 7.0; 14.9 vs 5.8; 11.4 vs 4.7; respectively). The Dmean, D5, V5, V10, V15, V20, V25 and V30 Gy in the heart were significantly higher ($p<0.05$) in women with pericarditis (6.2 vs 2.2; 24.3 vs 6.0; 29.8 vs 6.0; 19.1 vs 2.3; 14.6 vs 1.5; 9.2 vs 1.0; 5.7 vs 0.8; 3.3 vs 0.5; respectively).

Conclusions: Dmean and the volume of heart and pericardium receiving 5 to 30 Gy of radiotherapy are dosimetric surrogates of pericarditis when 3D-Forward hypofractionated radiotherapy (50.54 Gy/19 Rx) is used.

A RETROSPECTIVE ANALYSIS OF TREATMENT AND OUTCOME IN CDIS PATIENTS

Casasús Farré, M.; Nicolau Martorell, C.; Mestre Mestre, F.J.

In recent publications it is discussed the benefit of radiotherapy for good-risk patients with ductal carcinoma in situ (CDIS). We analyse the treatment and outcome in patients treated in our institution.

Methods: 38 patients visited between February 2003 and August 2008 are included in the present analysis. Whole breast irradiation was delivered in 36 patients (94.7%) with conventional fractionation (50 Gy, 2.0 Gy/day, 25 fractions), followed by tumor bed boost in 14% of them. 2 patients did not receive radiotherapy because mastectomy was done. Local (LF) and contralateral failure (CF) were examinated.

Results: Median follow-up time was 8.3 years (range 5 to 11.7 years). The median tumor size was 15.6mm (3 mm-50 mm), and histological grades were 23.7% grade 1, 39.5% grade 2 and 36.8% grade 3. 1.9% patients had positive margins and 3% close margins (<2 mm). 1 of 36 treated patients had LF at 4 years of follow-up. It was a grade 1 tumor of 50 mm, with positive margins and no boost was delivered. 1 mastectomized patient made CF at 45 months of primary surgery.

Conclusion: Even that our series is limited, we can conclude that the benefit of radiotherapy would be because of the whole breast irradiation more than the addition of the boost in case of CDIS.

¿ARE ALL PNEUMONITIS IN BREAST CANCER DUE TO RADIATION THERAPY?

Candini, D.; De la Pinta, C.; Hernanz, R.; Fernández, E.; Sancho, S.; Muñoz, T.; Ramos, A.

Objective: To describe an uncommon cause of pneumonitis in a patient receiving multidisciplinary treatment for breast cancer.

Materials and methods: We present the case of a 54-year-old woman, diagnosed with a right breast ductal infiltrating carcinoma pT1aN0M0 with negative hormone receptors and positive HER2. Lumpectomy was performed, and adjuvant treatment with paclitaxel-trastuzumab for 12 weeks with subsequent trastuzumab for one year was suggested, and at the same time the patient was treated with partial breast irradiation, with 10 fractions of 3850 cGy, twice a day. After completion of taxol, the patient started trastuzumab at full dosage. A few days later, she was admitted with sudden dyspnea and coughing, without expectoration or fever. Bilateral pulmonary opacities were ob-

served in a x-ray. There were no significant blood alterations. The patient had a torpid evolution, and therefore a CT scan was performed, which revealed a bilateral alveolar infiltrate suggestive of toxic pneumonitis. A lung biopsy showed an organized pneumonia, also consistent with the suspicion of toxic pneumonitis.

Results: Treatment with trastuzumab was withdrawn, and the patient started treatment with corticosteroids (1 mg/kg) with significant clinical improvement and almost complete resolution of the alveolar infiltrate in a control CT scan.

Conclusions: Trastuzumab pneumonitis is a rare disease, although some cases have been described in the literature. The diagnosis is made after excluding infectious and autoimmune disorders, as well as other toxicities. It has to be suspected in patients receiving therapy with trastuzumab, who present with respiratory symptoms and a bilateral alveolar infiltrate.

¿ARE WE IRRADIATING THE AXILLA WITH TANGENTIAL FIELDS IN BREAST?

Manterola Burgaleta, A.; Asin Felipe, G.; Dominguez Dominguez, M.A.; Campo Vargas, M.; Errasti Viader, M.; Barrado Los Arcos, M.; Visus Fernandez de Manzanos, I.; Rico Oses, M.; Fuentemilla Urío, N.; Martinez Lopez, E.

Objective: Treatment of the axilla is evolving in recent years. The study ACOSOG Z0011 conclude that is not necessary axillary lymphadenectomy in patients with 1 or 2 positive sentinel nodes provided you have treated the breast with two tangentials fields, probably because you are including the level I of the axilla. The purpose of this study is to evaluate the volume of level I included in patients treated for breast cancer with two tangential fields in our institution.

Material and methods: We reviewed 20 patients recently treated at our institution with two tangential fields and 3D planning. The volume of the breast and axillary level I, as well as other factors that might relate to the inclusion of greater volume of the axilla in the fields are analized, as the size of the breast, angle of the inner tangencial beam and distance from the breast to the end of the clavicle's head. Level I with receive the 95% and 50% of the prescribed dose the breast is measured.

Results: The percentage that received 95% of the prescribed dose varies between 0% and 58.5%. Between 9.8% y 81% of the level I receive the 50% of the prescribed dose. A small distance from the clavicle head and the superior edge of the breast is related to better coverage of the axilla.

Conclusions: Axillary level I is not properly treated with tangential fields.

ACCELERATED HYPOFRACTIONATED CONCURRENT BOOST IN LOCALLY ADVANCED BREAST CANCER

Cabezón, M.A.; Lloret, M.; Henríquez-Hernández, L.A.; Rodríguez-Ibarria, N.; Pinar, B.; Rodriguez-Melcón, J.I.; Garcia-Cabrera, L.; Blanco, J.; Marban, M.; Lara, P.C.

To evaluate the role of whole-breast radiotherapy with an accelerated hypofractionated concurrent boost (CB) to tumor bed in local control and survival of locally advanced breast cancer patients treated with neoadjuvant chemotherapy (NACT) and conservative surgery.

Methods: 157 locally advanced breast cancer patients were prospectively included in this prospective study from 03/2007 to 08/2012. At diagnosis, 137 patients had stage II (72%) and 34 had stage III (21.6%) tumors. Thirty-nine cases were classified as Her2-enriched and triple negative tumors. After NACT and conservative surgery, tumor was completely resected in 130 cases, and 27 patients had high risk margins (≤1 mm). All patients were prescribed to receive a total radiation dose to tumor bed of 58.75-63.45 Gy in 25-27 fractions at 235 cGy/fraction over 5 weeks, depending on proximity of surgical margins. Nodal irradiation was prescribed to pathological node positive patients and was delivered by standard fractionation. The CTCAE 4.03 scale was used to evaluate the radiation-induced toxicity. The follow-up was closed in December 2013.

Results: After a mean follow-up of 46.9 months, there were 3 local relapses and 13 distant relapses. Eight patients died of the disease. Five-year actuarial local disease-free survival was 96.3%. The most frequent late effects were cutaneous hyperpigmentation grade 2 (13.4%) and subcutaneous induration grade 2 (11.5%).

Conclusions: High risk breast cancer patients could be safely treated with whole-breast irradiation with an accelerated hypofractionated concurrent boost to lumpectomy cavity, a treatment schedule that reduces the total duration of the treatment to 5 weeks.

ACCELERATED PARTIAL BREAST IRRADIATION WITH INTRABEAM®: REVIEW OF EARLY EXPERIENCE

Pinar, B.; Rodríguez-Ibarria, N.; Cabezón-Pons, M.A.; Macías-Verde, D.; Morera, A.; Miralles, M.; Rosas, C.; García-Cabrera, L.; Lloret, M.; Lara, P.C.

Targeted intraoperative radiation therapy (IORT) as an alternative to whole breast irradiation (WBI) has been described for patients with early-stage breast cancer with a treatment duration reduction. It offers an excellent precision leading to normal tissue sparing without risk of tumour-site miss.

Methods: From January 2013 to February 2015, 120 patients with invasive breast cancer 6 months follow-up, only grade I-II asymptomatic chronic induration is present in 24%.

Conclusions: IORT using Intrabeam® is a feasible and promising alternative to conventional external fractionated radiotherapy in selected patients, and it is well tolerated with low morbidity.

AUTE TOXICITY BETWEEN WBI AND SIB FOR 3D-CTR BREAST CANCER

De Las Peñas Cabrera, M.D.; Samper Ots, P.M.; De La Casa De Julián, M.A.; Amaya Escobar, E.; Seguro Fernandez, A.; Garcia Marcos, R.; Hernandez Miguel, M.

Objective: Compare dose-volume histograms for the organs at risk and its correlation with acute toxicities in radiotherapy treatment breast cancer, whole breast irradiation (WBI) without boost, and breast with simultaneous integrated boost (SIB).

Methods and materials: Adjuvant treatment after breast-conserving surgery represented 26.48% (143/150) of 540 new patients. From them, a 37.76% (54/143) were pN0. Patients were evaluated from January to December 2014. The fractionation scheme was 2.0 Gy per fraction for WBI and 2.4 Gy for SIB. Treatment planning was carried out using XiO TPS. The following parameters were recorded and evaluated for both treatment schemes. Skin dose D5 cc, D15 and D50 cc were recorded as possible independent influence confounding variable and correlations with radiation dermatitis, pigmentation, pain treatment and pruritus. CTCAE v4.0 toxicity score at the end of the treatment and at 1 and 6 months of follow up were also evaluated. Significance statistical level was previously set at 95% level ($p<0.05$).

Results: From the 54 patients, 19 (35.18%) had WBI and 35 SIB (64.81%). There were statistical significant differences in the rate of radiation dermatitis at the end of the treatment: G1 [SIB

85.71% (30/35) vs WIB 89.47%] and G2 [14.28% vs 5.26%]. And at 1 month of follow up was G1 [SIB15/35 (42.85%) vs 7/19 (36.84%)] and G2 [2/35 (5.74%) vs. 0].

Conclusions: Acute skin toxicity was with the SIB was a significant difference at the end and at 1 month but not at 6 months.

ADJUVANT RE-IRRADIATION CHEST WALL BED AFTER BREAST CANCER RELAPSE WITH VMAT

Soler, P; Morales, J.C.; García, V.; Andreu, F.; Tortosa, R.; Chinillach, N.

Introduction: The radiation therapy in a previously treated area still remains a challenge nowadays. VMAT technique allows an accurate dose coverage of the PTV are.

Objectives: To suggest a treatment chance in a previous irradiated area, in a difficult location with a prothesis reconstruction of the sternum in the relapse bed.

Methods: A 62 year old patient diagnosed with breast relapse after breast conserving surgery received whole breast irradiation 20 years ago. In the follow up, a 4 cm mass relapse, was seen, in LICI of the left breast, affecting the sternum bone infiltration. The patient underwent radical left mastectomy, A.P: lobulillar breast carcinoma with periostium infiltration. Adjuvant Radiotherapy was delivered as described below: Radiotherapy schedule: VMAT technique was used. Image fussion PET-CT simulation. From 25 of November 2014 till 5 of January 2015 (2 Gy/fraction), 25 sessions. PTV: Bed area + margin.

Results: No second effects were seen after radiation therapy.

Conclusions: We conclude that, VMAT technique allows an accurate treatment in difficult treatment areas, so that re-irradiation can be a reality.

ADVANCES IN BREAST CANCER REIRRADIATION: A CASE REPORT

Pérez Montero, H.; Murillo González, M.T.; Prados Losa, R.; Chávez Jiménez, T.C.; Colmenero Hernández, M.; Guardado Gonzales, S.G.; Campos Bonel, A.; Asiain Azcárate, L.; Sanz Fernández, A.A.; Pérez-Regadera, J.F.

Objective: Axillary recurrence is a rare but not uncommon form of recurrence in breast cancer that will increase its incidence. Currently, the ideal treatment of axillary recurrence is controversial, especially in patients previously irradiated.

Material and methods: We present a case report of a female patient aged 68 operated by hookwire biopsy of an infiltrating ductal carcinoma of the right breast. She received radiotherapy (breast and regional lymph nodes) planned by 2D image. At that time no axillary dissection was performed because of anesthetic contraindication. She was disease free for 13 years when she referred pain and lymphedema in the right arm. A single axillary recurrence was discovered and a lymphadenectomy was made with inability to resect completely the lesion.

Results: Being a patient previously radiated, there was a considerable risk of developing toxicity. Because of that we decided to treat by Volumetric Modulated Arc Therapy planned by PET-CT for better optimization of the dose. Such planning was carried out with adjustment of dosimetry based on previous treatment.

Conclusion: Technological advances make it possible to re-radiate patients who previously we couldn't. It extends and improves the therapeutic options for patients and the indications of radiotherapy itself. This is due to better treatment planning because of the use of new imaging techniques and the ability to provide better dose conformation at the time of treatment. The presented case illustrate the above, and also the enormous treatment changes that have taken place in a short time lapse, and the vast possibilities that will be open in the future.

ANALYSIS AND RESULTS FOR RADIOTHERAPY AS PART OF BILATERAL BREAST CANCER TREATMENT

Jiménez Domínguez, M.; Peracaula Espino, F.J.; Del Castillo Acuña, R.

Objetives and purpose: The incidence of clinically observed breast cancer is high enough, but not also for bilateral breast tumors. In this paper we examine the feasibility of breast-conserving therapy for bilateral breast cancer, present our radiation therapy technique and analyze the ICRU dosimetric parameters.

Material and methods: Between January 2006 and October 2014, a total of 609 patients with breast cancer were treated with breast-conserving surgery followed by radiation therapy at our Department. Among them, 11 patients (1.8%) had bilateral breast cancer (10 had synchronous cancer and 1 case had metachronous tumor). Eight patients with simultaneous breast cancer were treated by matched midline technique with bilateral tangencial fields without overlapping. Following breast conserving surgery, was delivered a total dose of 42.56 Gy (for 5 patients) and 50 Gy (for 6 patients) in daily fractions of 2.66/2 Gy was delivered over 4/5 weeks to the whole breast via 6 MV photons for tangential fields.

Results: The analysis of dosimetric constraints for the risk organs of the 11 breast cancer. The results of ICRU dosimetric parameters are summarized.

Conclusions: Target coverage should generally not be compromised to reduce the normal tissue risks. For many patients with breast cancer the risk of pericarditis or symptomatic pneumonitis may limit the homogeneity index (HI) for tumor control. In this study we demonstrate that it´s possible to get a good homogeneity and coberture of the PTV without a normal tissue complication, even for bilateral breast tumors.

ANGIOSARCOMA OF RADIATION-INDUCED BREAST: REPORT OF A CASE

Casado, M.; Murillo, M.; Martin, M.; Gil, B.; Campos, A.; Pérez, H.; Guardado, S.; Gascón, N.; Bartolomé, A.; Pérez- Regadera, J.F.

Introduction: Angiosarcoma is a cancer of the inner lining of blood vessels, and it can occur in any area of the body.

Report case: On July 2002 a 79 years female patient asked for a palpable node in left breast. She was diagnosed of infiltrating ductal carcinoma G2 luminal A (pT2N0M0) treated with lumpectomy, chemotherapy (CMFx6 cycles) and hormonal therapy. Radiotherapy was administered at left breast: 4600 cGy and boost of 6600 cGy. On February 2014, after follow up of 11 years, the patient referred to a soft lump in left breast (in a site previously radiated) with skin in violet colour. Ultrasound with PAAF: carcinoma. March 2014: mastectomy. AP: high-grade angiosarcoma, MIB-1: 40%. May 2014: local recurrence with multiple nodules in the mastectomy scar. No distant metastases. The patient has initiated chemotherapy with paclitaxel. Currently the patient is in local progression 3rd line chemotherapy. Review of the literature: Angiosarcoma occurs either spontaneously without obvious precipitating factor or after irradiation under conservative treatment of breast cancer in older women. The most widely known cause of angiosarcoma is lymphedema. Absolute risk of secondary angiosarcoma after radiotherapy for breast cancer is estimated to be <0.5%. Diagnosis is often difficult. Prognosis is very derogatory, only early surgery offers hope for longer survival.

Conclusion: Angiosarcoma of radiation induced breast cancer is a rare tumour and the risk of local recurrence and metastasis

after surgery is high. The role of chemotherapy and radiation therapy remains to be demonstrated.

APBI WITH SBRT AND GATING IN BREAST CANCER PATIENTS

Ciérvide, R.; García-Aranda, M.O.; Valero, J.; López, M.; Montero, A.; Hernando, O.; Sánchez, E.; Alonso, R.; Potdevin, G.; Rubio, M.C.

Purpose: Asses the feasibility of applying SBRT with Gating in patients with breast cancer of very good prognosis with 5 fractions of 6 Gy in alternate days. Reduce the PTV margin by quantifying the breast movement during the respiratory cycle (RC) and to irradiate in a selected phase of that cycle. Identify and quantify toxicity and cosmesis.

Material and methods: Patients with ≥60 years, pT1 breast tumor after breast conserving surgery, surgical margins ≥2 mm, pathological confirmation of infiltrating ductal carcinoma, grade 1-2, pN0, ECOG 0-1 and luminal subtype are enrolled.; A gold fiducial marker is placed close to the surgical bed. CT simulation is done in supine position with an immobilization device and infrared spheres on the skin, as external fiducials. The radiation treatment is planned with iPlan Net® and DVH are assessed according to ASTRO recommendations for PBI constraints. During treatment delivery, PTV intrafraction motion is controlled with Novalis Exactrac Gating System and PTV is irradiated in a selected gated area of the RC. Clinical and toxicity outcomes are assessed periodically.

Results: A total of 16p, median-age 72 years-old (range 60-86) were included. Median tumor size 1.25 cm (range 0,5-2 cm). 9 cases were right breast and 7 left side. Mean PTV was 96.9 cc. Mean ipsilateral lung V9 was 2 Gy. With a median follow-up of 9.6 months, 100% of the sample is free of disease without toxicity and excellent cosmetics from patient and physician point of view.

Conclusions: APBI with SBRT and Gating is not only feasible but also very well tolerated and accepted.

ATOLL SIGN IN BRONCHIOLITIS OBLITERANS ORGANIZED (BOOP) AFTER BREAST RADIOTHERAPY

Sanmamed Salgado, N.; Rubí Olea, L.; Herrera Román, M.; Del Valle Rivero, M.L.; Sánchez Belda, M.; Alonso Martínez, P.; Diezhandino García, P.; López Pedreira, M.R; Cartón Sánchez, P.; López-Lara Martín, F.

Objectives: Describe atoll sign in a case of BOOP after radiotherapy in breast.

Material and methods: 54-year-old woman with a precedent of breast cancer, treated with conserving surgery, radiation therapy (50 Gy with standard fractionation) and hormone therapy. After four years she consulted by dyspnea, cough and fever for two weeks of evolution. It was treated as flu-like syndrome but in the absence of improvement it was decided hospitalization for study. The chest x-rays showed an alveolar infiltrate and air bronchogram. After discarding tumor or immune origin, she was diagnosed with pneumonitis postradica and started corticosteroid treatment at high doses.

Results: The patient improved clinical and analytical, with disappearance of the pulmonary infiltrates after a year of treatment.

Conclusions: Bronchiolitis obliterans organized syndrome (BOOP) is a complication that is observed in approximately 2% of the patients irradiated for breast cancer with conservative treatment, usually during the first year after treatment. They usually present patchy consolidation and ground-glass opacity. It is very characteristic, although not pathognomonic, the atoll sign or "halo invested". These patterns often appear outside the radiation field. An immunologic reaction mediated by eosinophils, neutrophils, and lymphocytes may be responsible for the development of this syndrome. Therapy with systemic steroids at doses between 0.5-1 mg/kg day is very effective. In recent studies factors like age >50 and hormone therapy increase the incidence of this syndrome.

BMI EFFECT ON SUPRACLAVICULAR IRRADIATION

Sabater, S.; Gutiérrez-Pérez, M.; Gascon, M.; Berenguer, R.; Jimenez-Jimenez, E.; Fernandez-Lopez, J.; Lopez-Honrubia, V.; Andres, I; Donovan, E.; Arenas, M.

Introduction: SCI for breast cancer has shown large variations in design and dose point prescription, different dose prescription methods could produce different homogeneity levels in patients with different body mass index (BMI).

Purpose: To determine the best SCI approach according to the BMI.

Material and methods: Three plans were generated for 24 breast cancer patients, categorised between overweight-obese (O/O) or normal (N) with a cut-off BMI of 25. The first (Isoplan) was an optimized CT plan, the second (3 cmplan) was the same plan prescribed at 3 cm-depth, and the last plan (1 fieldplan) was only an anterior field prescribed to the same fixed-depth dose. The goal was to deliver ≥90% prescribed dose to ≥98% PTV. DVH parameters analyzed: PTV (Dmax, D105%, D95%, Dmean), ipsilateral lung (Dmax, V20 Gy), body (V40 Gy), conformity index (CI=v95%PTV/volPTV), homogeneity index (HI=(D5%PTV-D95%PTV)/Dprescribed).

Results: Mean BMI, 26.91. Ten patients were normoweight, mean BMI 22.58 and, 14 patients were overweight/obese, mean BMI 29.29. Mean PTV volume, 47.91 cc (n, 43.31 cc; o/o, 51.2 cc; p=NS). All DVH parameters analysed differed significantly (all p<0.005) according to the plan. Table shows DVH mean values according to the type of irradiation plan and according to the body habitus.

Conclusions: The Isoplan produced better PTV coverage, but slightly increased lung irradiation and the "irradiated volume" (V40 Gy). There are no clear differences when comparing the PTV parameters according to the BMI. Lung Dmax appeared significantly different according to the BMI. An unsignificant large irradiated volume was observed among O/O patients.

BOOST RADIOTHERAPY IN DUCTAL IN SITU BREAST CANCER BALANCE LOCAL CONTROL DESPITE THE HIGHER RISK DISEASE IN THIS GROUP

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Background: Boost radiotherapy improves outcomes in patients with invasive breast cancer, but whether this is applicable to patients (pts) with pure ductal carcinoma in situ (DCIS) is unclear. This retrospective study examines outcomes from whole breast RT (WBRT), with or without boost, in a women's cohort with pure DCIS treated with breast-conserving surgery (BCS).

Patients and methods: Data from 646 pts treated from 1993 to 2014 in two Institutions (n=518) during all study's period, and twelve more Hospitals (n=128) from 2005. The two treatment groups are compared using the log-rank test. Kaplan-Meier local control analyses and Cox regression analyses are performed.

Results: Median follow-up (FU) is 8.8 years. B-RT pts are 394 (61.0%), noB-RT are 247 (38.2%). Local risk recurrence variable's are compared related to B-RT, no B-RT treatment: age, size, mar-

gin status, nuclear grade, necrosis. Age: ≤45 y: 18% B-RT vs. 11% noB-RT, >65 y: 10% B-RT vs. 20% noB-RT (p=0.001). Size (mm): ≤10: 51% B-RT vs. 41% noB-RT; >20: 21% B-RT vs. 25% noB-RT (p=0.024). Nuclear Grade: 2: 24% B-RT vs. 15% noB-RT; 3: 51% B-RT vs. 56% noB-RT (p=0.049). Margin status (mm): Positive or ≤2: 54% B-RT vs. 48.8% noB-RT (p=0.001). Necrosis: Absent: 29% B-RT vs. 29%; Present: 46% B-RT vs. 46% noB-RT (p=0.992). Local Recurrence (LR): 12% (47/394) B-RT vs. 7% (18/247) noB-RT (p=0.112). Kind of recurrence: CDIS: 43% B-RT vs. 56% noB-RT; Invasive (Inv): 57% B-RT vs. 44% noB-RT (p=0.347). Alive disease free: 521 pts (80.7%);4 pts have a LR combined with contralateral recurrence (CLR);21 pts (3.3%) have a CLR; 2 pts have a LR and a second tumour; 1 pt with CLR and second tumour;1 pt with Inv regional disease; 1pt with liposarcoma in ipsilateral breast with lung metastases. Deaths: 3 pts (0.5%) after anInvLR; 3 pts (0.5%) after an Inv CR;20 pts from other causes; 9 pts are lost of FU.

Conclusions: This large, population-based series of pts with DCIS treated by BCS and WBRT with long-term FU confirms that B-RT outweighs the higher risk disease linked with age, size, positive margins and nuclear grade.

Acknowledgment: Carol Jiménez (Biostatistics).

BRAIN METASTASIS IN A LOW GRADE PHYLLODES TUMOR

Sanmamed Salgado, N.; Rubí Olea, L.; Herrera Román, M.; Sánchez Belda, M.; Alonso Martínez, P.; Del Valle Rivero, M.L.; Diezhandino García, P.; Nieto Sanz, J.; Garavís Vicente, M.I.; López-Lara Martín, F.

Objective: Analysis of breast phyllodes tumors behavior.

Material and methods: 67-year-old woman diagnosed with a low grade breast phyllodes tumor in 2003, which was treated with local resection. After one year she presented local recurrence with sarcomatous transformation so it was a radical mastectomy. Pulmonary metastases appeared in 2007 and these were treated with metastasectomy and subsequent chemotherapy. In 2014, she was hospitalizated by a hemorrhagic stroke with underlying tumor. The lesion biopsy results were compatible with phyllodes tumor metastasis with sarcomatous transformation. It was derived to our service to assess treatment with radiotherapy. She received external beam radiation holocranial with palliative intent, with 6Mv photons, 3 Gy per session to reach a dose of 30 Gy.

Results: Tolerance to treatment was good, experiencing slight improvement at the symptomatic level.

Conclusions: Phyllodes tumor is an entity derived from connective tissue, which is 0.5 to 1% of breast tumors. Up to 25% may suffer sarcomatous transformation with aggressive behavior. It spreads quickly and metastasize to lung, pleura, bone and liver. Central nervous system involvement is unusual, cases cited in the literature are uncommon. A good pathological identification is important (benign, borderline and malignant) as a prognostic factor. The surgical treatment of choice and the role of the adjuvant treatment is not clear. Some authors consider that the extent of the surgery and the use of complementary radiotherapy could improve survival in patients with high risk of reocurrence.

BREAST CANCER MOLECULAR SUBTYPE DETERMINATION USING MAMMOGRAPHIC TEXTURE FEATURES

Díez-Presa, L.; Torrents-Barrena, J.; Gascón, M.; Latorre-Musoll, A.; Puig, D.; Arenas, M.

Purpose: To determine molecular subtypes of breast cancers using texture-feature-driven machine learning techniques on mammographic images.

Materials and methods: We used mammograms of 61 ductal carcinomas (grade 2-3, median age 60, mean tumor size 28 mm). A physician defined a 100×100 ROI around tumors on mammographic images. Extraction of texture features was performed using three independent descriptors: Local Binary Patterns (LBP), Histogram of Oriented Gradients (HOG) and Gabor Filter (GF). Then, a supervised classification was applied using two independent classifiers: K-Nearest Neighbors (KNN) and Support Vector Machines (SVM) (both linear- and radial-type). Both classifiers were trained to identify the molecular subtype (Luminal A, Luminal B (Her2-), Luminal B (Her2+), Her2+, Basal Like and carcinoma in situ) using the first 38 mammograms. We assessed the accuracy of our machine learning technique using the last 23 mammograms.

Results: Accuracy of SVM-R classifier was 52% irrespective of the texture descriptor we used. SVM-L/KNN classifiers achieved an accuracy of 48/39, 35/30 and 21/35% for LBP, HOG and GF descriptors. When simplifying the classification problem to only two subtypes, Luminal A and Luminal B (Her2-), classifier accuracies astonishingly improved. SVM-R accuracy was 75% irrespective of the texture descriptor and SVM (L)/KNN accuracies were 38/75, 50/50 and 63/75% for LBP, HOG and GF.

Conclusions: Our texture-feature-driven machine learning technique provides a reliable classification into molecular subtypes using mammographic images only. Accuracy improves when simplifying to only two subtypes. We expect even better accuracies by increasing the number of patients used for the training stage of our machine learning technique.

BREAST CANCER: RELAPSE AFTER NEOADJUVANT THERAPY, SURGERY AND RADIOTHERAPY

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Objetives: Assess patients diagnosed with breast carcinoma treated with neoadjuvant chemotherapy, surgery and radiotherapy, analyzing prognostic risk factors for local recurrence.

Material and methods: We obtained data from clinical history of patients with Breast Carcinoma treated in our hospital with neoadjuvant chemotherapy, surgery and radiotherapy from 2008 to 2010 in order to assess factors influencing relapse and type of relapse that has occurred. Neoadjuvant chemotherapy was based on the Adriamycin, Cyclophosphamide scheme in most cases.

Results: We treated a total of 89 patients after neoadjuvant chemootherapy and surgery. Mean follow-up was 43 months. 18 relapses have occured (50% local, 16.7% Lymph Node, 22.2% bone, 11.11% Lung and Mediastinum). 50% of cases were Triple Negative, of all these 55% Conservative surgery and 45% Mastectomy). Total relapses were in advanced stage at diagnosis (T2 or more or positive lymph nodes). Infiltrating Ductal Carcinoma in 94.45% of cases, only 1 patient (5.55%) Infiltrating Lobulillar Carcinoma.

Conclusions: Relapse occurred in 20% of cases. Patients with triple negative tumors, advanced stage (pT2 or greater with nodal involvement), were more likely to relapse. The more affected area were the chest wall or breast.

COMPARISSION BETWEEN BOOST WITH VMAT AND TARGIT FOR BREAST CANCER

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Purpose: To compare the VMAT and TARGIT boost treatment volumes.

Methods: Targeted Intraoperative Radiotherapy (TARGIT) was performed, between January 2014 and 2015, using the Intrabeam™. A single dose of 20 Gy was given at the surface of the applicator (equivalent to 6 Gy at 1 cm) directly to the tumour bed with a spherical applicator of different diameters depending on the size of the lumpectomy cavity. Despite the steep gradient in physical dose, an effective uniform biological dose is distributed inside a rim of 10 mm around. Nineteen patients underwent TARGIT and supplemental Whole Breast irradiation. We compared the boost treatment volumes for EBRT and TARGIT.Primary outcome was the absolute and relative difference between both volumes. For EBRT we delineated the PTV1 and the PTV11 (boost) encompassing the surgical bed and margins. For counturing we used as reference, the planning CT image and the surgical clips. Planning with VMAT was done and the volume encompassing the 95% isodose (V95%) was considered as treatment volume. For the TARGIT, a rim of 1 cm around the applicator, encompassing the biological effective dose was considered as treatment volume (V1 cm).

Results: The average V95% in VMAT boost was 102.97 cm^3 and the median V1 cm for TARGIT, 72,47 cm^3. The median absolute difference between both volumes was 30.5 cm^3 that means a decrease in 28, 28% of treatment volume when TARGIT boost was performed.

Conclusions: TARGIT as a boost allows an optimal localization of surgical bed with a decrease of the irradiated area.

COMPUTER SUPPORT FOR PERSONALIZED MEDICINE IN BREAST FUNCTIONAL UNITS

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Objective: Having an advanced tool that allows the "integration of all information generated by the services" involved in the Breast Functional Unit: Radiology, Nuclear Medicine, General Surgery, Pathology, Medical Oncology, Radiation Therapy, Rehabilitation, Psychology and Plastic Surgery. To provide a professional support system for clinical decision during diagnosis, prognosis and treatment, allowing personalized healthcare.

Material and methods: There have been established working groups involving all specialties, analyzing its structure, protocols, records and workflows between professionals, obtaining a collection of requirements to implement the new information system. Prototypes which allow to validate the interfaces, functionality and usability of the final product, ensuring alignment with existing coding standards, sanitary procedures and information technologies are developed.

Results: A "patient oriented" platform is achieved which enhance the efficient exchange of information and knowledge among professionals, besides providing a centralized view of the disease in real time and tools to support decision making with semantic interoperability. Tool obtained based on the following elements:

- Electronic medical records; Confidentiality; Collaborative work between different services.
- Professional Assistance (ontologies for clinical decisions).
- Improving the quality of information handled and the time spent in his office presenting the most relevant information for all services quickly and intuitively.

Conclusions: The new platform will facilitate professionals of different services involved in the diagnosis and treatment of Breast Cancer, a new way of working, based on information technologies. It differs from other information systems by implementing Semantic Ontology, Health oriented environment in the areas of diagnosis, Individualized Treatment and Clinical decision support.

COVERAGE OF AXILLARY LYMPH NODE REGION WITH TANGENTIAL FIELDS IRRADIATION

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Purpose and objective: Determine the dosimetric coverage of axillary levels in patients irradiated after conservative surgery breast cancer.

Material and methods: Thirthy-three patients with early-stage breast cancer who had undergone postoperative 3-dimensional conformal radiotherapy with tangencial fields were studied. The prescribed dose was 50 Gy to the whole breast. The levels I, II and III axillary volumes were contoured using the RTOG guideliness contouring atlas. All patients underwent re-calculating using the same aproved plan. Dose-volume histograms were compared for the breast, axillary region and normal tissues.

Results: All contoured breast volumes received ≥95% of the prescribed dose. The coverage of the axillary levels lymph node region by the 95% isodose was inadequate. The median axillary level I volume was 91.4 cm (3) while the mean 95% isodose coverage of this level was 62.4% (range, 7-98%). The median axillary level II volume was 50.3 cm (3) while the mean 95% isodose coverage of this level was 49.8% (range: 3-86.5%). The median axillary level III volume was 38 cm (3) while the mean 95% isodose coverage of this level was 6.5% (range: 0-17.5%). The median of ipsilateral lung irradiated volume receiving was 14.1%.The volume of contralateral breast tissues receiving >107% of the prescribed dose was 0%.

Conclusion: The results of our study reports that no patients had received therapeutic dose to axillary level I-III lypmh node volume although the breast tissue was adequately irradiated. The lung and contralateral breast volumes irradiated were minimum.

DIFFERENTIAL DIAGNOSIS OF BROWN TUMOUR VS METASTASIS: A CASE REPORT

Núñez Losada, A.; López Loúzara, M.L.; González Castro, A.; Triñanes Perez, A.; Vázquez de la Torre González, M.L.; Rodriguez Paz, C.M.; Marcos Perez, P.; Muñoz Garzón, V.

Introduction: Brown tumour is an erosive bone injury caused by increased osteoclastic activity and peritrabecular fibrosis. These findings are an expression of primary or secondary hyperparathyroidism. Secondary hyperparathyroidism occurs in patients with advanced chronic kidney failure. From the radiological point of view, the image raises a differential diagnosis of metastasis.

Aim: Describe the process of differential diagnosis of bone lesions in a women with a history of breast carcinoma and secondary hyperparathyroidism.

Method: We present a 60-year-old women, with a personal history of chronic kidney failure. The patient developed secondary hyperparathyroidism, and had pT1bN2M0 invasive ductal carcinoma, which had been diagnosed in 2000 and treated with surgery, radiotherapy and subsequent hormone therapy. Patient consulted for lower-back pain. We performed computerised axial tomography, bone series, magnetic resonance and biopsy. With suspicion of metastases, she was referred to our service for assessment for radiotherapy.

Results: TAC revealed the presence of lytic lesions at the D11 level and the right ilium. The possibilities included metastases, myeloma, and brown tumour. Bone series revealed a lytic image in the right ilium, which suggested brown tumour, without being conclusive with the lesion at the D11 level.; RM imaging revealed a bone lesion at the D11 level, which suggested metastases. A

fine needle aspiration of the ilium and biopsy at the D11 level revealed both pathologies were compatible with brown tumour, and excluded the diagnosis of metastases.; After biopsy, radiotherapy is not indicated.

Conclusions: Differential diagnosis of lytic bone lesions includes benign etiologies. Biopsy in this case is mandatory.

DOSES TO ORGANS-AT-RISK DECREASE DRAMATICALLY WITH MULTICATHETER BREAST BRACHYTHERAPY

Guinot, J.L.; Samper, J.; Santamaría, P.; Bartrés, A.; Campo, V.; Ortí, M.; Santos, M.A.; Tortajada, M.I.; Chust, M.L.; Arribas, L.

Objectives and purposes: Low risk breast cancer in postmenopausal patients without involved lymph nodes can be treated with shorter radiation schemes with low relapse rates. We compare the dose to organs-at-risk with whole breast irradiation and exclusive high dose rate brachytherapy to assess which may be more suitable.

Material and methods: We analyzed the dose to the lung and heart in 10 patients treated with multicatheter perioperative brachytherapy (POBT) during lumpectomy for partial breast irradiation. Dose per fraction was 4 Gy b.i.d. eight fractions to deliver 32 Gy (five days). We compared with 12 patients treated with hypofractionation (HFX) 2.67 Gy five times a week, 16 fractions to achieve a total dose of 42.72 Gy (22 days). We also studied 10 control patients treated with a standard scheme of 2 Gy five times a week to 50 Gy in five weeks (WBRT).

Results: Mean dose to the lung with POBT was 1.2 Gy with a maximum dose of 14 Gy. With HFX was 6.41 and 43.7 Gy (2.73 Gy/fraction). With WBRT was 11.4 Gy and 51.79 Gy. The mean dose to lung with POBT was 5.3 times lower than HFX and 9.5 times lower than WBRT. Regarding maximum dose to the heart in left sided breasts, it reached 8 Gy with POBT, 42 Gy (2.63 Gy/fraction) with HFX and 49.75 Gy with WBRT. Therefore POBT delivers 5.25 times less dose to the heart than HFX and 6.2 times less than WBRT.

Conclusions: HFX and POBT have low relapse rates but the dose to lung and heart is dramatically reduced using POBT.

ELDERLY PATIENTS TREATED WITH ONCE-WEEKLY HYPOFRACTIONATED RADIOTHERAPY FOR BREAST CANCER

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Objectives: To evaluate local control, early and late reactions and disease-free survival of elderly breast cancer patients treated with adjuvant or definitive once-a-week hypofractionated (HF) radiotherapy (RT).

Material and methods: Between 2007 to 2012, 105 patients with a median aged 77 (35-88) years with breast cancer were treated by breast-conserving surgery or radical surgery and adjuvant Radiotherapy. The main reasons for adopting this schedule were patient very old age, locally advanced case, and/or comorbid disease. Radiation was delivered as once-a-week, 6.5 Gy for a total breast dose of 32.5 Gy in five fractions, followed with 1-2 fractions of 6.5 Gy to the tumour site.

Results: 87 patients underwent breast-conserving surgery, 14 patients radical surgery and 4 no surgery. The clinical stage distribution was as follows: I in 35, II in 45, III in 23, and IV in 2. Axillary lymph nodes were positive in 59% of cases. Early skin reactions were tolerable with no documented Radiation Therapy Oncology Group Grade 3 or higher toxicity. Late effects, mainly subcutaneous fibrosis, were recorded in 67 patients, they were classified as grade 1 in 44 cases, grade 2 in 15 cases and grade 3 in 7 patients. No toxicity in 39 patients. Local and distant failure was scored in 9 cases (8.6%). At a median follow-up of 30,55 months, 71 patients (67.6%), was alive and disease free.

Conclusions: According to the findings from this retrospective study, the HF-RT schedule is an acceptable alternative for elderly patients, allows a good local control, with acceptable toxicity.

EPPER SYNDROME AFTER BREAST CANCER RADIATION THERAPY

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Eosinophilic Polymorphic and Pruritic Eruption associated with Radiotherapy is a rare entity that appears in oncological patients after radiotherapy in the area which has been irradiated or in a different one. The aim of this article is to describe two cases of EPPER Syndrome after breast cancer radiotherapy. In this text we report two breast cancer patients treated in our centre who presented with EPPER. Two women aged 72 and 67 (mean age 69.5), with breast infiltrating ductal carcinoma, presented with EPPER Syndrome, between one day and 2 months, after radiation therapy. EPPER Syndrome can be encountered in many cancers, but more frequently in breast and cervix cancer, and it can occur up to ten months after radiotherapy treatment. EPPER develops with erythematous papules, wheals and occasionally bullae and vesicles, associated with generalized pruritus. The diagnosis is done by skin biopsy and histopathology may show a superficial and deep perivascular lymphohistiocytic infiltrate with numerous eosinophils. Our patients were treated using oral antihistamines, topical and systemic corticosteroids, and also narrowband ultraviolet B therapy if required. EPPER Syndrome is not well known due to the low frequency of presentation. Sometimes it appears long after radiotherapy, therefore it is essential to recognize its clinical signs to cover with correct treatment.

EXTERNAL-RADIATION THERAPY IN BREAST PROSTHESIS: FRACTIONATION, ACUTE TOXICITY AND TOLERANCE

Villen, J.C.; Galvan, P.; Villanueva, A.; Perez, R.; Fortes, I.; Hebrero, M.L.; Lopez, M.P.; Azcoaga, J.M.; Delgado, R.; Herruzo, I.

Aims and purposes: Breast reconstruction is a fundamental part of the treatment of breast cancer currently, in order to avoid the psychological impact that can pose a mastectomy, the trend is immediate reconstruction, why the number of patients carrying the prosthesis is increasing. Current planning and simulation programs allow us an excellent definition of the volume and tissue heterogeneity correction. We conducted this analysis to determine the acute toxicity and even more interesting, late effects in this subgroup of patients treated in our center.

Materials and methods: Retrospectively analyzed 23 women with breast cancer carriers of prostheses or breast expanders treated with external radiotherapy in the Regional Hospital in Malaga. We used two regimes of treatment both 50 Gy normofraccionated and 40 Gy hypofractionated to 2 and 2.66 Gy respectively. All patients were treated with 3D using two opposing tangential fields without IMRT planning.; To measure the results we have obtained information from three sources: the last radiological outcome, the latest clinical course and phone call.

Results: With a maximum follow-up time of 35 months, 9 patients had GII radiodermatitis, and rest ≤1. As the prosthetic

state, 7 of 23 patients had prosthetic changes, of which 5 have required replacement thereof. Of these, only one patient was treated with hipofraccioanted schedule.

Conclusions: In our experience, treatment with external-radiotherapy in patients with breast implants is safe and well tolerated. Similarly, the fractionation regimen did not influence to the breast prosthetic tolerance.

FEASIBILITY OF AN INTRAOPERATIVE RADIOTHERAPY MULTICENTER OPERATING ROOM SHARING PROGRAMME

Pinar, B.; Granados, J.; Ojeda, A.; Rodríguez-Ibarria, N.; Cabezón-Pons, M.A.; Vega, V.; Jiménez, P.; Macías-Verde, D.; Morera, A.; Lara, P.C.

Purpose: Intrabeam® device for (IORT) offers a promising approach for selected early stage breast cancer patients. The aim of the study was to assess the feasibility of a Multicenter Operating Room Sharing Programme among different academic medical centres in our province.

Materials and methods: The satellite centre adquired part of the Intrabeam equipment as the Surgical Support System and the PRS500 Control Unit. IORT is organized in the satellite centre on Fridays and consecutive Mondays. The equipment shipped includes: Electrometer, console, QA utilities, Miniature X-ray Source and Spherical Applicators. Manufacturer-provided special cases, allows for a secure transport. A specialized courier company is in-charge of the transportation. The Radiation Oncologist (RO) use to travel 30 minutes prior to the expected application.

Results: Patients were included after multidisciplinary board decision and first visit, informed consent and CT pre-planning were performed in the main centre. Delivery, quality assurance and equipment preparation at the OR succeeded without any problem. Administration of the treatment did not differ from those performed previously in the main centre. Analysis of the first four patients showed an increase in the cost of RO (60€) and transportation (75€), but there was a significant reduction in the cost of the equipment (500€). The total price of the application resulted 365€ cheaper than a standard application in the main centre (2,398.45€).

Conclusion: Intrabeam® Multicenter OR Sharing Programme supposes a feasible approach, extending an excellent treatment option to all the region population, and improving Intrabeam® resources explotation.

HIPOFRACTIONATED TREATMEN WITH SIMULTANEOUS BOOST USING VMAT IN BREAST CANCER

Serradilla Gil, A.; Álvarez Mateos, D.; Ristori Sola, A.; Chaves Barbosa, A.; Bezares Alarcón, A.; Ramos Trujillo, A.; Sacchetti, A.

Introduction: There are radiobilogical reasons justifying the use of hypofracctionation in breast cancer. Since the α/ß value of breast cancer has been estimated around 4 Gy. However, this doses may also increase the frequency and severity of side effects. IMRT has the potential to improve target coverage and reduce inhomogeneities and enables dose reduction to normal structures with reduction of treatment toxicity improving cosmesis.

Objectives: According to the results published that compared standard treatment versus hypofractionated treatments, we started a hypofractionation protocol with VMAT and SIB. The purpose is to communicate the preliminary results in 70 patients.

Materials and methods: Inclusion criteria: left breast, irregular chest wall, irradiation of supraclavicular area, voluminous breast and patient desire.

PTV and doses:

- PTV1: mamary gland/anterior chest wall. PTV2: supraclavicular area. PTV3: tumor bed.
- PTV1/PTV2: 42.56 Gy (2.66 Gy/fr). PTV3: 46.4 Gy (2.9 Gy/fr).
- OAR constraints: contralateral breast; spinal cord; lung; coronary artery/heart.
- Patient positioning verification with IGRT.

Results: Median age of the patients: 53 years (32-75). Breast-conserving surgery: 72%; Axilar lymphadenectomy in 50%.; Tumor size: T1: 50%, T2: 40%, T3: 5%, T4: 5%; positive axillary nodes: 50%. Acute skin reactions (RTOG): G0: 50%, G1: 42.5%, G2: 4.5%, G3: 0%. There were no acute adverse cosmetic results (Harvard criteria).

Conclusions: The explored approach with VMAT and SIB seems to be feasible providing consistent clinical results with excellent short-to-medium-term toxicity profile. However longer follow-up is required with a major number of patients to asses long-term outcomes.

HYPERFRACTIONATED-ACCELERATED RADIOTHERAPY FOR BREAST CANCER. THE ROLE OF TUMOUR REPOPULATION

Carmona-Vigo, R.; Rodriguez-Ibarria, N.; Cabezón, A.; Henríquez, L.A.; Pinto, W.; Pinar, B.; Lloret, M.; Lara, P.C.

Aim: To evaluate the role of high dose radiotherapy in local control of the disease by hyperfractionated-accelerated scheme in those patients resistant to neoadjuvant systemic therapy. Tumour repopulation during radiotherapy could influence clinical outcomes.

Material and methods: One hundred-eighty four patients were included in this prospective study from 1991-2011. Whole breast was treated to a dose of 60 Gy, 1.2 Gy/fraction, two fractions/day, followed by a boost of 21.6 Gy to a total dose of 81.6 Gy in seven weeks. Tumour repopulation was estimated in pretreatment biopsies by Ki67 immunostaining. Both clinical response and toxicity were evaluated during follow-up, closed in December 2013.

Results: 177 patients were evaluable for response with a mean follow-up of 132 months. The local relapse-free survival at 5, 10 and 15 years was 85.6, 82.2 and 82.2%, respectively, while the overall survival was 52.8, 34.5 and 23.3%, respectively. The radiation dose received was a determining factor for local control of the disease. Patients (37 cases) showing higher tumour repopulation (Ki67 above the median: 14%) had lower local control figures than slowly proliferating tumours (40 cases) (62% vs 84.6% at 15y; p=0,028). Severe late toxicity was modest, specially with treatment delivered by modern thecniques.

Conclusions: Hyperfractionated-accelerated radiotherapy is an effective and safe therapeutic alternative for those patients with locally advanced breast cancer unresponsive to neoadjuvant systemic therapy. Tumour repopulation estimated by Ki67 and total dose administered are the most important factors predicting local control.

HYPOFRACTIONATED RADIOTHERAPY AFTER BREAST-CONSERVING SURGERY: 3 YEARS FOLLOW-UP

Linares Galiana, I.; Tovar Martín, M.I.; Zurita Herrera, M.; Guerrero Tejada, R.; Vargas Arrabal, M.P.; Gentil Jiménez, M.A.; Expósito Hernández, J.; Prieto Prieto, C.; Rodríguez Pavón, S.; Del Moral Ávila, R.

The scheme of standard radiotherapy for breast cancer treatment involves a high total dose in 25 fractions. However, a de-

crease in the total dose, together with an increase in the dose per fraction (hypofractionation) is discussed to be at least as effective as standard treatment. To analyze the results in local control, acute and late toxicity and cosmetic outcome in patients treated with hypofractionated radiation therapy after conservative surgery for breast cancer in our center.

Material and methods: A retrospective analysis of all women diagnosed with breast cancer (Stage 0-III) and treated with breast-conserving surgery followed by hypofractionated scheme from 2006 to 2011. Total dose on mammary gland: 42.4 Gy to 2.65 Gy/fraction, for a total of 16 sessions with concomitant boost to 7.7 Gy (0.48 Gy/fraction). We included patients treated with chemotherapy, hormonal therapy and trastuzumab. Acute and late toxicities were scored according to the Common Terminology Criteria for adverse Events version 4.0 and cosmetic outcome were assessed during follow-up every three months up to 2 years and every six months up to 5 years after radiotherapy.

Results: We have treated 143 women with hypofractionated scheme. After a median follow up of 36 months, the local recurrence rate was 1.4%, only 3.5% experienced nodal relapse, one patient developed a contralateral breast cancer and 6.3% had distant metastases as first event. There was no acute toxicity in 28.4% of cases, being the most frequent grade 1 radiodermatitis (61.1%). Regarding late toxicity, this was not observed in 65.6%, being grade 1 fibrosis in the treated area the most common. The cosmetic outcome was good or excellent in 90% of patients treated. At the end of the study, 83.8% remained alive without disease, 7% alive with disease, 4.9% exitus due to tumor and 4.2% were died due to other causes.

Conclusion: The hipofractionated scheme after conservative surgery in breast cancer provides a good control of the disease without causing excessive toxicity and providing good cosmetic outcomes. Similar results to standard treatment can be obtained with a significant reduction in overall treatment time.

HYPOFRACTIONATED RADIOTHERAPY IN 60 PATIENTS WITH EARLY BREAST CANCER

Hortelano, E.; Flaquer, A.; Trueba, I.; Frias, A.; Muruzabal, I.; Poza, R.; Alía, A.

Background: The international standard radiotherapy schedule for early breast cancer delivers 50 Gy in 25 fractions of 2·0 Gy over 5 weeks, but it is increasingly common the use of hypofractionation. The aim of this study is to show that the results observed in our patients who received hypofractionated radiotherapy correspond to recent published literature in terms of local-regional tumor control and normal tissue responses.

Patients and methods: Between 2011 and 2014, data of 60 women with early breast cancer (pT1-2 pN0-1 M0) who underwent radiotherapy after primary conservative surgery were reviewed retrospectively. Median dose delivered to whole breast was 40 Gy in 15 fractions of 2.67 Gy and a median boost of 8 Gy (range 8-13.4 Gy) to surgical bed. Fourteen patients (24%) received chemotherapy and 55 patients (92%) underwent hormonotherapy.

Results: Median age of 60 women was 64 years (range 41-88 years). After a median follow-up of 26 months (range 3-50 months), the rate of local-regional and distance tumor control was 100% and 98.3% respectively. Only was described 1 pleural relapse. We observed acute toxicity grade 0-1 in 51 patients (85%), having only 9 cases (15%) of toxicity grade 2 and none of grade ≥3. Late toxicity was grade 0 in all of patients with excellent cosmetic results.

Conclusion: A radiation schedule delivering 40 in 15 fractions seems to offer rates of local-regional tumor relapse and late adverse effects at least as favourable as the standard schedule of 50 Gy in 25 fractions.

HYPOFRACTIONATED RADIOTHERAPY IN EARLY BREAST CANCER. OUTCOME AND AESTHETIC RESULTS

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Introduction: Radiobiologic models suggest that hypofractionation might be at least as just as effective as normofractionated scheme.

Objective: To evaluate toxicity, aesthetic results and outcome in 78 pacients treated with hypofractionated radiotherapy (HFRT) regimen after breast conservative surgery.

Material and methods: 78 patients treated between 2010 and 2014 by HFRT regimen have been evaluated. The scheme consisted on a total dose of 40.05-2.67 Gy/fraction to whole breast and boost to the tumor bed of 13.3/2.67 Gy/fraction. Age: mean 64 (range 42-90). Hormonal status: 16.6% premenopausal, 82% postmenopausal. Stage I: 71.7% and stage II 28%. Chemotherapy: 30.4%. Histological grade: 75% G1-2 and 24% G3. Hormone receptors: 92% positive and 8.9% negative. HER-2: 5% positive. Ki-67: 58.9% ≤15% and 41% >15%.

Results: 61.5% developed radiodermitis G1 and 39% G2. 35.8% referred pain G1 and only 1.3% G2. 11% asthenia G1. Basal cosmesis: color was excellent in 20.8%, 77.9% good and 1.3% regular. Symmetry: excellent 17.9%, good 69%, regular 11.5% and bad 1.3%. Fibrosis: excellent 20.8%, good 74%, regular 5.2%. At the end of HFRT: color excellent 2.6%, good 88.4% and regular 9%. Symmetry: excellent 16.9%, good 68.8%, regular 13% and bad 1.3%. Fibrosis: excellent 11.7%, good 77.9%, regular 10.4%. With a maximum follow-up of 48 months none local nor at distance relapse occurred and only 1 patient was exitus due to other causes.

Conclusions: HFRT provides a good control disease with no increase toxicity compared to conventional fractionation and a shortened overall treatment time.

HYPOFRACTIONATION WITH SIMULTANEOUS INTEGRATED BOOST IN EARLY BREAST CANCER

Cadavid, A.; Montero, A.; Escribano, M.C.; Martinez, M.; Capuz, A.B.; Fernandez, E.; Hernanz, R.; Polo, A.; Ramos, A.

To report clinical feasibility and tolerance of whole breast irradiation (WBI) with simultaneous integrated boost (SIB) in 15 fractions over 19 days in early breast cancer patients.

Methods and materials: Forty one eligible patients had histopathologically confirmed breast cancer operated by BCS, with median age 60 (range 36-77). Two patients had bilateral breast cancer, so they were staged as two patients but as four breasts. The whole breast received 40.05 Gy in 2.67 Gy fractions with a concomitant lumpectomy boost of 3.2 Gy in 0.53 Gy fractions. Total dose to the lumpectomy site was 48.0 Gy in 15 fractions over 19 days. Two patients received neoadjuvant chemotherapy, 32 hormonal therapy and 4 Trastuzumab. Eight patients received irradiation of lymph node areas.

Results: Between January 2012 and January 2014, 41p were treated; stage distribution was as follows: pTis: 4p (pN0: 4p), pT1b: 9p (pN0: 5p, pN1mic: 3p, pN1sn: 1p), pT1c: 26p (pN0: 14p, pN1mic: 7p, pN1sn: 4p, pN2: 1p), pT2: 2p (pN0: 1p, pN1sn: 1p), ypT1c: 1p (ypN1mic: 1p), ypT2: 1p (ypN1: 1p). The histopathology was: IDC: 34p, DCIS: 4p, ILC: 4p, IDC/Tubular: 1p. Left breast: 24p; right breast: 19p. With a median follow-up of 6 months (range, 3-29 months) all the patients are alive without evidence of tumor

relapse. CTCAEv4 grade-1 and 2 skin toxicity: 48.7% and 5%, respectively. 1P experienced G2 radiation pneumonitis due to bilateral breast irradiation.

Conclusion: Hypofractionated WBI with a SIB is feasible and was well tolerated in this series of patients and deserves further study in well-designed prospective trials.

IMAGE GUIDED HYPOFRACTIONATED RADIOTHERAPY IN POST CONSERVATIVE SURGERY BREAST CANCER

Gordo, J.C.; González, A.; Brualla, L.; Martínez, R.; Laguna, V.; Perruca, F.; Muñoz, M.; Santos, E.; Roselló, J.; López-Torrecilla, J.

Objectives: To evaluate the usefulness of image guided system to implement hypofractionated schemes in breast cancer.

Material and methods: Since January 2007 we use the technique of concomitant boost with doses of 50.4 Gy at 1.8 Gy/day to the breast and 60-64.4 Gy at 2.14-2.3 Gy/day to the tumor bed in 28 fractions. Since July 2011 we have image-guided system with structured visible light AlignRT of VisionRT for greater accuracy in the daily administration of treatment. This has allowed us to advance safely to hypofractionated treatments.

Results: In 2012, 67% of treatments were performed in 28 sessions, 2% in 20 sessions (breast 45 Gy at 2.25 Gy/day and tumor bed 56 at 2.8 Gy/day) and 31% in 15 sessions (breast 40 Gy at 2.67 Gy/day). In 2013, 22% of the treatments were performed in 28 sessions, 24% in 25 sessions (breast 50 Gy at 2 Gy/day and tumor bed 60 at 2.4 Gy/day), 31% in 20 sessions and 22% in 15 sessions. In 2014, 1.6% of treatments were performed in 28 sessions, 9% in 25 sessions, 40% in 20 sessions, 41% in 15 sessions and 8.2% through partial breast irradiation.

Conclusions: VisionRT AlignRT positioning system is a safe system for the patient and the operators, which ensures adequate daily reproduction treatment and therefore reduces the time required for the positioning and the total number of radiation sessions.

INCIDENCE AND PROGNOSIS OF BILATERAL BREAST CANCER IN OUR HOSPITAL

Jiménez Domínguez, M.; Del Castillo Acuña, R.; Peracaula Espino, F.J.

Objetives and purpose: In this paper, we present a retrospective study of the incidence and prognosis of clinically observed bilateral breast cancer in our hospital between 2006 to 2014.

Material and methods: Among 609 women with a primary breast cancer treated in our Department from 2006 to 2014, a total of 11 patients (1.8%) had bilateral breast cancer. We separated synchronous (diagnosed within 3 months after a first breast cancer) and metachronous bilateral cancer, and analyzed the tumor characteristics, the incidence and prognosis for all of them.

Results: Eight patients had synchronous bilateral breast cancer and only one case had metachronous bilateral breast cancer (developed the newly diagnosed contralateral breast tumor 8 years later the first one). The patient´s characteristics and the analysis of the 11 breast cancers are summarized. No patients were lost to follow-up.

Conclusions: Regarding complications associated with the treatment, moderate edema was observed in three patients, and one patient developed moderate fibrosis at the site of overlapping. In other cases, complications were none or slight. Anyway, the risk of normal tissue complication occurs in the context of a patient's expected longevity. Comparing the patient´s characteristics and tumor characteristics with women with unilateral disease, we found that the prognostic outlook among women with bilateral disease deteriorated over time.

INCIDENTAL IRRADIATION OF AXILLARY NODES. WHAT CAN WE EXPECT?

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Objectives: The recent publication of Z0011 study has impacted clinical practice. It concluded that lymphadenectomy could be avoided in early breast cancer with 1-2 positive sentinel nodes, without direct irradiation of axillary nodes. A reason could be that lower axilla was covered with tangential fields (TF) in breast irradiation. We try to estimate the dose received in I and II axillary levels by the incidental irradiation in adjuvant radiotherapy of the breast with (TF) in pT1pN0 breast cancer patients treated with breast-conserving surgery.

Material and methods: We analyzed dose parameters in I-II axillary levels in five patients with pT1pN0 breast cancer with breast-conserving surgery, treated in our Centre with TF, delineated according to RTOG consensus.

Results: Volume receiving 95% of prescribed dose range from 0% to 30% in axillary I level and from 0% to 2% at axillary II level. The median dose range from 6.3 to 37.9 Gy in axillary I level and from 1.1 to 32.6 Gy in axillary II level. We found also a very large variability in axillary volumes included into irradiations fields (8.8% to 77% in axillary I level and 0% to 69% in axillary II level).

Conclusions: In this sample only a minor part of axilla receives 95% of the dose prescribed to the breast with TF. The coverage of axilla varies among patients.

INSTITUTIONAL OUTCOMES IN LUMINAL-A BREAST CANCER PATIENTS TREATED CONSERVATIVELY

Ruiz, A.; Muñoz, J.L.; Ropero, F.; Quirós, J.; Ríos, Y.; Corbacho, A.; Torres, A.; González, M.A.; Cabrera, J.J.

Purpose and objectives: The purpose of this study is to assess the Disease Free Survival (DFS), Local Disease Free Survival (LDFS), Overall Survival (OS), and Cause Specific Survival (CSS) rates, as well as the identification of prognostic factors associated with these outcomes in a population of Luminal A breast cancer patients (pts) treated conservatively.

Materials and methods: retrospective analysis the 589 patients with breast cancer stage I-II Luminal-A Subtype, treated with conservative surgery plus radiation therapy from January 1995 to June 2010 in our center. Predictive variables included age, tumor stage, histological grade, margin status, radiation dose, hormonal and chemotherapy treatment. Survival estimates were determined using Kaplan-Meier methods and unadjusted and adjusted hazard ratios were calculated using the Cox regression model.

Results: Median age was 59 years. 32.5% of the pts were stage I and 46.1% stage II. 21.4% pts had histological grade III. 61.8% of the pts received adjuvant chemotherapy and 97.3% hormonal treatment. The Median radiation dose to whole breast ± boost over tumor bed was 60 Gy (50-70).; With a median follow-up of 97.68 months, the 15-years DFS, LDFS, OS and CSS were 83.6%, 95.5%, 76.2%, 88.8% respectively. On the multivariate analysis hormonal treatment (p=0.01), age (p=0.000) and tumor stage (p=0.000) were independent prognostic factors for DFS, OS and CSS.

Conclusion: early stage breast cancer Luminal-A subtype treated in a multidisciplinary way has excellent long term results.

INTRABEAM® THERAPY FOR BREAST CANCER: REAL AND COMPARATIVE COST ANALYSIS

Pinar, B.; Rodríguez-Ibarria, N.; Cabezón-Pons, M.A.; Rey-Baltar, D.; San Miguel, I.; Blanco, J.; García-Cabrera, L.; Henríquez-Hernández, L.A.; Lloret, M.; Lara, P.C.

Using an Intrabeam® device as IORT has been considered expensive due to the initial cost of the equipment. Our purpose is to elucidate the real cost of Intrabeam® in breast cancer, comparing with conventional EBRT.

Materials and methods: Between Jan-2013 and Nov-2014, 75 patients were treated with IORT during conserving surgery, delivering 20 Gy to the applicator surface. Costs were estimated by: time of operating room (OR), radiation oncologist, physicist and technician; disposable material; applicators and total equipment cost (considering 60 pts/year/10 y). For EBRT costs' calculations, institutional fares and price for distance travelled by patients daily were included. Also we calculated the daily waiting time at Radiation Oncology Department.

Results: For the 75 IORT patients, treatment time was registered by the device's software, with an average of 24.66 min (15.97-49.07 min), meaning an added OR cost of 327.46€ (212.04-651.6€). Equipment total cost was 1600€/patient. Adding staff time and disposables, procedure's average total cost has been 2,398.45€ (2283.03-2722.6€). The average 75 EBRT calculated cost was 3,980.43€/patient. Considering daily patient's trips twice 25 days, total cost increased in 105.69€ (9.5-418.95€), supposing a final cost of 4,086.12€. For patients treated with Intrabeam®, an average of 1,404.47€/patient have been saved, comparing with equivalent EBRT.; Investigating waiting time during EBRT, average daily delay was 15.9 min/patient, with a total waste of 6h 37min/patient for the whole treatment.

Conclusion: Intrabeam® treatment is cheaper than a conventional EBRT, with an average saving of 1,404.47€ per patient. It also associates a time profit that may improve QoL.

INTRAOPERATIVE RADIOTHERAPY (IOERT) WITH ELECTRONS IN BREAST CANCER.

Bouché, A.; Morillo, V.; López, J.; Boldó, E.; Lozoya, R.; Pérez De Lucía, G.; Casillas, C.; Ferrer, C.

Purpose: Evaluation of surgical complications, acute and aesthetic toxicity in patients with breast cancer and IOERT.

Material and methods: Between July 2008 and January 2015, 30 women previously diagnosed with breast cancer, have been treated with conservative surgery. Mean age 65 (45-82). Inclusion criteria: PS 0-1, age ≥45 years, histology of infiltrating single centered ductal carcinoma; tumor size ≤2.5 cm, no surgical macroscopically negative margins and study prior to surgery with mammography and magnetic resonance. IOERT was administered in 9 patients (33.3%) as a boost (9 Gy), and as exclusive (21 Gy) in 21 (66.7%), including the PTV + 2 cm margin. The applicator most used was 6 and 7 cm (35%) and energy of 9 MeV (65%). External radiotherapy consisted of 40.05-50 Gy. Acute toxicity was assessed with the RTOG scale.

Results: The follow up was 53 months. Two patients developed postoperative seroma requiring drainage. The acute toxicity was G1 in 22 (73.3%) and G2 in 8 (26.7%). The aesthetics was good or excellent in 80% and 20% acceptable.

Conclusions: The IOERT can be used as exclusive treatment or prior to external radiotherapy as an overlay. Eliminates the possible vagueness of the tumor location, allowing treatment with a limited volume of glandular tissue. By preserving the skin and subcutaneous tissue of radiation reduces the likelihood of fibrosis and telangiectasia, which improves aesthetics and toxicity. It also reduces the duration of radiation contributing to patient´s comfort and cost reduction.

INTRAOPERATIVE RADIOTHERAPY (IORT) FOR EARLY STAGE BREAST CANCER: INSTITUTIONAL EXPERIENCE (2009-2014)

Calín Lorca, Ana Isabel; Muñoz Fernández, M; Blanco Rodríguez, J.A; Guerrero Gómez, L.; Sierra Arrieta, I.M.; Alvarado Vazquez, E.; Martínez Arribas, C.M.; Lozano Barriuso, M.A.; Lizarraga, S.; Calvo Manuel, F.A.

Purpose: To assess feasibility, toxicity, and cosmetic results of intraoperative radiotherapy (IORT) with electrons delivered by standard linear accelerators or mobile lineal accelerator (LIAC) during breast conserving surgeries for early infiltrating breast cancer (BC) treatment.

Patients and methods: 49 women with early-stage BC were treated with breast-conserving therapy and IORT between February 2009 and July 2014. Depends on results of sentinel lymph nodes biopsy 28 women received a radiation single dose of 21 Gy and the remaining 21 were treated with 10 Gy boost followed by a conventional regimen of external beam radiotherapy.

Results: The median age was 65 (range 50-85), average follow up: 43 months (range 2-71). Pathologic stage were Stage I 40 cases (82%), Stage II: 9 cases (18%). Based on molecular subtypes of BC: Luminal A and B were 70% and 30% respectively. Electron energies ranged from 6 MeV to 12 MeV, 6 (75.5%). Most frequent applicator diameter used was 5 cm (82%). Beveled end of 0º, 15º, 30º were 36.7%, 34.7% and 28.6% respectively. We used metallic internal patient-shielding in all procedures. The time needed for healing of the wound was ≤15 days in 93%. Cosmetics results (NSABP/RTOG scale), were excellent: 10 (24%), good: 26 (61.9%) and fair: 6 (14.3%). We observed a liponecrosis in 10 patients (20.4%). As regards local control, there was no local relapse. 5-years OS: 93.7%.

Conclusions: In selected population (based on ESTRO/ASTRO criteria) IORT is an attractive accelerated partial breast irradiation technique, secure, repeatable with low toxicity and good cosmetic results.

ISOMORPHIC KOEBNER PHENOMENON IN BREAST CANCER

Arregui López, E.; Mendoza Chaparro, C.; Romero Aguilera, G.; Morera López, R.

Introduction: The isomorphic Koebner (IK) response is a well known phenomenon of lichen planus (LP) and develops in areas subjetec to some type of trauma. We report a case of LP confined to a radiation site.

Case report: A 61 years old woman with ductal breast cancer underwent modified radical mastectomy and left axilar node dissection followed by radiotherapy. Two months later, pink-violaceus, polyangular, pruritic papules erupted and were limited to the sites of radiation. She also presented Painless white streaks in a lacy pattern inside of the cheeks. There was no personal or family history of skin disease. Results of a 4 mm punch biopsy showed hyperkeratosis with thickening of the granular layer and a dense, bandlike lymphocytic infiltrate at the dermoepidermal interface. These findings were considered diagnostic of lichen planus. The patient's eruption responded well to topical steroids.

Discussion: The IK phenomenon appears in a variety of dermatoses, including LP. However, the appearance of LP confined to an irradiated site is extremely rare. Radiotherapy is known to have immunomodulatory properties and T lymphocytes have

been found to play a primordial role in the pathogenesis of LP. In addition to lichen planus, a wide range of dermatoses may be induced by radiation. Localized bullous pemphigoid after radiotherapy is a documented phenomenon. The majority of reported cases have occurred in women after local radiation for breast cancer. Several patients with paraneoplastic pemphigus developed their initial manifestation within a radiation field. However, often they arise within the radiation port and subsequently generalize.

LEFT-SIDED BREAST CANCER TREATMENT WITH SIB, VMAT INCLUDING SUPRACLAVICULAR

Góngora, F.; Begara, J.; Jiménez, R.; Fernandez, C.; Velasco, J.; Moreno, P.; Vallejo, A.; Guerrero, M.

Background and purposes: To show the dosimetric results for the left-sided breast cancer treatment with Simultaneous Integrated Boost (SIB), for tumor bed and breast and including the supraclavicular region, using the VMAT technique.

Material and methods: Seven patients with left sided breast cancer were treated with conservative surgery followed by radiotherapy. The dose distribution calculation was done using MONACO TPS and Monte Carlo algorithm. The CTV´s, PTV´s and PRV-OAR´s including the heart, the regions of coronary artery, the left and right lung and the contralateral breast were delineated. The prescribed dose was 46.4 Gy and D95%≥44.08 Gy to the tumor bed PTV and 42.56 Gy and D95%≥40.43 Gy to the breast and supraclavicular PTV´s. The number of fraction was sixteen: 2.9 Gy/fx to the tumor bed PTV and 2.66 Gy/fx to the breast and supraclavicular PTV´s.

Results: The results were: D95%=45.11 Gy, 41.22 Gy and 41.18 Gy for tumor bed, breast and supraclavicular PTV respectively; V5 Gy=64.37%, V10 Gy=39.82%, V20 Gy=19.36% and V30 Gy=9.46% for left lung; V10 Gy=28.24%, V20 Gy=4.93% and V30 Gy=0.06% for coronary artery; V5 Gy=52.35%, V10 Gy=16.63%, V20 Gy=1.44% and V30 Gy=0.25% for heart. The HI was 0,059 and 0.097 for tumor bed and supraclavicular PTV respectively. In order to obtain the HI breast PTV value, two different methods will be used.

Conclusion: The left-sided breast cancer can be treated using the SIB protocol and the VMAT technique obtaining simultaneously a very good dose and homogeneous distribution in the tumor bed, breast, and supraclavicular PTV, achieving the standard dose-volume restrictions.

LIDOCAINE TRANSDERMAL PATCH IN BREAST CANCER LOCAL PAIN

De Ingunza Barón, L.; Villanego Beltrán, I.; Díaz Díaz, V.; Díaz Gómez, L.; Gonzalez Calvo, E.; Salas Buzón, C.; Gutierrez Bayard, L.; Jaén Olasolo, J.

Introduction: Local pain about fibrosis and fat necrosis due local treatments is common and a contribuitor to reduce quality of life.

Materials and methods: A descriptive study was performed involving patients with early breast cancer treat with lumpectomy (± lymphadenectomy) and posterior RT 3D external beam + boost that present pain due local secundary circumscribed fibrosis and/or fat necrosis. Clinical and socio-demographic data were extracted from our Departament data base. We study age, sex, histology, RT (fractionation and total dose), radiodermitis, fibrosis, local initial pain and pain response.

Results: A total of 6 women with early breast cancer (stage I-IIA) were identified. Most were women with a mean age of 48.5 years-old. About histology, 5 were ductal infiltrative carcinoma and one was lobulillar. RT schemes were 3 patients treat with conventional fractionation (2 Gy/fraction) with a total dose 50 Gy + integrated boost and the other 3 patients treat with hipofraction (2.67 Gy/fraction) with a total dose 40.05 Gy + boost. Acute skin toxicity was grade I in all cases except one (grade II). Local fibrosis circumscribed was grade II in all the cases. Initial local pain was 4-5 (Visual Analogue Scale), decreased with transdermal lidocaine patch in 2-weeks revaluation about 0-2 (VAS) in all the patients.

Discussion: In cases of local pain in early breast cancer, treat with surgery and complementary radiotherapy, due local secundary circumscribed fibrosis and/or fat necrosis, lidocaine transdermal patch have a good control in our patients without local injury.

MARGIN STATUS AND RESULTS IN PATIENTS WITH DCIS BREAST CANCER

Corbacho Campos, A.; Muñoz Garcia, J.L.; Ropero Carmona, M.F.; Ríos Kavadoy, Y.; Quirós Rivero, J.; Torres Garcia, A.; Ruiz Herrero, A.; Gonzalez Ruiz, M.A.; Cabrera Rodriguez, J.J.

Objective: To analyze the results in term of survival in patients (pts) with ductal in situ (DCIS) breast cancer with positive (PM) or close (<2 mm) (CM) versus free margin (FM) treated with conservative surgery (CS) plus radiation therapy (RT).

Materials and methods: Retrospective comparative study of 97 pts (PM/CM: 28 pts vs FM: 69 pts) treated from January 1993 to December 2011. Baseline characteristic were similar in both groups. All pts received: 50 Gy to the whole breast ± a boost over the bed tumor of 10-20 Gy (2 Gy/fraction/day). Kaplan-Meier curves have been used for the statistical analysis of survival and the long-rank test for the comparison of the survivals. Prognostic factors such as age, tumor size, surgery, grade, hormonal and chemotherapy treatment have been related to DFS, OS, CSS and LDFS using Cox regression.

Results: The median follow-up was 115.29 (39-224) months for pts with PM/CM and 144.76 (16-252) months for FM (p=0.057). The 18-year DFS and OS for pts with PM/CM were 87.4%, and 95.5% respectively and for FM were 92.8% (p=0.683) and 85.1% (p=0.478) respectively. In the multivariant analysis only hormonal receptor was significant predictor of DFS.

Conclusions: The presence of a PM/CM (<2 mm) was not associated with worse results. Although in the presence of PM widening of this margin is recommended, RT seems to be a safe option in those pts in which enlargement is not possible.

MEASUREMENT OF THE BOLUS EFFECT DUE TO BREAST CUPS

Sabater, S.; Berenguer, R.; Arenas, M.

Introduction: Adjuvant breast irradiation of women with large or pendulous breasts is challenging. Irradiation of such patients has been associated with poor cosmetic results explained by inhomogeneous dose distribution. Breast cups are conceived to solve this problem at the expenses of a bolus effect produced by the plastic nature of its material.

Purpose: We aimed to calculate the surface dose associated with the use of breast cups.

Material and methods: Film dosimetry measurements (Gafchromic EBT2 radiocromic films) were undergone on two phantoms, a solid-water phantom and an in-house unsliced thorax phantom constructed with silicone that stuffed the breast-cup mimicking the breast. Phantoms were irradiated at 0°, 60°, 45°

and 225°. Pieces of 2×2 cm EBT2 film were placed over the phantoms. The thorax phantom was used for dose-surface comparisons given the impossibility to place the film at the maximum dose depth. A dose of 4 Gy was delivered with 6 MV over a 10×20 cm field size at SSD=100 cm. Films were scanned 24 after irradiation.

Results: The breast cups were 0.6 mm thick. Its material caused an increase in the surface dose from 28.1% to 47.7% for perpendicular incidence at gantry 0°. The surface dose values with respect to different beam incidences angles, that shows surface doses, expressed as% with respect to the maximum dose for perpendicular incidence. A CT-scan was used to measure the electronic density of the silicone which was similar to that of the fat tissue.

Conclusions: Measurements show a bolus effect that is affected by the beam angle. In the worst case scenario the surface dose is still low compared to the maximum dose obtained at 1.5 cm depth due to the high dose gradient in the build up region.

NO AXILLARY DISSECTION IN WOMEN WITH INVASIVE BREAST CANCER AND SENTINEL NODE WITH MACROMETASTASIS

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Introduction: The experience of our hospital in selective sentinel node dissection SLND (we performed SLND in our institution of 1490 patients, 20% of the cases resulted metastatic sentinel node and only 8% of this cases had involvement of other nodes in the lymphadenectomy).

Aim: The primary end point was to determine locoregional recurrence and disease free survival.

Methods: Inclusion criteria: adult women with histologically confirmed breast carcinoma T1-T2, no palpable adenopathy, negative axilla evaluated by ultrasound, and SLN positive for metastatic breast cancer documented by hematoxylin-eosin staining on permanent section. Women were ineligible if they had 3 or more positive SLNs and patients candidates to mastectomy. All women received whole-breast opposing tangential-field radiation therapy and Axillary radiotherapy included levels I and II.

Result: From February 2011 to December 2014, 91 patients met the inclusion criteria and were selected for analysis. All patients had invasive breast carcinoma and 1 or 2 sentinel node metastasis. Median follow-up was 25.25 months (5.3-48.5 months). The average tumor size was 1.90 cm (0.6 to 4.5 cm). Median excised lymph nodes was 2 and the median sentinel node with metastasis was 1. Phenotipe was: Luminal A 42.2%, luminal B her2-35.6%, luminal B her2 + 8.9% Triple negative 8.9%, Her2 + no luminal: 4.4%. At a median follow-up of 2 years disease-free survival was 93.2%.

Conclusion: In patients with limited SLN metastasis, breast cancer treatment with breast conservation, systemic therapy and radiation therapy, the use of SLND alone, avoiding the lymphadenectomy, provides good local control and survival.

NOVEL INFORMATICS TOOL FOR DECISION MAKING IN BREAST CANCER

De Haro Piedra, R.; Lopez Guerra, J.L.; Moreno Conde, A.; Parra Calderón, C.L.; Martínez García, A.; Avila, V.H.; Ortiz Gordillo, M.J.

Objective: HEDECAMA is a new informatics tool, which provides therapeutic recommendations based on international (NCCN) and national guidelines. With an intuitive, simple and fast process, this tool could help oncologists in decision making regarding the treatment of patients with breast cancer. The objective of this study was to determine the accuracy of the therapeutic recommendations provided by HEDECAMA.

Methods: Forty-one patients (mean age: 78 years old), who were diagnosed with breast cancer in 2008 were recruited to the current study. Clinical information of each patient was added to the HEDECAMA software. The therapeutic recommendations given by the software (treatment option, follow-up plan control) were compared with those given by oncologists.

Results: In 73% of the cases (N=30), the recommendations by HEDECAMA software, including treatment option, following-up, control, coincided with those recommended by oncologists. There was a 100% (n=41) agreement regarding the type of surgery, hormone-therapy, and follow-up plan. Only in10% of the cases (n=4), who received radiotherapy, HEDECAMA didn´t recommend this treatment. In 5% of the cases (n=2), who were no recommended radiotherapy by oncologists, the HEDECAMA recommended properly. In 7% of the cases (n=3) were given systemic chemotherapy and the HEDECAMA not recommended it. In 5% of the cases (n=2), received systemic chemotherapy without being indicated and the HEDECAMA was right to not recommend it.

Conclusion: The results demonstrated that HEDECAMA is an useful tool to help oncologists to decide and validate treatment for patients with breast cancer.

OUR EXPERIENCE WITH HYPOFRACTIONATED RADIATION THERAPY IN BREAST CANCER

Rios avadoy, Y.; Muñoz Garcia, J.L.; Ropero Carmona, F.; Quirós, J.; Corbacho, A.; Torres, A.; Ruiz, A.; Gonzalez, M.A.; Cabrera, J.

Objective: To evaluate the local relapse, toxicity and cosmetic outcome in patients with breast cancer treated with conservative surgery plus hypofractionated radiation therapy in our center.

Material and methods: A retrospective analysis of 98 patients with breast cancer stages I-II treated with conservative surgery plus hypofractionated radiation therapy from June 2011 to June 2013. All patients received, 40.05 Gy over the whole breast in 15 fractions (2.67 Gy/fraction) and an additional hypofractionated boost to the primary tumor bed of 13.35 Gy in 5 fractions (2.67 Gy/fraction).

Results: With a median follow up of 24 months, no patient has presented local recurrence and a patient has developed distant metastasis as the first site of failure. The 75% of the patients had initial skin toxicity grade 1 and 29% grade 2, there was no toxicity G3 or G4. The cosmetic result at 6 and 12 months of treatment was good or excellent in 96% and 100% for hyperpigmentation, 95% and 97% for symmetry and 97% and 98% for fibrosis respectively.

Conclusions: With our low and short experience, we can say that the hypofractionated radiation therapy in breast cancer after conservative surgery is well tolerated, with good cosmetic result to excellent in most patients.

OVERALL SURVIVAL, CANCER-SPECIFIC SURVIVAL, LOCAL CONTROL AND LATE TOXICITY AFTER RADIOTHERAPY IN TREATMENT IN BREAST CANCER. A SINGLE CENTER RESULTS

Najjari, D.; Eraso, A.; Martínez, E.; Gutiérrez, C.; Moreno, F.; Piñeiro, R.; Galdeano, M.; Pla, M.J.; Navarro -Pérez, V.; Guedea, F.

We report our results evaluating local control, 5 years overall survival and late toxicity in our patients.

Material and methods: Surgically-treated stage I-III breast cancer cases diagnosed in our hospital from 2009-2010 were included. A total of 290 cases of breast cancer were treated with breast conservation surgery (BCS) (84%) or mastectomy (MRM) (14.4%) followed by adjuvant radiotherapy combined or not with chemotherapy (34.4%).Median age was 60 years (35-93). Mean follow up period was 49.8 months (8-94 months). After surgery stage I, II, III, IV and in situ were 53%, 24%, 5%, 1%, 2% respectively. Nodal involvement were showed in 37.9%-pN1 26%, pN2 7% and pN3 4%. Radiotherapy modalities with external beam radiotherapy (EBRT) included normofractionated to 50 Gy in 262 patients (90.3%) and hypofractionated schema to 42.56 at 2.67 Gy/day in 26 patients (8%). Nodal radiation was given in 104 cases (35.8%). 77% of patients received Boost, 15% underwent braquitherapy.

Results: Unadjusted overall and breast cancer-specific survival mortality was assessed using Kaplan-Meier. Late skin toxicity consisted of G1 fibrosis in 88.9%, G2 in 9.3%, and G3 in 1.7%, one patient developed fat necrosis. G1-2 hyperpigmentation was found in 67.2% of patients, 1presented achromia at entrance and exitpoints of the BT needles. Other side effects included a radiation pneumonitis in 2 patients, which were successfully treated with corticosteroids, 2 cases of mastitis, and 1 case of an abscess. Cosmetic results were good to excellent in 86.4% and fair to poor in 13%.; Our results in local control was 99.7% (99%-100%), 98.2% (96%-99%) at 1 and 5 years respectively. Also overall survival (OS) was 99.7% (99%-100%) and 87.8% (80.9%-95.3%) respectively. Cancer-specific survival was 99.7% (99%-100%) and 92% (85.2%-99.3%).

Conclusions: Our experience in treatment of breast cancer with EBRT showed a good results in terms of local control, and toxicity.

PARTIAL BREAST IRRADIATION FOR BREAST CANCER PATIENTS WITH IMPLANTED PACEMAKER

Casasús Farré, M.; Nicolau Martorell, C.; Mestre Mestre, F.J.; Coca Huertas, M.

Purpose: To discuss Accelerated Partial Breast Irradiation (APBI) using 3D conformal external beam irradiation (3D-CRT) for patients with implanted pacemaker, without overdosing or relocating the pacemaker.

Methods: We report the case of a 80 year-old woman with an in situ pacemaker (Saint Jude Medical model Zephyr DR) on the right side and hypertrophic cardiomyopathy surgically treated. She was diagnosed of a right breast cancer and underwent conservative surgery. The patient was treated with 3D-CRT as performed in the NSABP B-39/RTOG 0413 protocol. Device interrogation was conducted before and after the treatment. All operating parameters of the pacemaker were found to be normal.

Results: The patient received 3D-CRT consisting of 38.5 Gy in 10 fractions. The target V100 was 100%. The PTV homogeneity was 10.8%. The V20 for the right breast was 40.5% and for the right breast without PTV was 25%. For the ipsilateral lung the V20, V10 and V5 were 0.15%, 0.6% and 7.4% respectively. For the heart, the V20 was 0%. Maximum dose delivered to the pacemaker was 4.9 Gy. Local toxicity did not exceed grade 1 and no adverse device events were noted.

Conclusion: APBI seems to be a safe option for breast cancer patients with in situ pacemaker, without the fear of interrupting pacemaker functionality.

PARTIAL BREAST IRRADIATION FOR EARLY BREAST CANCER

Del Moral, R.; Tovar, I.; Zurita, M.; Guerrero, R.; Vargas, P.; Linares, I.; Prieto, C.; Rodríguez, S.; Expósito, J.; Osorio, J.L.

Objective and purpose: To demonstrate that the partial breast irradiation (PBI) is equivalent to whole breast irradiation (WBRT) in terms of local control, survival, toxicity and aesthetic results.

Material and methods: Patients diagnosed with early stage breast cancer were randomized, after conserving surgey, to WBRT (conventional fractionation: 50 Gy, 2 Gy per fraction and simultaneous integrated boost (SIB) of 0.34 Gy/fraction or hypofractionation: 42.4 Gy, 2.65 Gy/fraction and SIB of 0.48 Gy/fraction) or PBI over the tumour bed plus margin (38.5 Gy, 3.85 Gy/fraction, 2 fraction/day).

Results: Between 2012 and 2013, 16 patients were treated. The median age was 61 years old, 10 patients were treated for left-breast cancer. There were 12 ductal infiltrating carcinomas, 3 in situ carcinomas and 1 mucinous cystadenocarcinoma. The stage was IIA or less. All cases were HER2 negative while hormone receptors were positive in 15 patients. From the total recruited patients, 7 underwent PBI. The acute toxicity was: radiodermitis grade 1 in 11 patients (6 PBI, 5 WBRT) and one patient with radiodermitis grade II (WBRT). The late toxicity consisted of radiodermitis grade II in 2 patients (PBI) and fibrosis grade I in four patients (2 PBI, 2 WBRT). There were 3 cases with mastitis (1 PBI, 2 WBRT). Any relapse was detected during the follow up and the aesthetic result was excellent in 6 patients (2 PBI, 4 WBRT), good-excellent in 6 patients (3 PBI, 3WBRT) and good in 4 patients (2 PBI, 2 WBRT).

Conclusion: PBI could be as efficient as WBRT with similar aesthetic results.

PATHOLOGICAL, MOLECULAR AND THERAPEUTIC PROGNOSTIC FACTORS IN BREAST CANCER

Delgado Arroniz, L.; Pérez Luque, S.; Lopez Guerra, J.L.; Vieites Pérez-Quintela, B.; Praena-Fernandez, J.M.; Ortiz Gordillo, M.J.

Objectives: To evaluate pathological, molecular and therapeutic prognostic factors for mortality and relapse in patients with breast cancer treated in our hospital.

Methodology: A total of 220 patients treated in 2006 with a complete follow up were reviewed.

Results: In the multivariate analysis, patients with increased tumor size and nodal status were associated with an increased risk of cancer mortality (HR: 4.24, p=0.021; and HR: 5.38, p=0.03, respectively). Patients with triple negative subtype also had a higher risk of mortality (HR: 3.39; p=0.042). Those patients with higher values of Ki67 (> median) had a higher mortality risk with a marginal statistical significance (HR: 3.11; p=0.06). In terms of disease-free survival, those who underwent mastectomy had a higher risk of relapse compared with those treated with a conservative intervention and radiotherapy (HR: 3.12, p=0.015). In addition, patients with Ki67 values> median had a higher risk of relapse (HR: 2.98, p=0.012). For locoregional recurrence, it could not be possible to perform a multivariate analysis due to the small number of events. In the univariate analysis, histological grade (HR: 2.98; p=0.014), Ki67 (HR: 4.17, p=0.001), tumor size (HR: 8.27; p<0.001), nodal status (HR: 6.55; p=0.001), stage (HR: 4.71; p<0.001) and the type of surgery (mastectomy vs conservative; HR: 4.83; p<0.001) showed statistical significance as predictors of locoregional relapse.

Conclusions: The knowledge of these therapeutic (type of surgery), pathological (tumor size, nodal status) and molecular (triple negative subtype, Ki67) risk factors help the multidisciplinary oncology team to decide the best treatment for each patient.

PATIENT-REPORTED VS. PHYSICIAN-REPORTED OUTCOMES IN BREAST CANCER: A CROSS-SECTIONAL STUDY

Carmona-Vigo, R.; Henríquez, L.A.; Lloret, M.; Cabezón, A.; Rodriguez-Ibarria, N.; Pinar, B.; Lara, P.C.

Purpose and objective: Physician-reported outcomes for toxicity are used for defining the treatment schedule. Patient-reported outcomes (PRO) should also be taken in account.

Aim: To evaluate the relationship between Patient-reported vs. Physician-reported outcomes in patients with locally advanced breast cancer treated with hyperfractionated high dose radiotherapy.

Material and methods: From 1991 to 2010, 184 patients affected by locally advanced breast cancer were included in a fase II protocol of hyperfractionated high dose radiotherapy with radical intent. In September 2011, a total of 56 patients were alive and in active follow-up. Three of them refused to participate, 2 had advanced age and another patient had Alzheimer disease. Fifty patients were evaluated for PRO by questionnaires QLQ-C30 and QLQ BR23. Physician-Reported Outcomes were assessed by RTOG scale.

Results: Older patients and those with lymph node involvement showed worse HRQOL (p=0.008; p=0.013, respectively). The scale of sexual functioning, sexual enjoyment item, the item of concern for the future and scale of local breast symptoms are the worst rated, therefore the greatest impact on patients. No relationship between subcutaneous late toxicity recorded by the Physician according to the RTOG scale and Quality of life perceived in any of the two questionnaires was found. A statistically significant inverse relationship between Cutaneous late toxicity and HRQOL was observed, so that patients with late Cutaneous toxicity G3 had better HRQOL (FS: p=0.030; SS: p=0.010).

Conclusions: No relationship was observed between Patient-reported vs. Physician-reported outcomes. Physician scored toxicity should not be the only characteristic for defining treatments schedules.

PATTERNS OF RECURRECE BY BIOLOGICAL SUBTYPE IN BREAST CANCER PATIENTS

Ruiz, A.; Muñoz, J.L.; Corbacho, A.; Ropero, F.; Quirós, J.; Ríos, Y.; Torres, A.; González, M.A.; Cabrera, J.J.

Purpose and objectives: The purpose of this study is to assess the patterns of recurrence by molecular subtype in breast cancer (BC) patients (pts) treated conservatively.

Materials and methods: Retrospective comparative analysis the 769 patients with breast cancer stage I-II, treated with conservative surgery plus radiation therapy from January 1995 to June 2010 in our center. Molecular subtype: 76.9% pts was Luminal-A, 9.2% Luminal-B, and 2.3% HER2 and 11.2% triple negative (TNBC). Survival estimates were determined using Kaplan-Meier methods and Log-Rank test for survival comparison.

Results: With a median follow-up of 97 months for Luminal-A, B and TNBC, and 79 months for HER2. 19 pts (2.4%) and 55 pts (7.1%) had local (Luminal-A: 2.7%, Luminal-B 4.2%, HER2 8.7%, TNBC 8.1%) and distant recurrence (Luminal-A: 7.3%, Luminal-B 8.5%, HER2 8.7%, TNBC 4.7%) as the first site of failure. The 10-years LDFS and MDFS were Luminal-A: 98.9% and 93.2%, Luminal-B 91.39% (p=0.045) and 91.5% (p=0.523), HER2 83.3% (p=0.000) and 86.4% (p=0.239), TNBC 96.4% (p=0.003) and 96.2 (p=0.254) respectively.

Conclusion: Based in our results, distant metastases was the first most common site of recurrence in Luminal-A and B patients and local recurrence in triple negative breast cancer patients. HER2 had similar local and distant failures.

PET-CT FOR RESTAGING OF BREAST CANCER. A CASE REPORT

Pérez Montero, H.; Murillo González, M.T.; Colmenero Hernández, M.; Casado Jiménez, M.; Cabezas Mendoza, A.M.; Moreno Hurtado, A.; Campos Bonel, A.; Pedraza Fernández, S.; Prados Losa, R.; Pérez-Regadera Gomez, J.F.

Objectives and purpose: The follow-up in patients treated of Breast Cancer is a fundamental part in its management. We present a case of a patient with a regional recurrence at supraclavicular and internal mammary level with the latter infiltrating the sternum.

Material and methods: We present a case report of a female patient aged 44 treated three years ago of triple negative breast cancer T2N0M0 by neoadjuvant chemotherapy with complete pathological response, subsequently receiving radiotherapy to breast (40 Gy) with concurrent boost (10 Gy). The patient continues periodic revisions until a supraclavicular node of 3 cm without other clinical or laboratory findings is observed. ECO-FNA is requested consistent with metastatic carcinoma. It was decided to apply PET-CT staging.

Results: In the PET a lesion in the supraclavicular level was observed and also another infiltrative lesion in the sternum, with rupture of the cortical bone and tumor involvement of the mediastinum prevascular. Because of this it was decided to start chemotherapy with Capecitabine and Bevacizumab and radiotherapy 50 Gy to both lesions, according to previously received treatment. The patient had excellent tolerance to the treatment.

Conclusion/s: The nodal recurrence is an entity to rule out in Breast Cancer follow up. Therefore it is essential to monitor abnormal findings and to know how to interpret and make a proper assessment and restaging of patients. PET-CT is a fundamental tool for the study of staging, although its indications are not quite standardized, it can be a tool to consider in the future for the restaging of these patients.

PRELIMINAR STUDY OF CARDIOPULMONAR TOXICITY WITH MAMMARY HIPOFRACCIONATED IRRADIATION TECHNIQUES

González, A.; García, P.; Gordo, J.C.; Estornell, J.; Brualla, L.; Bordería, B.; Solera, C.; Íñigo, R.; Roselló, J.; López-Torrecilla, J.

Objective: Determination of cardiac and pulmonary toxicity with hipofraccionated irradiation techniques for breast cancer.

Materials and methods: Cardiopulmonar study has been done in 15 pacients with ages between 40 and 73 years old. Each of them with indications of hipofraccionated RT after conservative surgery due to left breast carcinoma. The steps for the administrated treatment were 40 Gy in 15 sessions or 45/56 Gy in 20 sessions for boost integrated pacients. The coronary and pulmonary anatomy was evaluated using high resolution TAC and low radiation before RT and 9 months after finishing the treatment for determine the progression of coronary or pulmonar parenchyma illness.

Results: In the analysis of control TACs performed 9 months after the completion of RT, no changes were detected in the lung parenchyma attributable to treatment. Nor increase in coronary heart disease limited to the irradiated area from baseline study was detected. Only 1 of the patients had increased overall coronary disease with progression of calcification at all coronary arteries without increasing stenosis at proximal segments.

Conclusions: In the evaluation with cardiopulmonary high-resolution CT, no cardiac or pulmonary toxicity attributable to hypofractionated schemes breast irradiation is observed. A study with more patients is needed to guarantee results.

PRIMARY BREAST SARCOMA: CLINICOPATHOLOGIC SERIES FROM HUPM

De Ingunza Barón, L.; Díaz Gómez, L.; Díaz Díaz, V.; Villanego Beltrán, I.; Gonzalez Calvo, E.; Gutierrez Bayard, L.; Salas Buzón, C.; Jaén Olasolo, J.

Background and objectives: Primary breast sarcomas are rare, with an incidence. Allthough surgery represents the standard, there itsn't clearness about adjuvant treatment. We observed a high incidence in our area in the last years. In this study, we describe the clinical and pathologic datas and the follow up of the patients.

Materials and methods: Our database was searched from 2002 to 2014, including the ones with Phyllodes histology. We ensure the histology from database of Pathological Anatomy Service. The factors to analize were age, gender, type of surgery, histology, adjuvant (yes/no) and type treatment (quimiotherapy, radiotherapy…), time from last treatment and follow up.

Results: We had diagnosed 14 women cases of primary sarcoma breast, histologically 6 are malignant Phyllodes, 2 bordeline Phyllodes, 4 angiosarcoma, 1 leiomiosarcoma and 1 osteogenic sarcoma. The mean age: 45.64 years (from 13-81) and the mean of the tumor size was 6.64 cm (1.5-13). All the patients, except 1 case, underwent mastectomy allthought 4 of the 13 underwent lumpectomy with positive margins previously. They didn't have nodal metastasis at the diagnosis. None had been treated with adjuvant quimiotherapy and 12 of-all recieved an adjuvant radiotherapy with a prescribed doses between 50-60 Gy to chest wall and breast volumes. We only observed one metastatic case. A casually find in a patient with a malignant Phyllodes on the 4th year of follow up.

Conclusion: Incidence of primary breast sarcoma in our area is high from the literature incidence. The adjuvant treatment is controversial for this histological tumors.

PROGNOSTIC VALUE OF KI67 IN POSTMASTECTOMY BREAST CANCER. 14-YEARS FOLLOW-UP

Lozano Martínez, A.J.; Sánchez Paz, R.; Miller, A.; Escobar Páramo, S.; Romero Borque, A.; Porras, M.; Ortega Martín, I.; Martínez, E.; Esteban García, A.; García Fernández, R.

Purpose: To determine whether ki67 expression could predict locoregional recurrence and overall survival (OS) in postmastectomy breast cancer patients, in particular in those with 1 to 3 lymph-nodes affected.

Methods and materials: A total of 37 breast cancer patients treated in 2001 in our institution, with a radical mastectomy and a lymph-node dissection were identified. Tumors were classified by the ki67 expression, in low expression (<20%) or high expression (over 20%). We determine the disease-free survival (DFS) and OS, depending on the ki67 value.

Results: With a follow up of 14 years, mean DFS and OS were 94.5 and 96.3 months. Median OS was 96 months (70.5-121.5). A benefit in SLE was observed in the entire group with a ki67<20% compared to those with a high ki67 value. This benefit was higher in patients with 1 to 3 lymph-nodes affected and a low ki67 who experimented a longer DFS than those with a high ki67 value, with a mean DFS of 123.6 and 74.6 months respectively and a trend to be significant (p:0.061). There were no differences in OS between the ki67 value groups.

Conclusion: Patients with a ki67<20% seems to have a benefit in SLE, in particular in postmastectomy patients with 1 to 3 lymph-nodes affected who experimented a longer DFS with a trend to be significant. Further studies with a larger sample are needed to evaluate the relation between ki67 and postmastectomy 1 to 3 lymph-nodes breast cancer patients, even to evaluate if ki67 could participate in the indication of radiotherapy.

QUANTIFICATION OF THE SKIN TOXICITY IN BREAST IRRADIATION

González, A.; Brualla, L.; Gordo, J.C.; Esteve, A.; Iñigo, R.; Buedo, J.; Cantero, S.; Sánchez-Carazo, J.; Roselló, J.; López-Torrecilla, J.

Objective: To establish a measurement system that allows us to quantify the dermal toxicity produced in breast radiotherapy.

Material and methods: Systems of radiation-induced skin toxicity determination are based on subjective visual assessment scales. The radiation causes a vascular response in the skin which increases with skin alteration. This response can be measured to obtain an objective assessment of radiation-induced toxicity.; It has been used a laser Doppler flowmeter (LDF), to measure in real time the flow of skin microcirculation. Quantifications were performed in the irradiated and the contralateral breast. Before starting the RT it was performed at baseline determination. To observe changes in microcirculation irradiated area and relate to the administered dose there have been made several determinations throughout treatment and one month after completion of RT. In turn, clinical assessment of skin toxicity with usual visual assessment scales.

Results: The analysis of averaged measurements can observe a significant increase of vascularization in the area irradiated wich increases with the dose administered. However, no significant increase in vascularization is detected in non-irradiated areas. The measurements made after treatment, a decreased in microvasculature is detected, with a tendency to normalization to baseline. The increased degree of dermatitis clinical correlates with increased cutaneous vascular flow measured the last day of treatment.

Conclusions: The laser Doppler flowmeter is a good tool for objective assessment of skin toxicity and can help to decrease the morbidity of RT allowing us to establish, in advance, therapeutic measures that improve the quality of life of patients.

RADIODERMITIS IN BREAST CANCER PATIENTS. PREVENTION AND TREATMENT WITH HIALDERM

Pardo Masferrer, J.; Murcia Mejía, M.; Soto Pérez, R.; González González, J.; Montemuiño Muñiz, S.; Alastuey González, I.; Jiménez Jiménez, E.; Ortiz González, I.

Purpose: To evaluate a body emulsion, containing 0.25% hyaluronic acid, 0.25% chondroitin sulfate, Aloe Vera, carrot oil, vitamin F and vitamin E, for preventing and treating radiodermitis in breast cancer (BCP) patients undergoing radiotherapy (RT).

Material and methods: A randomized, open-label, controlled single-center study involving 90 BCP. 60 divided into two groups of 30 each (prevention group: emulsion use starting 2 weeks before radiotherapy; and treatment group: starting use upon appearance of skin problems) and compared with a historical series of 30 controls receiving no specific dermatological treatment.

Results: Mean age: 60.75 years (SD 9.6). Significant differences (p<0.0001) were observed among the 3 groups regarding development of dermal toxicity (RTOG/EORTC criteria) the control group accumulating a larger number of dermal toxicity manifestations (184 versus 103 in the treatment group and 80 in the prevention group). The time to appearance of radiodermitis after starting radiotherapy was significantly longer in the prevention group than in the control (51.72 versus 42.23 days, p=0.01). The product characteristics were very positively rated by the patients-the percentage of positive responses (quite satisfied/very satisfied) in reference to general satisfaction, rapid absorption, more hydrat-

ed and soft skin, easy application, symptoms improvement and rapidity of symptom relief being 97.05%, 97.04%, 96.75%, 96.73%, 96.45% and 94.97%, respectively. Therefore, patient satisfaction was highly positive in the majority of cases.

Conclusions: The body emulsion HIALDERM is effective in delaying the appearance of radiodermitis and in reducing the number of dermal toxicity manifestations in BCP undergoing radiotherapy.

RADIOTHERAPY AFTER BREAST AUGMENTATION OR RECONSTRUCTION IN BREAST CANCER PATIENTS

Casasús Farré, M.; Nicolau Martorell, C.; Mestre Mestre, F.J.

Purpose: To analyse the clinical and cosmetic outcome of breast cancer patients with immediate breast reconstruction or prosthetically augmented breast who had received radiation therapy (RT).

Methods: Eleven breast cancer patients with prosthetically augmented or reconstructed (autologous or prosthetic) breasts were treated with external beam RT. Five patients underwent mastectomy, five tumorectomy and one local relapse excision. Two patients had immediate autologous breast reconstruction, one underwent immediate breast reconstruction using an expander and three using prostheses, five had undergone previous breast prosthetic augmentation. Six patients received neoadjuvant chemotherapy and one of them immunotherapy. All patients received whole breast irradiation (two 40.05 Gy and nine 50 Gy) and four were boosted to a median dose of 60.8 Gy. A median dose of 48 Gy was delivered to the regional lymph nodes in two patients. Nine patients received adjuvant systemic therapy. Cosmetic results were evaluated before and after the RT (3, 6, 12 and 24 months).

Results: With a median follow-up of 21 months, all patients are alive and free of disease. Apart from mild acute skin reactions, no significant acute RT side-effects were observed. The cosmesis of the reconstructed breasts after the RT were rated as good to excellent in 63% of the patients. Two patients with fair/poor cosmetic outcomes required implant removal.

Conclusions: Patients with prosthetically augmented or immediate reconstructed breasts can undergo RT and expect good/excellent cosmetic results.

RADIOTHERAPY AFTER BREAST RECONSTRUCTION: THE EFFECT IN DOSIMETRIC COVERAGE

Jiménez Domínguez, M.; Del Castillo Acuña, R.; García Sánchez, M.J.

Objetives: The use of implants in inmediate breast reconstruction is a common option. Nowadays the cases of irradiation after inmmediate tissue expander and implant breast reconstruction is becoming increasingly. However, the practice should be evaluated in consideration of possible influence in dosimetric coverage of tumor and constraints in the organs of risks. This paper discusses the effects of radiotherapy on expander/implant breast reconstruction.

Material and methods: In this study we include a cohort of 57 women who were treated with radiotherapy and group according to the types of breast reconstruction before the radiation therapy: with silicone prosthesis (20), with tissue expander implant (17), and those who hadn´t any breast prosthesis (20). We analyze the influence of these external elements in dosimetric coverage for tumor and evaluate the lung and heart dose-volume constraints for three groups of patients.

Results: The comparison of dosimetric constraints for the risk organs, and dosimetric index are summarized. The isodoses lines for three groups of patients are represented.

Conclusions: External elements, such as silicone prosthesis and tissue expander implants, have not a significant influence in target coverage. About the normal tissue complications, we´ve found that the group of patients with tissue expander/implants reconstructions, have higher risk of developing late lung toxicity, whose treatment plans met increasing numbers of dose-volumen constraints from the set of V5<45% and V20<30%, for ipsilateral lung. Comparing the homogeneity index for three groups of patients we observe that the value of HI index is also higher for this subgroup of patients.

RADIOTHERAPY FOR BREAST CARCINOMA IN SITU: A SINGLE INSTITUTION EXPERIENCE

Moreno Yubero, A.; Oltra Ferrando, A.; Clemente Quiles, J.J.

Objective: Review of breast ductal carcinoma in situ (DCIS) referred to our institution.

Methods: Patients with breast-conserving surgery for DCIS and treated with radiotherapy in our institution are analyzed.

Results: From July 2007 to January 2015, 51 patients with DCIS were treated. Mean age was 57.4 years. Hormone receptor and Erb2 status were positive in 77% and 40% of patients respectively. Surgical margins >1 mm were achieved in 92.5% of cases. A total dose of 50 Gy was delivered to the whole breast and 16% of them received a boost at the surgical bed, either with electrons or brachytherapy. With a mean follow up of 41.6 months, 2 patients (4%) had local failure and are disease free after surgical rescue. Prognostic factors common in both cases were: high nuclear grade, under 50 years old, premenopausal status and Erb2 positive.

Conclusions: Radiotherapy following breast-conserving surgery for DCIS leads to excellent local control rates.

REIRRADIATION AND BREAST CONSERVING SURGERY IN LOCAL RECURRENT BREAST CANCER

Martinez Carrillo, M.; Martos Alcalde, M.; De Haro Bueno, C.; Capllonch Blanco, M.; Cabrero Chinchilla, A.; Reinoso Cobo, J.M.; Richarte Reina, J.M.; Garcia Madueño, J.M.

Objective: Treatment options for local recurrent breast cancer after previous irradiation in conserving surgery are limited. However a second breast conserving approach with reirradiation as part of the treatment might be feasible and safe. We report our experience of a single centre in reirradiation of local recurrent breast cancer.

Materials and methods: Between March 09 and Jaunary 2014, 6 local recurrences were reirradiated prior new conserving surgery in 6 patients. The mean dose of initial radiotherapy was 57 Gy (range, 50.4-60.6 Gy), and the mean dose of reirradiation was 50 Gy. The second course of radiotherapy was delivered using daily radiotherapy.

Results: The median follow-up from time of completion of reirradiation was 32 months (range 15-49 months). Local control was achieved in all patients. Distant control was achieved in 4 of 6 patients. At time of analysis, 5 of 6 patients were alive. Median survival since reirradiation completion was 26 months (range12-46 months). Acute toxicity included grade 2 dermatitis in 4 patients, and ipsilateral shoulder pain in 1 patient. Late skin and soft tissue toxicity manifested as fibrosis in 2 patients, hyperpigmentation in 2 patients, and telangiectasia in 1 patients. No patients reported lymphedema, 1 patient reporting chest wall pain and 1. Globally the cosmetic results are good to excellent in all patients.

Conclusions: Multidisciplinary management of local recurrence of breast cancer using reirradiation and conserving surgery is well tolerated as salvage treatment and provides durable locoregional control.

RESPIRATORY CONTROL IN RADIATION TREATMENT OF BREAST CANCER

Garcia Reglero, V.; Ripol Valentin, O.; Monfa Binefa, C.; Forner Forner, A.; Carrizo Ibarra, V.; Mira Flores, M.; Garcia Alonso, E.; Baquedano Baquedano, J.E.; Torne Gine, O.; Carceller Vidal, J.A.

Aims and purpose: The aim of this study was to evaluate the need for respiratory control in the treatment of breast in our center.

Material and methods: All consecutive patients with breast cancer undergoing radiation treatment with 3D planification at our center were included from january 2005. Treatments were delivered in Varian Linear accelerator and portal vision was required to register images portals and cine acquisition.

Results: All patients were exposed to the portal images and cine acquisition in internal tangential field at first day of treatment. No significant variation of irradiated lung was observed during the respiratory motion in the radiotherapy session. Nevertheless, we observed intrasession cardiac volume changes in patients with left breast cancer, due to heartbeat and breathing movements. Another finding was observed during the inspiratory phase, it can be seen that the heart moves away from the irradiation field and consequently volume irradiation in heart area is reduced.

Conclusions: Cardiac volume irradiated decrease if the treatment is delivered with deep inspiration breath holding, ther before we would expect to have less toxicity.

RESULT-OF FORTYSEVEN LEFT-SIDED-BREAST-CANCER PATIENTS TREATED USING SIMULTANEOUS-INTEGRATED-BOOST PROTOCOL AND VMAT

Góngora, F.; Begara, J.; Velasco, J.; Moreno, P.; Jiménez, R; Fernández, C.; Guerrero, M.; Salcedo, G.

Background and purposes: To show the dosimetric results for the left-sided breast cancer treatment with Simultaneous Integrated Boost (SIB) using the VMAT technique.

Material and methods: Forty seven patients with left sided breast cancer were treated with conservative surgery followed by radiotherapy. The dose distribution calculation was done using MONACO TPS and Monte Carlo algorithm.The CTV, PTV and PRV-OAR´s including the heart, the regions of coronary artery, the left and right lung and the contralateral breast were delineated. The prescribed dose was 46.4 Gy and D95%≥44.08 Gy to the tumor bed PTV and 42.56 Gy and D95%≥40.43 Gy to the breast PTV. The number of fraction was sixteen: 2.9 Gy/fx and 2.66 Gy/fx to the tumor bed and breast PTV´s respectively.

Results: The results were: D95%=45.11 and 41.22 Gy for tumor bed and PTV breast respectively; V5 Gy=49.78%, V10 Gy=24.43%, V20 Gy=11.01% and V30 Gy=6.38% for left lung; V10 Gy=24.21%, V20 Gy=5.77% and V30 Gy=1.54% for coronary artery; V10 Gy=15.55%, V20 Gy=3.03% and V30 Gy=1.05% for heart. The HI, defined as indicated in ICRU83, was 0,058 and 0.149 for tumor bed and breast PTV respectively. In order to obtain a real HI breast PTV value, two different methods are proposed, one based on tumor volumes and the other one based on DVH.

Conclusion: The left-sided breast cancer can be treated using the SIB protocol and the VMAT technique obtaining simultaneously a very good dose and homogeneous distribution in the tumor bed and breast, achieving the standard dose-volume restrictions.

RESULTS OF ADJUVANT ONCE-WEEKLY HYPOFRACTIONADED RADIOTHERAPY FOR BREAST CANCER IN ELDERLY PATIENTS

Beato Tortajada, I.; Frances Muñoz, A.; Morillo Macías, V.; Bouché Babiloni, A.; Conde Moreno, A.; Muelas Soria, R.; Pons Llanas, O.; Rodríguez Cordon, M.; Sanchez Iglesias, A.L.; Ferrer Albiach, C.

Purpose: To evaluate local control and early reactions of elderly breast cancer patients treated with adjuvant once-a-week hypofractionated radiotherapy (HF-RT).

Patients and methods: Between February 2014-February 2015, 9 patients with a median age 79.5 (77-82) years with breast cancer were treated by breast-conserving surgery or radical surgery and adjuvant radiotherapy. Radiation was delivered as once-a-week, 6.5 Gy for total breast dose of 32.5 Gy in five fractions, followed with 1 fraction of 6.5 Gy to the tumour site. In breast chest wall and nodal areas was delivered as once-a-week, 5.5 Gy for total dose of 27.5 Gy in these areas.

Results: There was a median follow-up of 7,5months (3-12), 5 (55%) patients underwent breast-conserving surgery (BCS), 4 (45%) patients radical surgery. The clinical stage distribution was as follows: 6 patients (67%) pT1, 2 (22%) pT2 and 1 (11%) pT3. Axillary lymph nodes were positive in 8 patients (89%). Estrogen receptors were present in 7 patients (78%), progesterone in 7 (78%) and Human epidermal growth factor receptor-2- was negative in all patients. Early skin reactions were tolerable with documented Grade 3 atrophy and edema in 1 diabetic patient with NCI-CTCAE v 4.0. No documented local failure. 1 patient with bone metastases and she was exitus. 8 patients were alive and disease free.

Conclusions: According this retrospective study, the HF-RT schedule is an acceptable alternative for elderly patients, allows a good local control with acceptable toxicity. Its necessary to analyze late toxicity and local control increased monitoring.

RISK ADAPTED INTERSTITIAL HIGH-DOSE RATE (HDR) BRACHYTHERAPY FOR BREAST CANCER

Rodríguez-Ibarria, N.; Pinar, B.; Cabezón, M.A.; San Miguel, I.; Ramirez, I.; Blanco, J.; García-Cabrera, L.; Rodríguez-Melcón, J.I.; Lloret, M.; Lara, P.C.

Purpose: Risk adapted evaluation of our results using interstitial HDR brachytherapy (HDT-BT) as a boost or as accelerated partial breast irradiation (APBI).

Material and methods: Between 1999-2014, 275 breast cancer patients have been included, with a mean follow-up of 65 months (4-179). Following GEC-ESTRO criteria, patients with low risk of recurrence were treated by exclusive HDR brachytherapy APBI (32 Gy, 8 fractions of 4 Gy). Those with intermediate or high risk were initially referred to HDR (8 Gy in tumor bed) + external-beam radiotherapy (EBRT, 50 Gy).

Results: Mean age at diagnoses was 61.67 years (24-92). According to GEC-ESTRO risk classification 41% patients were classified as low risk, 21%, as intermediate and 38% as high risk. Most of low risk cases were treated by APBI (81.7%) and most of high risk received combined treatment (64.4%). Intermediate risk patients received either APBI or combined treatment. Reasons for favouring APBI vs Combined Approach compared with initial designed treatment schedule in intermediate and high risk cases, were due to individual patients' needs (as age >70 years and distance from facility). Local disease free survival was, in the low risk group 100% at 5 and 10 years, in the intermediate risk group 96.2% and 87.4% and in the high risk group 95.6% and 92.4% at 5 and 10 years respectively.

Conclusion: Risk adapted HDR brachytherapy seems to be an adequate approach in breast cancer conservative treatment. Patient individualization (age and social situation) should be taken in account when prescribing the treatment schedule.

SAPHO SYNDROME AS A DIFFERENTIAL DIAGNOSIS OF METASTASIS

Berenguer Francés, M.A; Lafaurie Acevedo, A.M; Tormo Ferrero, V.; Cardenal Macia, R.; Martínez Andreu, F.J.

Introduction: SAPHO syndrome was proposed at the end of the eighties to group various osteoarticular manifestations with radiologic findings such as hyperostosis of the anterior wall of the thorax. This clinical picture was associated with dermatological diseases such as acne conglobata, palmoplantar pustolosis and/or psoriasis. Prevalence, etiology and pathogenesis for this syndrome remain unknown. The diagnosis is established by clinical as well as specific scan of the sternoclavicular joint.

Clinical case: A 64 years old patient diagnosed with invasive ductal carcinoma of the right breast pT1N0, who presents in the extension study of the disease through scan, a blast injury in the sternal manubrium, appears to manifest Paget's disease or metastatic injury. The study is completed by TC thoracic where a sclerosis of the sternal manubrium was believed to suggest metastasis. Physical examination reveals an enlargement of the third proximal clavicle and a selective mild pain to the palpation of the sternoclavicular joint. The patient had not manifested clinical symptoms of clinical dermatologic at any moment. The analytical results of phosphatase values, alkaline, calcium and LDH were normal. Paget's disease was ruled out.

Discussion: According to the results, it was presumed that SAPHO syndrome was the most plausible diagnosis. However, low tumor stage of the patient suggested another diagnosis. Recognizing this clinical entity might avoid mistakes when it comes to over diagnosing patients.

SECOND PRIMARY TUMOR IN THE CONTRALATERAL BREAST

Sanmamed Salgado, N.; Rubí Olea, L.; Herrera Román, M.; Sánchez Belda, M.; Alonso Martínez, P.; Diezhandino García, P.; Del Valle Rivero, M.L.; Garavís Vicente, M.I; Del Castillo Belmonte, A.; López-Lara Martín, F.

Objective: Epidemiological description of patients with contralateral breast cancer after treatment of primary breast neoplasia. Comparison of primary tumor characteristics, treatment given as well as free time of disease and overall survival.

Material and methods: Retrospective descriptive study of 32 patients treated for breast cancer from 1979 to 2010 diagnosed of contralateral tumor during the follow-up. We analyzed patient variables and relating to the tumor (histology, grade, hormonal receptor status, HER2 and Ki67), the surgical approach and the adyuvant treatment.

Results: The median age of onset of primary tumor is 47.5 years, 6 of them with a family history of breast cancer. 67.2% received radical surgery with axillary lymphadenectomy and following adjuvant treatment (19 chemotherapy, 16 hormonal therapy and 27 radiotherapy). The predominant histology was infiltrating ductal carcinoma in early stages. The median onset of contralateral breast cancer was 127 months, being previously diagnosed of local relapse 4 patients. 51.2% of the histology was an infiltrating ductal carcinoma in early stages. Overall survival of the sample is 100% found in only 2 patients distant metastases.

Conclusions: Patients diagnosed with breast cancer are at risk of contralateral disease between 3 and 10% at 10 years. In our sample, according to the data available at present, we are referring to young patients, diagnosed at early stage with 50% of cases with positive hormone receptors. Further studies are needed to classify patients at high risk of contralateral tumors with an aim of closer monitoring and/or an early treatment.

SELECTIVE SENTINEL NODE BIOPSY IN INTRAOPERATIVE RADIATION THERAPY OF BREAST CANCER

Bouché, A.; Sánchez, A.L.; Casillas, C.; Lozoya, R.; Boldó, E.; Pérez De Lucía, G.; Ferrer, C.

Purpose: Selection of patients with breast cancer for single dose IORT after performing intraoperative selective sentinel node biopsy (SSNB).

Material and method: Between July 2008 and January 2015, 35 patients were selected for conservative surgery + SSNB + IORT. Mean age 64 years old (range: 45-82). Inclusion criteria: PS 0-1, age ≥45 years, histology of infiltrating ductal carcinoma; tumor size ≤2.5 cm, negative axilla (clinical and ultrasound), no macroscopically negative surgical margins and study prior to surgery with mammography and MRI. The SSNB result was reported during surgery, according to OSNA system. Positivity involved a formal axillary lymphadenectomy and change in the decision indication for single dose IORT and adjuvant therapies.

Results: Single dose IORT didn't perform in 5 patients due to positive SSNB (2 with micrometastases and 3 macrometastases). Axillary lymphadenectomy didn't show lymph node infiltration in 4 of 5 patients. One patient with macrometastases showed 2 positive axillary ganglia from 15. Adjuvant chemotherapy was administered in this patient. IORT was delivered as boost in patients with micrometastases (dose: 9 Gy), complemented with accelerated hypofractionated external radiation therapy (dose: 40.05 Gy; 267 cGy/day).

Conclusion: SSNB is a multidisciplinary diagnostic technique involving medical and surgical specialties. Positivity implies a change in the decision and dose of IORT in breast cancer and adjuvant therapies.

SMALL-CELL CANCER OF THE BREAST: A CASE REPORT

Campos Bonel, A.; Guardado Gonzales, S.; Murillo Gonzalez, M.T; Martin Sanchez, M.; Gascón Costoso, N.; Cabezas Mendoza, A.M.; Chavez Jiménez, T.C.; Casado Jiménez, M.; Ruiz Alonso, A.; Pérez-Regadera Gómez, J.F.

Introduction: Primary small cell carcinoma of the breast is one of the least common types of breast cancer and has been infrequently documented in the medical literature.

Methods: We report a case of a 57-year-old woman without previous relevant pathology. She had pain in her right breast and physical examination revealed an asymmetric breast with erythema and edema on the right side. Mobile lymphadenopathy was present in the right axilla. A mammogram and ultrasound study of the right breast revealed dense tissue in the entire breast with marked architectural distortion. The patient underwent a core needle biopsy of the tumor, been diagnosed as neuroendocrine small cell cancer. Inmunohistochemistry was negative for estrogen and progesterone receptor and HER2. Magnetic resonance imaging and PET-CT showed a 12.5×7.5×12 cm right breast mass, lymph nodes in the right axilla and an axillary conglomerate extending toward right parasternal region and invading prevascular space of the anterior mediastinal cavity.

Results: Neoadyuvant chemotherapy (Cisplatin-Etoposido) was administered with partial response. After seven cylces the tumor size had decreased and radiation therapy (IMRT) was added. The total dosis was 50 Gy to the right breast, axilla and supraclavicular lymph nodes and internal mammary. After 4

months with disease-free survival, she had local recurrence. Actually, a new chemotherapy combination is being administered.

Conclusion: The prognosis of primary small cell carcinoma of the breast depends on the initial stage of the disease. Multimodality and tailored treatment including surgery, radiotherapy and chemotherapy seems to be the most appropriate strategy.

TARGETED INTRAOPERATIVE RADIOTHERAPY FOR BREAST CANCER

Garcia Zamora, I.; Algara, M.; Prats, M.; Tello, J.I.; Ulla Miravet, M.; Alvarez Vinuesa, M.; Lejarcegui, J.A.; Rocchi, A.; Gutierrez, D.; Guix, B.

Purpose: To evaluate our experience with single dose Targeted Intraoperative Radiotherapy (TARGIT) for breast cancer as a boost or as APBI technique in selected cases.

Methods: TARGIT was performed, between January 2014 and 2015, immediately after Breast Conserving Surgery, using X-ray system Intrabeam™, 33 patients between 39 and 95 year old with breast cancer were included, 20 Gy were applicated to the surgical bed in an average time of 23 minutes (range 16 to 45 minutes) with spherical applicators between 25 and 50 mm.

Results: The clinical stages included were: cT1a-cT1b Breast Cancer (24.24%); cT1c (39.39%); cT2 (27.27%); cT3 (3.03%) and cTis (6.06%). Pathological findings: Invasive ductal carcinoma, 20 patients (60.60%); lobular, 5 patients (15.15%); metaplasic, 1 patient (3.03%; DCIS, 1 patient (3.03%) and no residual tumor, after neoadyuvant QMT, 6 patients (18.18%); 5 patients had node involment (pN1a) (15.15%). IHC findings: Luminal A, 11 patients (33.33%); Luminal B Her2Neu negative, 14 patients (42,42%); Luminal B Her2 Neu positive, 2 patient (6,06%); HER2 NEU, 2 patients (6.06%) and Triple negative, 4 patients (12.12%). Eleven patients (33.33%), underwent TARGIT alone; 16 (48.48%) received supplemental whole breast irradiation (WBI); 3 with node involment received WBI plus axilo-SC areas, one patient underwent WBI in other institution and the remaining two are receiving chemotherapy.

Conclusions: IORT with Intrabeam™ is an easy procedure that allows an optimal localization of surgical bed with minimum increase in surgical time. APBI with TARGIT is feasible in selected patients however a long term follow up is needed.

THE ROLE AND CURRENT STATUS OF RADIOTHERAPY AFTER NEOADJUVANT SYSTEMIC THERAPY IN PRIMARY BREAST CANCER: A SURVEY-BASED EXPERT CONSENSUS STATEMENT

Arenas, M.; Montero, A.; Peñas, M.D.; Algara, M.

Background and purpose: Neoadjuvant systemic therapy (NST) is changing the role of radiotherapy (RT) in breast cancer (BC). The present study provides consensus-based recommendations to clarify the role of RT.

Material and methods: A total of 82 Radiation Oncologists from 55 participating RT centres in Spain were asked to complete an online survey about the use of locoregional RT following NST and surgery. The response rate was 76.6% (63/82). The findings were tabulated and assessed by an expert panel of radiation oncologists.

Results: Nearly all (98%) respondents agreed that the whole breast should be irradiated after breast-conserving surgery (BCS), regardless of the pathologic response to NST, in all cases. In T1-T2 and T3-T4 tumours, respectively, with sentinel node biopsy (SNB) prior to NST, 91% and 56% of respondents recommend irradiating the supraclavicular and axillary level III nodes if pre- or post-NST nodal involvement is detected (9% and 44% of respondents, respectively, recommend irradiating these areas in all cases). In T1-T2 and T3-T4 tumours, respectively, without SNB prior to NST, 67% and 30% of specialists agreed that the aforementioned nodal regions should be irradiated if nodal involvement is detected (33% and 65% of respondents, respectively, recommend irradiating these areas in all cases). Between 58-76% of specialists agreed (depending on the combination of the various scenarios considered) that nodal levels I and II should be irradiated in cases of insufficient lymphadenectomy or when >75% of the resected nodes are involved.

Conclusion: Agreement is strong regarding the indications for local RT after NST and surgery, but less so for nodal irradiation. All patients who undergo BCS should receive RT, even with complete pathologic response. After mastectomy, RT is recommended in all node-positive stage III cases. Prospective studies will clarify indications for RT in this patient population.

THREE-DIMENSIONAL CONFORMAL SIMULTANEOUSLY INTEGRATED BOOST TECHNIQUE FOR BREAST CONSERVING RADIOTHERAPY

De Haro Bueno, C.; Martos Alcalde, M.; Martinez Carrillo, M.; Capllonch Blanco, M.; Cabrero Chinchilla, A.; Reinoso Cobo, M.; Richarte Reina, JM; Cid Galache, A.

Introduction: Traditionally, the administration of the boost in the conservative treatment of breast cancer has been performed sequentially. The 3DRT- SIB technique (three dimensional conformal simultaneously integrated boost) allows to reduce the total time of treatment.

Purpose: Assessment of the acute toxicity in patients treated with 3DRT-SIB.

Methods and material: Between May 2010 and May 2014, 195 women were treated in our Unit after being operated on for breast carcinoma with conservative surgery. 43 patients received neoadjuvant chemotherapy (22%), 80 patients received adjuvant chemotherapy (41%) prior to radiotherapy. Their ages were comprised between 28 and 84 years old (average 57 years old). Postsurgical stage: pT0 (post-QT) 8%, pT1 66%, pT2 23%, pT3 2% and pT4 1%; pN0 69%, pN1 28%, pN2 2%, pN3 1%. None of them showed distant metastases. The total dose administered to the mammary gland was 42.4 Gy or 50 Gy, delivering a simultaneous boost with photon in the lumpectomy area. 0.4 Gy per fraction in 82% and 0.6 Gy per fraction in 18% were administered, reaching a total dose ranged from 52.4 to 66 Gy. Among the total of women, 32 of them (over 65 years old) were treated with hypofractionated treatment, administering 2.65 Gy daily with concomitant boost of 0.6 Gy per fraction, reaching a dose of 54.4 Gy in 16 fractions.

Results: We valued the dermal acute toxicity according to Common Terminology Criteria for Adverse Events (CTC v3.0), observing radiodermatitis G0 9%, G1 55%, G2 31% and G3 4%. No acute toxicity was observed in G4. In patients with hypofractionated treatment, toxicity was G0 8%, G1 74%, G2 21%, detecting no acute effect equal to or greater than G3.

Conclusions: The treatment with 3DRT- SIB is safe, presenting a similar toxicity to sequential boost with electrons, and allowing a reduction of the total time of radiotherapy of 1 to 2 weeks.

TOWARDS PERSONALIZED MEDICINE IN BREAST CANCER

González, A.; Brualla, L.; Gordo, J.C.; Ferrer, J.; Fuster, C.; Garcia-Vilanova, A.; Rubio, D.; Roselló, J.; Lopez-Torrecilla, J.; Belloch, V.

Objectives: The LIFE project, with a global, multidisciplinary and integrated approach, aims to contribute to optimize the entire process involved in breast cancer from early diagnosis to treatment. The strategy seeks to tailor treatment to each patient according the tumor molecular characteristics developing per-

sonalized medicine. We present the program of the project and partial progress as they happen.

Material and methods: The work lines included in the project are: Generation and validation of diagnostic and predictive biomarkers. Development of imaging equipment for diagnosis, marking, guide surgical planning and monitoring response to treatment. Application in Surgery, Chemotherapy and Radiotherapy of the advances in diagnosis. Implementation of radiotherapy techniques that allow reductions irradiated volume, and reduce side effects. Development of new drugs and methods of manufacture of radiopharmaceuticals. To develop translational medicine on the Breast Functional Unit.

Results: The presentation of the progress made to date will be used to show the lines of work followed: Research microRNA profiling, team development of molecular imaging, characterization of markers in Magnetic Resonance Spectroscopy, implementation of new drugs, Radiotherapy IGRT, Tracking Radiotherapy optimization techniques,...

Conclusions: This work seeks to highlight the challenge that faces the implementation of the LIFE project and to contrast the multiple hypothesis maintained in its realization.

TREATMENT OF BOTH-SIDED BREAST CANCER PATIENT WITH SIB AND VMAT

Góngora, F.; Begara, J.; Moreno, P.; Velasco, J.; Fernández, C.; Jiménez, R.; Recio, F.J.; Román, Y.

Background and purposes: To show the results for both-sided breast cancer treatment with Simultaneous Integrated Boost (SIB) using the VMAT technique, treating four different volumes (two tumor beds and both breast) simultaneously.

Material and methods: One both-sided breast cancer patient was treated with conservative surgery followed by radiotherapy. The dose distribution calculation was done using MONACO TPS (MonteCarlo algorithm). The CTV´s, PTV´s and PRV´s-OAR´s including heart, the regions of coronary artery, left and right lung were delineated. The prescribed dose was 58,75 Gy and D95%≥55.81 Gy to both tumor beds PTV´s and 50 Gy and D95%≥47.5 Gy to both breasts. Number of fraction was twenty-five: 2.35 Gy/fx and 2 Gy/fx to tumor beds and both breast PTV´s respectively/simultaneously.

Results: The results were D95%=56.80 Gy and 57.24 Gy for left and right tumor beds PTV´s; D95%=48.43 Gy and 47.80 for left/right PTV breast respectively; V5 Gy=61.90% and 73.38%, V10 Gy=37% and 40.87%, V20 Gy=13.93% and 14.18%, V30 Gy=8.44% and 8.83% for left/right lung respectively, V5 Gy=65.72%. V10 Gy=1.85%, V20 Gy=0% and V30 Gy=0% for coronary artery; V5 Gy=40.86%, V10 Gy=0.81%, V20 Gy=0% and V30 Gy=0% for heart; V5 Gy=67.64%, V10 Gy=38.9%, V20 Gy=14.05% and V30 Gy=8.64% for total lung. The HI values were 0,060 and 0,046 for left/right tumor bed PTV respectively. Both breast PTV´s HI values will be obtained using the volume and DVH method.

Conclusion: The four volumes of both-sided breast cancer can be treated using the SIB protocol and the VMAT technique treating simultaneously the four PTV´s with different doses (pair to pair) obtaining very good dose distribution and achieving the standard dose-volume restrictions.

TREATMENT OF LEFT BREAST CANCER WITH PECTUS EXCAVATUM: 3D-RT VERSUS IMRT.

Marcos, S.; Sotoca, A.; Vázquez, G; Caballero, B; Antolin, E; Palazón, I; Varela, M; Sánchez, P; Gómez, L; Rodriguez, A.

Objective: To determine whether intensity modulated radiation therapy (IMRT) offers a better treatment plan compared to conventional radiotherapy for patients with pectus excavatum undergoing modified radical mastectomy.

Patient and methods: In 2013, a 40 years old woman with pectus excavatum was diagnosed of cT3N1M0, triple negative, grade 3 invasive ductal carcinoma of the left breast. She received neoadjuvant chemotherapy (Doxorrubicin + Ciclofosfamide + Paclitaxel) with complete pathological response, followed by modified radical mastectomy with inmediate reconstruction. After that, radiotherapy treatment was administered to the chest-wall and axilary lymph nodes, with a prescribe dose of 50 Gy in 25 fractions. Dose volume histograms were evaluated for the PTV and organs at risk.

Results: The coverage of the whole breast was adequate for both plans. IMRT allowed a more homogeneous dose distribution within the breast at the desired dose range. With IMRT there was less volume of ipsilateral lung receiving the radiation dose that is above the tolerance threshold of 20 Gy when compared to the conventional plan. However, there was more volume of surrounding normal tissues (heart, spinal cord, and contralateral breast and lung) receiving low radiation dose when IMRT was used.

Conclusions: IMRT is feasible in treating early breast cancer patients with pectus excavatum by decreasing the ipsilateral lung and heart volumes receiving high radiation dose when compared to the conventional method.

TREATMENT WITH LIDOCAINE PATCHES OF NEUROPATHIC PAIN IN BREAST CANCER

Lanzuela Valero, M.; Ibáñez Carreras, R.; Cuartero Conejero, E.; Sanagustin Piedrafita, P.; Molina Osorio, J.G.; Vázquez Sancho, C.; Méndez Villamón, A.; Puertas Valiño, M.M.; Ponce Ortega, J.M.; Tejedor Gutiérrez, M.

Secondary to antineoplastic treatment neuropathic pain appears in 20% of patients. They are distinguished:

— Pain syndrome post-mastectomy (also conservative surgery) that appears by intercostobrachial affectation, is burning and constrictive nature. It is located in arm, underarm, and anterior chest wall.

— Post-radiotherapy pain syndrome, is caused by damage to a group of nerves that are grouped into plexuses, changes of connective tissue and focal necrosis. Numbness, tingling, pain diffuse widespread distribution there are metamerica or neuropathic pain.

Objectives: Check the effectiveness of treatment with lidocaine patches in the control of neuropathic pain post mastectomy and post-radiotherapy. Assess the toxicity of this treatment. Methodology: of patients treated for breast cancer that are reviewed in radiation oncology, we have selected those that looked for neuropathic pain poorly controlled arm, underarm, and anterior thoracic wall during 2012-2014. Using VAS scale measuring 48 hours and a month.

Results: Total: 27 patients, 2 males and 25 females, median age: 64. 3 of them did not complete the treatment. The response to the local treatment with lidocaine patches has been very good (95% response). 75% had greater than 80% response. In one case there was no response, in RM was diagnosed relapse in brachial plexus. No toxicity occurred in none of the patients treated.

Conclusions: Treatment with lidocaine in breast cancer antineoplastic post-treatment neuropathic pain is effective in many patients and very well tolerated.

USE OF BARIUM THREAD IN PLANNING OF BREAST CANCER

Ciafre, A.; Domingo, C.; Alcalá, M.; Castilla, J.F.; Maroñas, M.; Dualde, D.; Jordà, E.

Objective: Evaluate the usefulness of radiopaque barium textile thread present in surgical gauze for planning on breast cancer.

Material and methods: To perform planning treatment of breast cancer we use external marks (lead pellets, tin wires,...) that allow us to define or include areas that we want to radiate in breast cancer. Most of these marks interfere with CT images when it comes to treatment planning by radiophysicians. 1 year ago we initiated the placement of barium threads extracted from surgical gauzes in all scars both tumorectomy and mastectomy, as well as the outer contour of the mammary gland of those obese patients, where the glandular volume is delimited by palpation.

Results: The radiopaque thread is a very malleable material visible on CT without causing interference, it´s inexpensive, and easy to acquire in the healthcare environment.

Conclusion: The thread Barium is a useful additional tool for the simulation of cancer treatments, which helps us to improve its accuracy, especially in those cases where it is difficult to locate the surgical field or target organ after the completion of planning CT.

VMAT PLANNIG WITH INTEGRATED BOOST FOR LEFT BREAST CANCER

Begara, J.; Góngora, F.; Moreno, P.; Fernández, C.; Jiménez, R.; Velasco, J.; Román, Y.; Salcedo, G.; Nuño, C.; Rios, B.

Objectives: To evaluate the benefit of IMRT with VMAT on irradiation of carcinoma of the left breast with hypofractionation and integrated boost to prevent cardiac toxicity.

Methods: Ten patients received IMRT (VMAT). 5 patients on exclusive breast and 5 differents patients including nodal areas. As organs at risk: right and left lung, heart, contralateral breast cancer and coronary arteries. We made two schedules in every patient, one with restrictions on lung and heart without consider coronary arteries and other adding restrictions in coronary arteries. Prescribed doses is V42.56 Gy>95% for breast/supra/infraclavicular area and V46.4 Gy and>95% in the surgical bed (integrated boost) in 16 fractions. Restrictions in coronary arteries: V10<25%, V20<15% and V30<5%.

Results: Significant improvements in doses to critical structures were achieved using intensity modulation. The dose in coronary heart arteries decreases if restrictions are made in coronary arteries and not only in heart. Exclusive breast irradiation: V10, V20 and V30 respectively down 79.8%, 41.4% and 18.6% to 33.7%, 7.86% and 1.8%. The average dose of coronary artery reduces of 9.62 Gy to 19.12 Gy. In breast irradiation more nodal areas get similar results. The mean heart dose decrease from 10.54 Gy to 5.4 Gy and 9.26 Gy to 6.26 Gy respectively. The dose to the lungs increases without exceeding tolerable doses.

Conclusion: VMAT reduces dose in coronary arteries and heart if we determine appropriate restrictions. In left breast, nodal irradiation, complicated anatomies and integrated boost, VMAT is an important weapon in treatment.

WEEKLY HYPOFRACTIONATED RADIOTERAPHY IN ELDERLY PATIENTS WITH BREAST CANCER

Ibañez, R.; Lanzuela, M.; Sanagustín, P.; Molina, J.G.; Vazquez, C.; Tejedor, M.

Purpose: To report the short-term results of hypofractionated radiotherapy (five fractions per week) applied to elderly patients who have been subject to breast conserving surgery of early breast cancer.

Material and methods: Study includes 18 women with stage IA-IIA breast cancer treated between 2013 and 2014. Seventeen patients underwent breast conserving surgery and one had a mastectomy. In all cases, surgical procedures were followed by a total dose of 30 Gy radiotherapy (RT), with a daily fraction of 6 Gy, 5 times a week. 1 patient received a 9 Gy boost. Not restriction for RT of breast size. The body-mass index (BMI) and acute toxicity were assessed before and after RT treatment.

Results: 17 patients with breast cancer were treated with hypofractionated RT, 1 patient left the study. Median age was 79 years, mean IMC 31.31%. Radio-dermatitis grades I and II occurred in 7 patients (41.17%), skin edema in 1 (5.88%), pain in 2 (11.76%), fatigue in 2 (11.76%), and superficial cellulitis in 1 (5.88%, who received oral antibiotic treatment).

Conclusions: Hypofractionated Radiotherapy in breast cancer has demonstrated to have similar tolerance as conventionally fractionated whole breast irradiation like shown in recent trial reports. The hypofracytionated scheme is feasible and cost effective. A long-term follow-up is required to asses late post-radiotherapy complications or cosmetic effects and potential disease specific outcomes.

LUNG AND THORAX

3D-CRT VS VMAT: DOSIMETRY COMPARISON IN LUNG CANCER

Esteban Moreno, D.; Luna Tirado, J.; Rincón Pérez, M.; Marín Arango, J.; Vásquez Rivas, W.; Ilundain Idoate, A.; Olivera Vegas, J.; Prieto Muñoz, I.; Vara Santos, J.; Perez Casas, A.

Objetives and purpose: To compare dosimetry results between 3D conformal radiotheraphy (3D-CRT) and volumetric modulated arc therapy (VMAT), with the purpose of studying if VMAT is a treatment option for patients with lung cancer and unfavorable dosimetric parameters 3D-CRT.

Material and methods: Retrospective study with 13 patients, selected by consecutive sampling with advanced lung cancer, who did not comply with protocol dosimetry parameters in 3D-CRT planning. All the patients are planned in 3D-CRT and VMAT. We compared the data of both dosimetry for healthy lung (V5, V10, V13, V20 and mean lung dose) and PTV coverage (V95, V98, index homogeneity of ICRU81 and the index conformity of Paddick). Statistical analysis has been done with the SPSS Statistic Data System.

Results: VMAT planning shows better dosimetry results and statistically significant for V20 and mean lung dose. For V5 dosimetry is better in 3D with significant value too. Regarding PTV coverage, V95, V98, indexes of conformity and homogeneity registered have been favorable to VMAT, all of them with statistical significance.

Conclusion: In our series, VMAT reached a statistical significant better PTV covertures and dosimetric lung parameters. Due to this advantage, the radiotherapy treatment could be carried out. The implication of greater V5 in the risk of pneumonitis must be still defined.

ADJUVANTED RADIOTHERAPY IN ADRENOCORTICAL CARCINOMA: REGARDING A SPECIFIC CASE

Ladera, K.; Lobo, R.; Azinovic, I.

Purpose: Adrenocortical carcinoma (ACC) is an uncommon malignancy, difficult to diagnose and fast spread, with little chance of remission after surgery and/or chemotherapy. Hence,

the need to assess the effectiveness of other therapeutic methods such as adjuvant radiotherapy.

Objetive: To evaluate the efficacy of adjuvant radiotherapy on the surgical in locoregional treatment of located ACC (pT3N0M0).

Materials and methods: A 29 years old woman with a weight loss of 7 kg in 7 months. CT scan revealed a 8,5×8×3 cm right adrenal mass, intracapsular, solid, vascularized, hypodense, heterogeneous, contacting and moving the IVC. Normal levels of Catecholamine-metabolites. Right adrenalectomy with lymphadenectomy was performed, whose histopathological findings showed Adrenocortical Carcinoma (13×13.5×9.5 cm), inhibin +, synaptophysin +, and negative for S100, keratin, EMA, chromogranin and CEA; with a proliferative index (MIIB1) of 15%, infiltrating adjacent tissues, but not affecting organs (pT3N0M0). A Radiotherapy plan with IMRT technique was made for the surgical site and nodal area, but it was impossible to respect the limits of tolerance for critical organs (liver and kidney), so the patient just received radiation to surgical bed 55.8 Gy (1.8 Gy/fraction) with gastrointestinal radiotoxicity G2. Then she started treatment with mitotane.

Results: Two years after the completion of radiotherapy, she was reassessed without evidence of local or distant recurrence. Mitotane was still continued at low dosage with rest periods for hepatotoxicity.

Conclusions: Adjuvant radiotherapy on the tumor area seems to improve treatment in patients with localized ACC.

ANALYSIS OF SURVIVAL IN PATIENTS WITH METASTASIC LUNG CANCER

Sanz Martin, M.; Arregui López, E.; Morera López, R.

Introduction: Brain metastases (BM) are common and letal complication of lung cancer (LC), wich conferred a poor prognosis.

Objectives: To assess risk and prognosis factors (PF) of patients with LC and they will made BM during his illness. In addition, we analyze the effectiveness of whole brain radiotherapy (WBRT) and factors affect survival of treated patients.

Material and methods: The records of LC patients with BM during the illness between 2011 and 2014 were reviewed. Overall survival (OS) adapted to four variables were calculated: ECOG, age, histology and staging M. Then, we analyzed survival from diagnosis of BM and the factors influencing it, including WBRT.

Results: The 362 patients analyzed, 116 had had BM. The median age was 62 years old. Regarding OS, the median was 10 months (6.64-13.35). The variables that independently influence on it, were ECOG (p=0.019) and the presence of metastasis (brain or extracraneal) at diagnosis (p=0.017). After diagnosis of BM, survival decreased significantly (median of 3 months). This time, the factors that impact it were ECOG (p=0.003) and just be BM (p=0.08). Patients treated with WBRT had higher mean survival (8.38 vs 1 month; p=0.001). Patients who most benefited from this treatment were those who had good ECOG (p=0.023) with respect to other variables (age, number of metastases and histology).

Conclusions: We confirm the influence of ECOG and the presence of metastases at diagnosis as independent PF in patients with LC. We have confirmed the benefit of WBRT in patients with good performance status.

BRAIN METASTASES IN PATIENTS WITH EGFR-MUTATED NON-SMALL-CELL LUNG CANCER

Calera Urquizu, L.; Artal Cortes; A.F.; Pajares Bernad, I.; Bueso Inglan, P.; Comin Orce, A.M.; De La Llama Celis, N.; Puertas, M.; Antón Torres, A.

Introduction: Brain metastases (BM) are common in non-small-cell lung cancer (NSCLC). We evaluated the frecuency of BM in patients with epidermal growth factor receptor (EGFR)-mutated NSCLC attended in our institution since january 2011 to January 2015.

Methods: The presence of BM, clinicopathologic data, and tumor genotypewere retrospectively compiled and analized from a cohort of 34 patients.

Results: We identified 34 EGFR-mutated patients. BM were presented in 9 patients (26.4%). All patients recieved an oral tyrosine kinase inhibitor (TKI). 8 patients (88.8%) were treated with whole-brain radiotherapy (WBRT). 1 patient died before started radiotherapy. The common EGFR mutation was exon 19 deletion (66.6%). Patients were evaluated 1-3 months after finishing WBRT. All evaluated patients achieved great response, and 3 patients achieved complete response. 6 patients (66.6%) had PS 0-1, and 3 patients had PS 2-3. Even patients who had a poor PS (ECOG 3) were treated with TKI and WBRTachieving good response.

Conclusions: BM are frecuent in EGFR-mutated NSCLC patients. These patients have better prognosis and the most of then respond to WBRT, so treatment with TKI and WBRT should be considered in all patients inclusive those with poor prognosis.

CASE REPORT: RESULTS OF TREATMENT OF PRIMARY MEDIASTINAL SEMINOMA WITH CHEMOTHERAPY AND RADIOTHERAPY

Castaño Zuleta, F.A.; Paredes Rubio, S.; Laria Font, C.; Velilla Millan, C.; Lopez Mata, M.; Bellosta Ferrer, R.

Objective: To present the therapeutic results of a case of mediastinal seminoma treated with chemotherapy and radiotherapy.

Materials and methods: Male 22 years with mediastinal seminoma of 122×121×83 mm and SUV max 10.9. The response to treatment was assessed by PEC-TAC. The initial mass usual treatment of cisplatin-etoposide, 4 cycles were given. The PEC-CT at seven weeks reported a residual mass. Was chosen as salvage treatment external radiotherapy, 45 Gy to the residual stand. The PEC-CT were performed at 7th and 17th weeks post-radiotherapy.

Results: The initial mass Chemotherapy on it resulted in a significant reduction of the size and metabolic activity, leaving a residual mass of 43×33×37 mm and SUV max 4.7. With radiotherapy on the residual mass was obtained as a result that the mass did not decrease in size (46×36×23 mm), however, if the metabolic activity decreased significantly (SUV max 3.0). The metabolic response is partial, but is interpreted as clinically it is likely that the residual mass has no longer seminomatous activity and corresponds to fibro-necrotic tissue, so it was decided to do more therapeutic interventions and wait for the control PEC-TAC of the 17th week post-radiotherapy.

Conclusions: We hypothesize that, in line with other studies, after chemotherapy; often a residual mass is left. That radiotherapy could be an appropriate alternative therapy for the management of these masses. More studies are needed to clarify which scientific value of therapeutic alternatives are available (radiotherapy, chemotherapy, surgery or expectant management) offers better rates of complete response.

CHEMO-RADIOTHERAPY WITH IMRT FOR LOCALLY ADVANCED NSCLC–INSTITUTIONAL EXPERIENCE

Fondevilla, A.; Sautvayev, A.; Dzhugashvili, M.; Platoshkin, V.; Sempere, P.; Castañeda Castro, P.; Diaz, J.M.; Azinovic, I.

Purpose: To evaluate survival and toxicity results of Intensity Modulated Radiation Therapy with Simultaneously Integrated

Boost (SIB-IMRT) for locally advanced non-small cell lung cancer (NSCLC) with 60 months follow-up.

Materials and methods: Sixty-six patients with stage IIIA (35%) and IIIB (65%) non-small cell lung cancer (NSCLC) were treated with concomitant chemo-radiotherapy during November-February 2009. Histopathology revealed squamous-cell carcinoma in 61% of cases and adenocarcinoma in 39%. Chemotherapy scheme included Carbo/Cisplatinum and Taxol. IMRT step-and-shoot technique with simultaneously integrated boost (SIB) for primary tumor and involved lymph nodes was used. All patients received the same irradiation scheme: prophylactic dose for mediastinum was 56 Gy and SIB up to 68 Gy in 34 fractions. The overall survival was computed using Kaplan-Meier method, acute and late toxicity was evaluated by RTOG criteria.

Results: Dosimetric results: The 95% of prescribed dose covered at least 95% of PTV. Heart V40: 15% (0-42); Lungs Mean dose: 15 Gy (10-19); Lungs V20: 26% (15-35). Toxicity: Acute pneumonitis G0-1 was observed in 73% (48 patients); G2-20% (13 patients); and G3-7% (5 patients). There were no treatment-related deaths during the study period. The follow up period was 60 months (median=27 months). Two and five -year overall survival was 45% and 18.4% respectively.

Conclusions: Our experience shows that SIB-IMRT for NSCLC treatment can provide good overall and disease-free survival in all the patients with an acceptable rate of toxicity.

COMBINED QUEMORADIOTERAPHY IN SQUAMOUS CELL CARCINOMA OF TRAQUEA

Campo Vargas, M.; Barrado Los Arcos, M.; Errasti Viader, M.; Visus Fernandez de Manzanos, I.; Rico Osés, M.; Martinez López, E.

Objective: Primary traqueal neoplasms are rare, with incidence of 0.2 per 100.000 persons. The most prevalent histology is squamous cell. Due to shortage of data, there isn´t evidence about optimal treatment. From retrospective data; surgical resection is the mainstay of therapy, local recurrence is a major pattern of failure, and adjuvant or exclusive radiation appears effective. We want to describe the evolution of 3 patients treated by 3D-conformal radiotherapy (66 Gy) and concurrent weekly chemotherapy (carboplatin 45 mg/m² + paclitaxel 20 mg/m²).

Methods: Case 1: 68-year-old male. In 2008, he begins with respiratory obstruction and stridor. TC chest: stricturing neoplasm of trachea that infiltrates mediastinal fat. Bronchoscopy and biopsy: squamous carcinoma. Case 2: 59-year-old male with a history of transglotic carcinoma in 2008. In 2013, he begins with respiratory obstruction, stridor, and hemoptysis. TC chest: stricturing neoplasm of trachea with mediastinal adenopathies. Bronchoscopy and biopsy: squamous carcinoma. Case 3: 67-year-old male with a history of supraglotic carcinoma in 2007. In 2011, he begins with hemoptysis, obstructive dyspnea. TC chest: stricturing neoplasm of trachea. Bronchoscopy and biopsy: squamous carcinoma.

Results: For cases 1, 2 and 3; the local control was 18, 25 and 40 months (respectively), progression-free survival was 18, 10 and 40 months (respectively), and overall survival was 39, 25 and 40 months (respectively). Cases 2 and 3 are alive and progression-free.

Conclusions: Squamous cell carcinoma of trachea has low incidence, wrong forecast and difficult control. Concurrent radiotherapy and weekly chemotherapy results in our experience a very good therapy for this type of patients.

DOSE ESCALATION WITH BED10-TIME CORRECTION IN NON-SMALL CELL LUNG CANCER

Cabrera Rodríguez, J.J.; Torres García, A.; Torres García, A.; Corbacho Campos, A.; Ruiz Herrero, A.; González Ruiz, M.A.; Quirós Rivero, J.; Ropero Carmona, F.; Ríos Kavadoy, Y.; Muñoz García, J.

Objective and purpose: When treating NSCLC our institutional protocol allows moderate dose radiotherapy (RT) escalation up to 70-74 Gy (BED10: 84-88.8 Gy) on the standard 60-66 Gy (BED10: 72-79.2 Gy) providing that organs-at-risk are keep in tolerance.

Material and method: 78 patients (p.) with NSCLC were retrospectively analyzed. All had PET-CT and treated with platinum-based chemoradiotherapy. Two groups were compared according to BED10-P: 38 p. in Standard Dose (SD) and 40 p. in Escalated Dose (ED) Data were analyzed by intention to treat basis on the prescribed dose (BED10-P). For both groups current administered dose corrected for the duration of treatment (BED10-T) was calculated.

Results: For the entire group median follow-up and overall survival (OS) were: 17.7 months (mo) (IQR: 10.3-27.9) and 19.1 mo (95% CI 13.9-24.3). Median BED10-T for entire group was 45.8 Gy (IQR 40.5-49) BED10-T in SD and ED group were 42.2 (IQR 37.4-45.2) 48.9 Gy (IQR 45.7-49.7) Analysis by groups: Median OS: SD vs. ED was: 17 mo (95% CI 13.6-20.3) vs. 22.3 mo (95% CI 9.6-35) p=0.18. Median Disease Free Survival SD vs. ED was: 8.3 (95% IC 7.2-9.3) vs 12.8 mo (95% IC 3-22.7) p=0.009. Median Thoracic Progression Free Survival (TPFS) (mo) SD vs. ED was: 8.4 (95% CI 7.2-9.5) vs. 21.8 (95% CI 13.2-30.5) p=0.003.

Conclusions: ED associated statiscally significant better DFS and TPFS and non-statiscally significant better OS, even when adjusted to overall treament time.

DOSE SACALATION ACCELERATED HYPOFRACCIONATED 3D RADIOTHERAPY FOR INOPERABLE NSCLC

Mollà, M.; Saez, J.; Ramos, M.; Giraldo, A.; Simó, M.; Giralt, J.

Introduction: The purpose of this study was to assess the toxicity and clinical outcomes of AHRT with 3D conformal radiotherapy for medical inoperable NSCLC in era when SBRT was not available or can be considered ineligible.

Material and methods: 34 patients with inoperable early stage NSCLC (28 patients) or isolated relapse (6 patients) were review between August 2008 and April 2013. Prior to enrollment, patients were required to be evaluated by an experienced thoracic surgeon to determine “operability”. All received AHRT 57 Gy in 19 fractions followed by escalated doses, in 3 Gy fractions, up to a total dose of 66 Gy. Toxicities were measured using the CTCAE V 4.0.

Results: The median follow-up was 33 months (7-74). The median age was 75 years (37- 90). The average tumor size was 31.3 mm (15-60 mm). Toxicities Grade ≥2 were not observed. Local control (LC) was 80.4% at 2-year, regionalcontrol (RC) was 78%. The overall survival (OS), disease free survival (DFS) and MFS at 2-year were 60%, 59% and 80% respectively. For T1-2N0 and tumor size less than 45 mm (n=19), rates of OS and DFS and MFS at 2-year were 71%, 75% and 94% respectively. LC and RC at 2- year were 85% and 94% respectvily.

Conclusion: AHRT using 3.0 Gy fraction to a total dose of 66 Gy is safe and resulted in good control rate for early NSCLC. AHFRT is a viable alternative for clinics and patients ineligible for SBRT.

EARLY MANAGEMENT OF AN ONCOLOGICAL EMERGENCY; SUPERIOR VENA CAVA SYNDROME

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Aims and purposes: Superior vena cava syndrome (SVCS) is the clinical expression of obstruction of venous return through the superior vena cava. It is an oncological emergency that benefits from early treatment. We present a patient diagnosed with this condition and the therapeutic management that was carried out.

Material and methods: We present a case report of a male patient aged 83 who comes to the emergency room because of hemoptysis, chest pain, cough and dyspnea. He also described headache and mild cognitive impairment. A physical examination revealed facial plethora, cyanosis, upper limbs and facial edema, and bilateral jugular venous distension Further studies revealed a hilar mass that infiltrated the superior vena cava, whose histology was a neuroendocrine anaplastic small cell carcinoma. Because of this, support pharmacologic treatment was started immediately.

Results: After this, and being a chemosensitive tumor, chemotherapy with Cisplatin-Etoposide and concurrent radiotherapy on the described mass with a 10x300 cGy fraction schedule, were decided. The patient had excellent response to this treatment after two days of its onset, obtaining a clear radiologic improvement, and the complete disappearance of the symptoms at the end of the treatment.

Conclusion: The SVCS is a condition in which, due to its aggressiveness, early institution of treatment is imperative. A significant improvement can be achieved if it's carried out this way. A failure to do so could have fatal consequences. This case illustrates the clinical expression of the disease and how a correct management led to the resolution of it.

EXPERIENCE WITH RADIOTHERAPY IN THYMOMA

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Purpose: To analyze clinical results and toxicity in 3 patients treated for thymoma with radiation therapy and review of the literature.

Material and methods: Retrospective analysis of three cases of thymoma treated with radiation therapy 3D in our department. Two patients (IIB and III Masaoka stage) received adjuvant radiotherapy after thymectomy with macroscopic residual margins (R2) to a total dose of 60 Gy. The other patient, non suitable for surgery, had synchronous non small cell lung cancer (IB) and thymoma. He was treated with radical Radiotherapy, 70 Gy to the thymoma and 66 Gy to the lung tumor.

Results: With a median follow up of 8 months, all the 3 patients achieved complete response. Acute toxicity was upper gastrointestinal G1 and G2. Surgery remains primary curative treatment for resectable thymoma. Adjuvant radiotherapy has no benefit in stage I thymoma with negative margins (R0). In stage II R0, adjuvant radiotherapy improves local control in retrospective analysis in unfavorable histologies (B2, B3, Thymic carcinoma). In all cases of stage III-IV and any stage R1-R2 adjuvant radiotherapy improves local control. Induction chemotherapy is recommended for unresectable thymoma, followed by reevaluation for surgery. If surgery is no feasible, then consider radical radiotherapy with or without chemotherapy (60-70 Gy).

Conclusions: In our experience radiation therapy for thymoma is effective and well tolerated. Several studies have demonstrated the benefit of adjuvant and radical radiation therapy in terms of local control. More studies are needed to better define the role of radiotherapy in stage II thymoma.

HIPERFRACCTIONED RADIOCHEMOTHERAPY IN SMALL CELL LUNG CANCER, A MONOINSTUTIONAL EXPERIENCE

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Purpose: To evaluate our experience in radical radiochemotherapy (RCT) twice daily in limited disease small cell lung cancer (SCLC) in term of effectiveness and toxicity.

Materials: A retrospective review was performed to determine the local recurrence and survival rates for patients with SCLC localized disease undergoing RCT according Turrisi regimen between October 2004 and August 2014. All patients were treated with 3DRT, with a median dose of 45 Gy (150 cGy twice daily), combined with chemotherapy based in cisplatinum-VP16. 73% received preventive cranial irradiation (ICP). 22% of patients underwent induction QT based in platinum-VP16. The primary objective was overall survival (OS); secondary objectives were progression free survival (PFS), local progression free survival (LPFS) and toxicity. OS was analized with Kaplan-Meier test.

Results: 44 elegible patients were recruited (82% male, median age 62, with good performance status). The clinical stage was 89% E.III and 11% E.II. At a median follow-up of 18 months, the median OS was 21 months (95%CI: 16.3-25.4) and median PFS was 12.6 months (95%CI: 10.2-15). OS at 2 and 5 years were 38.6% and 24.8% respectively. LPFS was 14 months (95%CI: 10.5 -17.6) and systemic progression free survival was 14.2 (95%CI: 10.1-18.2). During the RCT we reported anaemia (2% G3), neutropenia (7% G3, 16% G4), esophagitis (2%G3), dyspnea (2%G2), pneumonitis (7% G2). Induction QT did not improve the OS and PFS.

Conclusions: In our experience radical radiochemotherapy twice daily is a feasible treatment option for small cell lung cancer, showing long-term survival with no inferiority results compared with the published and acceptable toxicities.

HYPOFRACTIONATED RADIOTHERAPY IN LUNG CANCER: OUR EXPERIENC

Zapata Martínez, I.; García Anaya, M.J.; Otero Romero, A.; Román Jobacho, A.; Gómez-Millán Barrachina, J.; García Rios, I.; Correa Generoso, R.; Toledo Serrano, M.D.; Ordoñez Marmolejo, R.; Medina Carmona, J.A.

Purpose: Our goal is to analyse the toxicity and local control of hypofractionated radiation treatment in lung cancer.

Material and methods: The current trend in the radical treatment of lung cancer with radiotherapy is the use of hypofractionation. Recent results with the scheme 55 Gy in 20 fractions have been published comparable to the standard. In our department we have adopt that scheme for localized stages (not candidates for surgery or SBRT) or locally advanced as sequential treatment after chemotherapy with good response. 3D planning. GTV: macroscopic primary tumour and lymph nodes >1 cm or PET positive. CTV: GTV + margin of 6 mm in all directions. PTV: CTV + 10 -15 mm. Patient criteria: ECOG 0-2 (ECOG 0-1 if >75 years). Weight loss <10%. No serious comorbidities.

Results: Since March 2014, 16 patients were treated consecutively with this scheme. Median age was 77 years, ECOG 0-2, stages IB-IIIB. 6 patients were treated with exclusive radiotherapy

and 10 sequentially to chemotherapy. Only 9 presented toxicity grade 1 or 2. With a follow-up range of 1-7 months, 1 patient had complete response, 8 had partial response, 2 stable disease and 4 disease progression.

Conclusion: In our experience hypofractionated radiation therapy in lung cancer with 3D technique has an excellent tolerance, with low acute toxicity and the advantage of shortening the treatment to 4 weeks. A longer follow-up is required to have evidence of chronic toxicity and clinical outcomes.

IGRT IN LUNG CANCER. IS WEEKLY CONE BEAM CT ENOUGH?

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Objective: To determine if a weekly cone-beam CT (CBCT) is enough to evaluate the treatment quality throughout the radiation course treatment in lung cancer.

Material and methods: Thirty-six patients were treated with image-guided radiotherapy (IGRT) on an Elekta Synergy Beam Modulator linear accelerator. PTV: GTV and a margin of 0.7 cm -1 cm in all directions. Prior to each radiotherapy fraction we perform one CBCT on the first five days. The positional errors of the reference image in relation to the acquired image (given in terms of translational movements) were obtained. No rotations were permitted. The average of these translational movements (x, y, z) was calculated. This average was applied from the sixth day of treatment until the end. Weekly image guidance was registered. Deviations in the three axes in every CBCT regarding the average were analyzed (Tx, Ty, Tz).

Results: The graphics summarize the result of our analysis. In 29 patients (80.6%), mean value of deviations was: x=(0.19±0.14) cm, y=(0.21±0.14) cm, z=(0.27±0.16) cm. These values were <0.5 cm and were considered correct. In the other 7 patients (19.4%) a greater difference was obtained in either axes, so a daily CBCT was planned.

Conclusions: Our preliminary results showed that in most lung cancer patients treated with IGRT, once an average is calculated after the first five days of treatment, a weekly cone-beam CT is enough to evaluate the entire tumor inclusion and the reproducibility throughout the radiation treatment.

IMPACT OF PET-CT SIMULATION IN LUNG CANCER PATIENTS TREATMENT PLANNING

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Purpose: Analyze the impact of simulation by PET-CT versus CT on PTV and OARs in lung cancer patients (LCP).

Material and methods: 63 consecutive LCP (IIIA- IIIB) underwent PET-TC with IV contrast for staging and radiotherapy treatment planning. Our protocol is: Standard PET-TC Initial Acquisition (50-110 min post-injection of 6-10 mCi of 18-FDG; 2 min/bed; *GE ST70). If no metastases have proven, we acquire images for planning using laser positioning and the required immobilization devices. Mean total dose administered: 63 Gy in 30-33 fractions. Regarding lung, V20, Dmax, MLD, V35 homolateral lung and PTV volume, and regarding OARs, V45 Esophagus, V45 heart and V45 cord were analyzed.

Results: Age: Mean 57 years. 54 males and 9 females. 39 pts NSCLC and 21 SCLC. Metastases were detected in 21. 35 pts underwent radical treatment and were analyzed. Comparing PET-CT respect CT simulation, Lung: PTV: reduced in 27 pts (77.14%) and increased in 8 (22.85%). V20: reduced in 31 pts (88.57%) and increased in 4 (11.43%). Dmax: reduced in 24 pts (68.57%) and increased in 11 (31.42%). MLD: reduced in 31 pts (88.57%), and increased in 4 (11.43%). V35homolateral: reduced in 21 pts (60%) and increased in 4 (11.43%). OARs: V45esophageal: reduced in 29 pts (82.85%) and increased in 4 (11.43%). V45heart: reduced in 20 pts (57.14%), no increase was observed. V45cord was reduced in 4 pts (11.43%), no increase was observed.

Conclusions: PET-CT planning allows to significantly reducing PTV, resulting in lower OAR received doses, lower toxicity, and better treatment adherence and tolerance.

IMPLANTABLE CARDIOVERTER-DEFIBRILLATOR CONTROL DURING THE PULMONARY RADIOTHERAPY TREATMENT

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Aim: Determine the clinical impact of treatment with external radiotherapy (ERT) and the protocol for Implantable cardioverter-defibrillator (ICD) patient located near the irradiation field.

Material and methods: 49-year-old patient with unresectable pulmonary sarcoma in left upper lobe treated with ERT. His medical history was carrying defibrillator with therapy of resynchronization dependent on its cardiac device. Cardiology service planned the follow up during and after ERT to assess possible late failures DC.

Results: Treatment is carried out with daily Cone Beam Computed Tomography positioning and cardiac monitoring. The patient was assessed by the Pacemaker Unit without alterations in the functioning of DC while being taken. It was also found that the dose in DC did not reach 2 Gy total. The tumour received 66 Gy. In the first revision had partial response without cardiac disorders. Six months later appeared brain metastases treated with ERT following the same protocol.

Conclusions: Patients with ICD and unresectable lung tumours can be treated with ERT despite the proximity to the PTV, provided that proper monitoring is performed. The ICDs should receive the lowest possible dose with fields of low energy (<10 Mv) to avoid neutron production affecting its integrated circuits, avoiding direct fields and techniques such as IMRT and respiratory gating. ICDs are 5-10 times more sensitive than pacemakers to radiation. Irradiation in the treatment field or near it may cause malfunction, loss of memory of the device, disabling or resetting. Further studies are needed to assess long-term side effects.

LOCAL TREATMENT FOR OLIGOMETASTATIC ADVANCED LUNG CANCER: CASE REPORT

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Introduction: It has been reached an improvement in overall survival (OS) and progression-free survival in patients with advanced lung cancer in recent years, simultaneously, allowing a suitable disease control sustaining the quality of life.

Case report: We present a 62 year old male diagnosed of lung adenocarcinoma, cT2aN0M0 (E-IB), PET (cT2N2M0) E-IIIA, who received chemotherapy (CT), Platax induction scheme. In September'07 he underwent right pneumonectomy and mediastinal lymphadenectomy (R0, pT2pN1M0, II-B). In March'08 the patient

presented hilar and mediastinal nodal progression and received Vincis CT with external radiotherapy (ERT) scheme concurrently from the 2nd CT cycle, reaching 60 Gy and achieving complete response. In July'10, a nodule in left upper lobe (LUL) and a node in right supraclavicular lymph region appeared, confirmed by PET/CT and positive for adenocarcinoma with fine-needle aspiration. Thus, he received CBDCA AUC5+Pemetrexed CT scheme reaching stable disease criteria. In April'12 both lesions progression was shown. Thereupon, stereotactic body radiation (SBRT) in 5 fractions, alternate days up to 60 Gy, was administered over left pulmonary nodule, followed by RTE on right supraclavicular region (30 fractions ×200 cGy) up to 60 Gy. In March'13 CT, only post-treatment changes and fibrosis including the stable known node in LUL were described. He continues outpatient monitoring to date.

Conclusions: Local radical SBRT treatment in isolated metastases improves OS in an small selected sample of patients who have received radical intrathoracic disease treatment before, and with an adequate performance status, obtaining greater improvement of OS than the expected in advanced lung cancer.

LONG EVOLUTION IN SMALL LUNG CANCER

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Objectives and purposes: Show the benefits and contribution of radiation therapy associated with chemotherapy in SCLC.

Material and methods: We present the case of a man with the diagnosis of ES-SCLC associated with poor survival prognostic factors´ such as the age, sex, smoking status and the tumor stage (IV), with extended thoracic illness and brain since the diagnosis and progression with leptomeningeal metastases. He has reached 43 months of overall survival after taking benefit from an aggressive treatment based on surgery, chemotherapy and thoracic and cranial radiotherapy and afterwards palliative radiotherapy at different relapses.

Results: Higher survival than expected in a patient with this diagnosis associated to poor survival prognosis factors.

Conclusion: The role of radiation therapy in this patient was fundamental and probably it contributed to improve survival and life quality. Despite there is not an established well defined role, thoracic radiotherapy in ES-SCLC can contribute not only to increase time to relapse but also increase survival.

LUNG DOSIMETRIC PARAMETERS WITH VMAT IN LUNG CANCER. CLINICAL CONSECUENCES

Luna Tirado, J.; Esteban Moreno, D.; Marín Arango, J.P.; Vásquez Rivas, W.; Ilundain Idoate, A.; Rincón Pérez, M.; Prieto Muñoz, I.; Olivera Vegas, J.; Vara Santos, J.; Pérez Casas, A.M.

Objectives: To compare lung dosimetric parameters between 3D conformal radiotherapy (3D-CRT) and volumetric modulated arc therapy (VMAT) – for locally advanced lung cancer. To register the pneumonitis rate in our follow-up.

Material and methods: We included 13 patients diagnosed of lung cancer, treated with radiochemotherapy, total dose 60 Gy, usual fractionation. All patients were initially planned with 3D. A VMAT planning was made if the protocol dosimetric parameters were not achieved in 3D planning. The two planned treatments were compared and all of these patients were treated with VMAT. The VMAT planning was made with Elekta Monaco Planner with Montecarlo algorithm. The lung dosimetric parameters V5, V10, V13, V20 (lung volume receiving more than 5, 10, 13 and 20 Gy) and mean lung dose (MLD) were registered and compared between the two plannings using the SPSS Statistic Data System.

Results: V20 and MLD showed significant statistical difference favorable to VMAT. V10 and V13 presented equivalent results and V5 was greater with VMAT with statistical difference. With a median follow-up of 10 months, the pneumonitis was registered using the Common Toxicity Criteria and Adverse Events (CTCAE) v3.0. Only 1 patient (7.6%) presented pneumonitis, grade II. The remainders 11 patients (92.4%) presented pneumonitis grade 0-1.

Conclusion: Our preliminary results show a significant statistical advantage in classic lung dosimetric parameters (V20, MLD) for VMAT. The pneumonitis rates have been very low. Due to this dosimetric advantage, the concomitant radiotherapy could be carried out. A longer follow-up It´s needed to verify the good lung tolerance.

MALIGNANT PLEURAL MESOTHELIOMA TREATED WITH INTENSITY-MODULATED RADIATION THERAPY. CASE REPORT

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Purpose: Malignant pleural mesothelioma (MPM) treated with intensity-modulated radiation therapy (IMRT) after extrapleural pneumonectomy (EEP). Case report and review.

Material and methods: A 51 year old patient received 5 cycles of neo-adjuvant chemotherapy CDDP-Pemetrexed with partial response. EEP was performed with free margins. Pathological stage IB: ypT1b ypN0 M0. Adjuvant radiation therapy delivered with IMRT to a total dose of 54 Gy (2 Gy/fraction). CTV: preoperative extent of the pleural space, surgical scars and drain sites. PTV: CTV+8 mm. Daily positioning verification of the organs at risk with Cone Beam CT was performance. Two isocenters with dynamic MLC was used, 6 fields per isocenter avoiding the entrance through the contra lateral lung.

Results: Patient was assessed weekly for acute toxicity (CTCAE v3.0). He experienced asthenia G1, anorexia G1, weight loss 5%, dysphagia G1, acute pulmonary toxicity G2, needing extra nutritional support, steroids and paracetamol. CT scan one month after treatment shows no evidence of disease and the patient has recovered from acute toxicity due to radiation therapy. According to the literature optimal treatment approach is controversial. Trimodal therapy may offer a survival advantage in selected patients. IMRT can offer better coverage to the PTV, although fatal pulmonary toxicity has been reported to be high.

Conclusion: IMRT planning for MPM is challenging, but offered better coverage of PTV than conventional planning. Treatment was well tolerated by the patient. Longer follow up should be needed to better report clinical outcome.

MANAGEMENT OF THORACIC CANCER PATIENTS WITH A PACEMAKER

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Purpose: We review our experience in thoracic cancer patients bearing pacemakers who were underwent to radiotherapy. We implemented a management based in a Dutch clinical guideline.

Methods and material: We evaluated the patients having pacemakers treated with thoracic radiotherapy during three year in our department. The cumulative dose in the pacemaker and pacemaker dependency have been considered to categorise into low, medium and high risk group. Patients receiving less than 2 Gy to their pacemaker are categorized as low risk, unless the pa-

tient was pacemaker dependent then he would be considered as medium risk. Between 2 and 10 Gy, patients were categorized as medium risk, while above 10 Gy, patients were considered as high risk. The cardiologist interrogated the device to assess sensing, pacing threshold and impedance before and after of treatment.

Results: Between 2012 and 2015 five patients were treated with pacemaker localized near the thoracic tumor. One breast cancer, three lung cancers and one patient with infraclavicular and axillary metastasis were included. Dose-volume histograms showed an average cumulative dose in the pacemaker of 2.6 Gy. Three patients were considered as medium risk. This group was checked-up weekly. Low risk was reported in two patients who were checked-up at the beginning and end of treatment. In any case we detected device failure or clinical consequences.

Conclusion: Precautions are necessary to minimize the risk to patients with pacemakers during thoracic radiotherapy. Close liaison with cardiologists is essencial to establish protocols to ensure a safe treatment.

NSCLC WITH CEREBRAL OLIGOMETASTASES: RADICAL STEREOTACTIC RADIOTHERAPY. CASE REPORT AND REVIEW

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Purpose: To present a case report and review of published literature on radical treatment in NSCLC patients with brain oligometastases.

Material and methods: We report a case of a 66 years old male, smoker, with moderate comorbidity, diagnosed with NSCLC cT1b cN0 M1b, stage IV, with a single brain metastases. The patient was treated with radiosurgery for the brain lesion (24 Gy/single dose) followed by whole brain radiotherapy (30 Gy/10 fractions) and stereotactic body radiotherapy (SBRT) to the lung tumor (54 Gy/3 fractions).

Results: Our patient achieved complete response of both lesions and after two years of follow up continuous alive without disease. Retrospective data suggest that treatment with curative intent, addressed to oligometastases and primary tumour, provide increased Disease free survival (DFS) and overall survival (OS) when compared to cohorts treated with palliative intent (1 year OS 50-71% and median SLE 15.5-31.8 months) (1-4). A phase II prospective trial with NSCLC with synchronous oligometastases, found 56.4% 1 year OS and DFS 13.6 months for the subgroup of patients with brain metastases. (5) Factors associated with higher OS are Karnofsky >80 and primary tumor dose >63 Gy (3).

Conclusion: In recent years there has been growing evidence that NSCLC patients with synchronous brain oligometastases form a subgroup of stage IV patients with prognosis close to IIIA (6). Therefore, selected patients could benefit from radical treatment of both lesions.

PHASE II RANDOMIZED TRIAL OF ERLOTINIB IN COMBINATION WITH 3D RADIOTHERAPY (RT) IN PATIENTS (P) WITH LOCALLY ADVANCED OR INOPERABLE NON SMALL CELL LUNG CANCER (NSCLC). FINAL RESULTS

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Introduction: Different treatment schemes associating RT with CT or targeted therapies have been devised trying to improve the results of locally advanced or non-surgical NSCLC. Erlotinib is an inhibitor of EGFR-TK which has improved the survival of patients with metastatic NSCLC. This study, whose preliminary results were reported at the 15th SEOR Congress, is the first one evaluating the safety and efficacy of the addition of erlotinib to RT in patients diagnosed of NSCLC not candidates to surgery nor CT.

Methods: Phase II, multicenter and randomized study (design 1/2). P diagnosed of stage I-IIIB unresectable NSCLC, with ECOG<2 and measurable disease by RECIST criteria were included. P assigned to arm A received 3DcRT (66 Gy/33 fractions) and the p in arm B received identical RT and erlotinib 150 mg/day concurrent and up to a maximum of 6 months. The main objective was the grade 3-4 toxicity and secondary objectives: rate of responses, DFS, OS and Cause Specific Survival (CSS).

Results: We included 90 p (30 in arm A and 60 in arm B), 89 and 81 were valid for safety and effectiveness analysis respectively. The baseline characteristics were similar in both arms. Responses: CR A/B (%): 21.4/41 (p<0.05). With a median follow-up of 17.1 m, the OS was 15.3 m in arm A and 12.9 m in B (p NS) and the CSS 17.7 m vs. 21.4 m (p NS). Toxicities: Grade 3-4 A/B (%): Pneumonitis: 10.6/3.3; Radiodermitis: 3/3.3); Esophagitis: 0/0; Pulmonary fibrosis: 0/3.3; Heart disease: 3.4/1.6; Rash: 0/13.3; Diarrhoea: 3.4/6.7; Asthenia: 0/8,3.

Conclusions: This study demonstrates the feasibility of concurrent thoracic RT and erlotinib in NSCLC p. Noteworthy is the high rate of CR and the high CSS in the experimental arm, which was not reflected in an OS increase. Toxicity was higher with erlotinib but not inside the RT volume. It Is been left open the possibility of analyzing the results in p with mutated EGFR.

PRELIMINARY EXPERIENCE WITH PROPHYLACTIC CRANIAL IRRADIATION (PCI) USING HIPPOCAMPAL SPARING FOR SMALL CELL LUNG CANCER (SCLC) ON BEHALF OF GICOR. GOECP/SEOR

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Purpose: Prophylactic cranial irradiation (PCI) has become a standard of care for selected patients with small cell lung cancer (SCLC). Preclinical and clinical evidence suggests that radiation dose received by the hippocampus during whole brain radiotherapy may play a role in radiation-induced neurocognitive decline. To prospectively evaluate the neurocognitive benefit of hippocampal sparing, we have developed a phase III clinical trial (PREMER-TRIAL) to test hippocampal sparing during PCI. Sparing the hippocampus, poses important technical challenges with respect to contouring and treatment planning. Here in we report our preliminary experience with this approach.

Materials and methods: The first 17 patients treated with whole-brain radiotherapy with hippocampal sparing were reviewed. The hippocampus was contoured, and hippocampal avoidance regions were created using a 5-mm volumetric expansion around the hippocampus. Linear accelerator (LINAC)-based intensity-modulated radiotherapy (IMRT) and Volumetric Modulated Arc Therapy (VMAT) treatment plans were generated for a prescription dose of 25 Gy in 10 fractions.

Results: Mean volumes for the hippocampus, hippocampal avoidance region, and whole-brain (including the hippocampal avoidance region) were 4.7 cm^3, 30.5 cm^3 and 1716.0 cm^3, respectively. On average, the hippocampal avoidance volume occupied 1.7% of the whole brain planned target volume. These treatment modalities spared the hippocampus, with a mean dose of 10.2 Gy and maximum dose of 13.5 Gy. Dose to 2% and 98% of the whole brain PTV were 26.9 Gy and 21.7 Gy, respectively.

Conclusions: Modern IMRT techniques allow for sparing of the hippocampus with acceptable target coverage and homogeneity. Based on compelling preclinical evidence, a phase III cooperative group trial is ongoing to test the postulated neurocognitive benefit.

RADICAL ACCELERATED HYPOFRACTIONATED THREE-DIMENSIONAL CONFORMAL RADIOTHERAPY IN NSCLC PATIENTS

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Introduction: Increasing the radiotherapy dose can result in improved local control for non-small-cell lung cancer (NSCLC) and can thereby improve survival.This can be compromised by accelerated repopulation of tumour cells during radiotherapy. Accelerated hypofractionated radiotherapy (AHRT) can expose tumors to a high dose of radiation in a short period of time.

Purpose: Evaluate the feasibility of utilizing accelerated hypofractionated radiotherapy for the treatment of NSCLC patients.

Methods and materials: 73 patients (44 stage I-II without access to SABR and 29 local advanced NSCLC unfit for concurrent chemotheraphy) were included. Mean age was 78.2±7.9 years.The performance status (PS) was >2 in 49% of cases. The radiotherapy was delivered in 2.75 Gy fractions, once daily to a total dose of 66 Gy (BED10: 84 Gy). Sequential chemotheraphy (mainly platinum and vinorelbine) was administered in 95% of stage III patients.

Results: After a mean follow-up of 2 years, the median overall survival (OS) and cause specific survival (CSS) were 23 and 54 months, respectively. Table shows OS and CSS rates according to the stage. On multivariate Cox regression analysis, PS>2 was an independent risk factor for OS (p 0.0001) and CSS (p 0.0001). The major acute adverse reactions were grade 2 dermitis (18%), grade 2 esophagitis (10%) and grade 1 pneumonitis (30%). There were 32 patients with grade 1 late pneumonitis.

Conclusions: AHRT is a reasonable alternative to conventional fractionated radiotherapy in stage I-II NSCLC without access to SABR and in stage III patients unfit for concurrent chemotheraphy. PS>2 was an independent risk factor for OS and CS.

RADICAL TREATMENT OF THE PRIMARY IN PATIENTS WITH NEWLY DIAGNOSED NON-SMALL-CELL LUNG CANCER (NSCLC) WITH SYNCHRONOUS BRAIN METASTASES

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Purpose: To determine whether the presence of synchronous brain metastases at diagnosis may have a negative impact on overall survival in metastatic NSCLC patients.

Material and methods: Retrospective analysis of 31 metastatic NSCLC patients with synchronous brain metastases treated with Stereotactic Radiosurgery (STR) or Fractionated Stereotactic Radiotherapy (FSTR) from 2001 to 2013. Eighteen of them had one single brain lesion. Median FU was 38 months. Results obtained were compared to a control group of 27 metastatic NSCLC patients with metachronous brain metastases.

Results: Mean age was 59 years, and 67% of the patients had a KI of 90. Local control was 86%. Mean OS was 16.6 months compared to 39.9 months for the control group. Fifteen patients (48%) developed new brain metastases, median time to progression was 8 months. One-year survival probability estimate was 76% for the analyzed group and 95% for the control group, at 5 years from diagnosis it was of 38% in both groups. Patients with surgery to the primary lung tumor had an improved survival compared to those treated with chemo-radiotherapy, 63 months versus 28 months. Toxicity was scarce, ten patients (29%) presented radionecrosis, seven of them with no clinical implications, median time to the event was 10 months.

Conclusion: The presence of synchronous brain metastases at diagnosis should not rule out radical treatment of the primary lung tumor. Patients with synchronous brain metastasis treated with SRS or FSTR and surgery to the primary tumor achieve an improved survival.

RADIOLOGICAL ASSESMENT AFTER PULMONARY SBRT: A CASE REPORT

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Purpose: Assessment of response after pulmonary SBRT (Stereotactic Body Radiotherapy) may display different radiological patterns, which can differ from conventional radiotherapy (RT), mimicking tumor progressions. Carefully evaluation using international high risk CT criteria by trained radiologists can prevent misdiagnoses. We report a case of pseudo-progression after SBRT for pulmonary metastases.

Materials and methods: An 87-years-old male patient was treated for two colon cancer metastases in the left lung, one in the upper lobe and the other in the lower lobe as the only expression of his disease following PET/TC study. Time since primary surgery (pT3N1M0) was 24 months. Consistently with an oligometastatic state, patient was considered for SBRT (co-morbidities ruled out metastasectomy). A total dose of 50 Gy in 5 fractions non-consecutive days was delivered in both metastases. Follow-up was performed periodically by chest CT-scan.

Results: The radiological pattern of response between both metastases was different. Initially, both lesions showed a regression in size; however, at 6 months the upper one raised, nearly doubling baseline size in sharp contrast with lower one. Interestingly, at 12 month, comparable chest CT showed that the both lesions regressed similarly.

Conclusion: The early assessment was compatible with a dissociated pattern of response after SBRT. The radiological assessment of radiotherapy treatment response after lung SBRT must be performed by an expertise team taking in to account the international consensus for high risk CT features for local recurrence.

RADIOTHERAPY IN THYMOMA. EXPERIENCE IN OUR CENTER

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Purpose: Postoperative radiation therapy for thymoma is widely used, although the clinical benefits are controversial. The objective is to evaluate the outcome in patients with thymoma treated by resection plus radiation in our center.

Materials and method: A retrospective analysis of all patients treated for thymoma between 2006 and 2013: Stage I complete surgery (R0); Stage II: complete resection (R0) + adjuvant radiotherapy if margin near or affected, thymic carcinoma and carcinoid tumor; Stage III: complete resection + adjuvant radiotherapy. If not marginally resectable: assessing neoadjuvant treatment. If clearly not resectable: chemotherapy/radiotherapy or radiotherapy alone; Stage IV: Induction chemotherapy

followed by radiotherapy and/or surgery depending on the response. RT Dose: Neoadjuvant: 50 Gy at 2 to 1.8 Gy/fraction. Adjuvant-free or close margin: 1.8-2 Gy to 50 Gy/fraction. Adjuvant, affected microscopic margin: 1.8-2 Gy to 54 Gy/fraction. Unresectable disease or resection R2: 60-70 Gy to 1.8 Gy/fraction. QT: CAP (cyclophosphamide, doxorubicin and platinum) x 4-6 cycles. For this we used the SPSS statistical program.

Results: We have treated 7 patients with a median of age of 48 years, 1 patient with stage II, 6 Masaoka stage III. According to the WHO classification, 2 patients with stage B1, 2 patients with stage B2, B3 stage 2 patients and 1 patient stage C. The surgery was mostly R2 (3 patients), R1 (2 patients), 1 patient resection complete, all treated with posterior RT dose according to previous criteria, and one inoperable patients treated with neoadjuvant QT and subsequent RT. The toxicity most emphasized from our patients was esophagitis ≤2: 60% (4 patients). As for the response to treatment 6 patients had complete responses and one partial response patient. One patient experienced a relapse distance. Currently all patients are alive and 2 of them alive with disease. The median disease-free survival was 44 months and median overall survival of 53 months, with a follow-up of 3 years.

Conclusions: Surgical resection alone is sufficient for patients with Masaoka stage I and II, and those with WHO cell types A, AB, and B1. Furthermore, an optimal treatment strategy should be established for patients with Masaoka stage III/IV and WHO cell type B2/B3 thymomas.

RETROSPECTIVE STUDY OF IIIA NSCLC PATIENTS TREATED WITH CONCURRENT CHEMORADIOTHERAPY

Sánchez Aparicio, E.; Palacios Mena, E.; Rodríguez Domínguez, D.; Rodríguez Garrido, J.R.; Viñals Montes, P.; Diz Taín, P.

Objectives: From February 2010 to July 2013, 22 patients diagnosed with non-small cell lung cancer stage IIIA have been treated with concurrent QT-RT with radical intention in our center, treatment outcomes were analyzed retrospectively.

Material and methods: There are 18 men and 3 women with a mean age of 64 years. Histopathology: 11 patients were epidermoid carcinomas, 7 adenocarcinomas and 4 undifferentiated carcinomas. All patients receiving concurrent chemotherapy with CDDP-VP-16, except one who received taxol and carboplatin. The radiotherapy was performed in Clinac Linear Accelerator with 3D planning and IGRT. The total dose of radiation was administered between 60 and 70 Gy with an average of 65 Gy. Esophageal grade I toxicity was found in 60% of patients and grade II at 20%.

Results: With a mean follow-up of 27 months, overall survival was 42% and progression-free median survival is 30%. 6 patients had local progression and 7 distant metastases.

Conclusions: Despite of the limitations of a small restrospective study that does not allow to draw definitive conclusions, definitive bimodality therapy in patients with IIIA NSCLC in our study demonstrated favorable outcomes over other therapeutic approaches.

STEREOTACTIC BODY RADIATION THERAPY IN PRIMARY AND METASTATIC LUNG CANCER

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Purpose and objective(s): This is a retrospective analysis of toxicity, patterns of failure, survival and intra-fraction tumor motion, in patients with early-stage-lung-cancer (ESLC) and metastatic lung lesions (MLL) treated using Helical-Tomotherapy (HT) Stereotactic body radiation therapy (SBRT).

Materials and methods: From August 2011 to February 2015, 41 patients and 56 lung lesions (ESLC n=31, MLL=25, median diameter 21 mm (range, 4-49), centrally located n=30%), were treated with HT-SBRT. Twenty-one lesions were multiple. Internal tumor volume (ITV) was defined by considering the GTV at end inspiration/expiration breath on, with diaphragmatic compression (Body ProLock Civco®). Planned treatment volume (PTV) consisted of 5 mm radial expansion of ITV. SBRT schedule was 3×20 Gy, 3×18 Gy, 8×7.5 Gy, 4-5×12 Gy and 5×10 Gy, according to risk adapted criteria. Intrafraccion tumor motion was assessed by megavoltage-CT scan obtained prior to, in the middle, and at the end of each fraction.

Results: Acute RTOG toxicities were: Grade 1-2: 9%, Grade 3: 2%. Late RTOG toxicities were: Grade 1-2: 18%, Grade 3: 4% and no ≥G4 acute or late toxicities were seen. After a median follow-up of 8 months (range, 3-34), the 2-year actuarial local, locoregional control rates were 98% and 80%. The adaptative planning tool showed GTV displacements <2 mm (x, y and z axes) and GTVs were included within isodose of prescription dose in all cases. Ten patients had slight deterioration of their initial dyspnea and 58% patients had lung density changes on CT.

Conclusions: HT-SBRT is feasible, well tolerated treatment in lung tumors and daily image guidance allows high accuracy and precision radiation delivery into the tumor volume.

THE NEW ARISING OF RADIOTHERAPY IN METASTATIC NON-SMALL-CELL LUNG CANCER (NSCLC)

Samper, J.; Santamaría, P.; Chust, M.; Ortí, M.; Megual, J.L.; Guinot, J.L.; Pesudo, C.; Mut, A.; Campo, V.; Arribas, L.

Purpose: To describe the role of Radiotherapy as a key part of the treatment for metastatic NSCLC patients. As new and more precise technology is taking place Radiotherapy is emerging as an attractive radical local treatment option.

Material and methods: A review of recently published literature from pubmed. http://www.ncbi.nlm.nih.gov/pubmed.

Results: Old concept: Radiotherapy in metastatic NSCLC is indicated as palliative treatment to alleviate clinical symptoms derived from both the primary tumor and the metastatic spread of the disease. Planning and treatment implementation should be simple, less time-consuming and not very expensive. New Concepts: Systemic treatment continues to be the gold standard for this patients; however clinical indications of Radiotherapy in oligometastatic patients have been expanded, new trends include: radical irradiation of oligometastases (mainly brain, lung, liver, adrenal glands); irradiation of the primary thoracic disease; irradiation combined with systemic therapy; integration of radiotherapy in "Early Palliative Care". The term "oligometastatic" refers to patients with a limited number of metastasis or metastatic sites, that may have a more indolent tumor biology and progression pattern. Patients with less than 5 metastases in total could be "curable" or boast long survival times when given a radical local treatment to all metastatic sites, with surgery or radiotherapy, along with systemic treatment. Stereotactic Body Radiotherapy (SBRT) and Stereotactic Radiosurgery (SR), an ablative treatment delivered in 1 to 5 fractions, can be used as radical treatment in several metastatic sites and it is becoming an attractive treatment option. There is a new tendency to bring palliative care earlier in the process of cancer treatment, as it improves quality of life, prevents mood downfalls and controls clinical symptoms as they appear. Radiotherapy should play an important role in this ongoing change.

Conclusion: We are improving the prognosis of metastatic NSCLC patients by using new and more precise oncologic treatments, and by integrating them together, with supportive care, earlier in the course of the disease.

SARCOMAS

EXTERNAL RADIOTHERAPY FOR A METASTASIC HEMANGIOPERICYTOMA. CASE REPORT

Feltes, N.; González, J.; Solé, J.M.

Introduction: Hemangiopericytoma is an uncommon vascular tumor that arise from Zimmerman's pericytes, the contractile cells surrounding capillaries. It behaves aggressively, showing distinct tendency to recur locally or distantly along the neural axis and to present extraneural metastases.

Objectives: To describe a rare case of primary hemangiopericytoma of the cranial cavity with bone and visceral metastasis and review treatment with radiotherapy exclusive.

Methods and materials: A 45-year old man was diagnosed of a large tentorial hemangiopericytoma. Surgical resection was performed with 4 relapses, the last one in 2009 received postoperative radiotherapy. Although local growth control of the tumor was obtained by tumor removal and irradiation, in a medical control resonance revealed a tumor invading 5th cervical vertebra and 3th lumbar vertebra both with intraspinal component and a solitary hepatic lesion. The histological findings of hepatic lesion were characteristic of hemangiopericytoma. No surgical treatment was possible. The patient was treated exclusive with radiation therapy to a total dose of 42.5 Gy in once-daily (2.50 Gy fraction) over 5th cervical vertebra and 45 Gy in once-daily (2.50 Gy fraction) to 3th lumbar. Chemotherapy was administrated after.

Results: The MRI revealed stabled lesion at the present, in the follow-up of the last 12 months.

Conclusion: Radiotherapy has demonstrated to be a valuable modality for local control in inoperable bone metastasis of hemagiopericytoma.

GIANT CELL TUMOR OF THE SACRUM: A CASE REPORT

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Introduction: Giant cell bone tumor (GCBT) is a benign but locally aggressive neoplasm that accounts for 3-5% of all primary benign bone tumors, with high risk of local recurrence and low risk of distant metastases. The vast majority are treated with surgery. In Sacrum locations (6% of cases), in which complete resection has a high risk of post-operative sequelae, radiotherapy (RDT) and new monoclonal antibodies may be treatment options. We report the case of a patient with a histologically proven sacrum giant cell tumor (SGCT).

Material and methods: We describe the case of a 49-year-old man presented with lumbosacral pain and lower limb motor deficit. CT-scan and MRI showed osteolytic destruction of the S1-S2 bones and a huge soft-tissue mass with intraspinal extension. A biopsy was performed with results for SGCT. Tumor Board considered the lesion as unresectable (Campanacci Grade III), and treatment with monthly RANKL inhibitor Denosumab plus RDT was decided. An IMRT treatment was performed up to 66 Gy with no acute urinary or rectal toxicity reported.

Results: To date, patient has received 1 year of Denosumab. Clinically, epidural catheter is required for effective pain relief, but he is able to walk on crutches and sphincter are preserved. Last CT-scan show partial response with higher grades of calcification.

Conclusions: Modern Radiotherapy techniques based on CT/MRI imaging and new targeted therapies could be an alternative in patients with SGCT not amenable to function-preserving surgery. High local control rates and improvement in clinical symptoms are achievable without severe acute or late toxicity.

HYPOFRACCTIONATED RADIOTHERAPY WITH SIMULTANEOUS INTEGRATED BOOST FOR BREAST CANCER: RESULTS OF ONCOSUR GROUP

Rivas Sánchez, D.; Serradilla Gil, A.; Bezares Alarcón, A.; Lazo Prados, A.; Gómez Oliveros, J.; Alvarez Mateos, D.; Arregui Castillo, G.; Chaves Barbosa, A.; López Ramírez, E.; Ristori Sola, A.

Introduction: Breast-conserving surgery followed by whole breast irradiation is a standard treatment of breast cancer. The application of postoperative radiotherapy reduces by two-thirds the risk of 10-years local recurrence and increase the rate of 10-years survival by 5%. There are radiobilogical reasons justifying the use of hypofracctionation in breast cancer. Since the $\alpha/ß$ value of breast cancer has been estimated around 4 Gy. However, this doses may also increase the frequency and severity of side effects in normal tissues.

Objectives: According to the results published of four phase III trials that compared standard treatment versus hypofractionated treatments, we started in our centers, a hypofractionation protocol with SIB after conservative surgery in patients with breast cancer. The purpose of the study is to communicate the preliminary results.

Materials and methods: 105 patients with breast cancer were treated between 2012 and 2014 by hypofractionation regimen and a simultaneous integrated boost to the tumor bed in those patients at high risk of local recurrence.

Results: The median age of the patients was: 57 years (25-87). Tumor size (TNM): In situ: 10% (56 patients), T1: 69%, T2: 20%, T3: 1% Surgery of the axila was lymphadenectomy in 25% and sentinel node biopsy in 70%; positive axillary nodes were found in 15%. The median prescribed dose to the whole breast was 42.56 Gy, with a fractionation of 2.66 Gy. Median additional boost administered was 7.98 Gy. Acute skin reactions (toxicity criteria RTOG): G0: 28%, G1: 56%, G2: 10%, G3: 2%, there was no G4 toxicity. There were no acute adverse cosmetic results (assessed in agreement with the Harvard criteria).

Conclusions: The explored hypofractionated radiotherapeutic approach for conservative breast cancer seems to be feasible providing consistent clinical results with excellent short-to-medium-term toxicity profile.

IMPLEMENTING VOLUMETRIC-MODULATED ARC THERAPY FOR EXTREMITY SOFT TISSUE SARCOMAS

Llacer Moscardo, C.; Bourgier, C.; Riou, O.; Azria, D.; Fenoglietto, P.; Carrere, S.; Ailleres, N.; Morel, A.

Objectives: To report our experience on volumetric-modulated Arc Therapy (RapidArc) for extremity soft tissue sarcomas focusing on dosimetric and early clinical results.

Methods and materials: Between July 2012 and December 2014, twelve patients with primary extremity STS were treated with surgery and adjuvant RapidArc. Eight patients had R1 and four R0 resection. CTV1 was defined as the tumor bed plus 5cm in longitudinal and 2 cm in radial axis. PTV1 was obtained expanding 1 cm around CTV1. PTV2 was surgical bed plus 2 cm.

Organs at risk (OAR) and dose constraints were defined. Mean prescribed dose was 59.5 Gy [54-64 Gy]. RapidArc plans were designed to adequately treat the target volume and spare OAR. Dose distribution and dose volume histograms (DVH) were analyzed. Toxicity was assessed using CTC v.04 criteria. Local control was evaluated.

Results: Mean PTV1 volume was 1390 cc [602-3545 cc]. Mean D95% was 56.38 Gy [51.27-59.07 Gy] and mean V95% was 94.66% [89.73-96.20%]. Mean skin dose was 23.83 Gy [19.5-30,05 Gy] V40 and V60 Gy to the femur were 25.91% and 2.14% respectively. Ipsilateral healthy tissues received a mean dose of 15 Gy [9-20 Gy] and mean dose to the contralateral limb was 3.47 Gy [1.27-6.73]. With a median follow-up of 19 months [2-30 months] local control was 100%. No G3 toxicity was observed.

Conclusion: Volumetric-modulated arc therapy for extremity STS has been implemented in routine at our center with a favorable morbidity profile and excellent early local control. Longer follow-up is necessary to confirm those results.

INSTITUTIONAL EXPERIENCE OF NEADJUVANT RADIOTHERAPY IN SOFT TISSUE SARCOMAS

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Purpose: To asses the results (overall survival (OS), cause-specific survival (CSS), local failure (LF), distant failure (DMFS) and wound healing complications) in soft-tissue sarcoma (STS) treated in our institution with preoperative radiotherapy.

Methods and materials: Retrospective analysis of 20 first patients treated with preoperative radiotherapy (50 Gy in 25 sessions) from Dec 2007 to Nov 2014. To evalue wound healing complications we consider all 20 patients but in the control disease analyses we excluded 4 patients (2 with metastases at diagnosis and 2 with definitive histopathologic result of melanoma metastases and rabdomyosarcoma).

Results: The median follow-up was 14.6 months (1-69 months). 6 patients (30%) had wound healing complications (1 by pass thrombosis and 5 cutaneous necrosis, 1 with amputation) and not related (p>0.05) with previous vascular disease, tumor size, age or anatomical site. No patient has local failure. % of necrosis in post-surgery pathologic result was considered radiotherapy response. 60% of patients had 50% necrosis and 20% 80%. The 2-years OS, CSS and DMFS was 75%, 80% and 70% respectively. 8 patients (50%) died, 6 disese progresión, 1 infection and 1 second tumor progresión). No stadistical diference for CSS and DMFS in tumor grade, tumor size, tumor stage and anatomical site.

Conclusions: The preoperative radiotherapy had an aceptable wound healing complications and the control tumor results, with no local failure, was agree with the bibliography, but we need mor follow-up and number of patients.

INTRAOPERATIVE RADIOTHERAPY (IOERT) AS BOOST IN SOFT TISSUE SARCOMAS

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Purpose: To assess the efficacy of intraoperative electron beam radiotherapy (IOERT), in terms of local control, in the treatment of soft tissue sarcomas (STS).

Material and methods: Seventeen patients with histologically confirmed STS, were retrospectively analysed. The location were in extremities (11), and trunk/retroperitoneal (6). All patients underwent surgical resection, IOERT using electron beam radiotherapy, and most of them (15/17) received postoperative external beam radiation therapy (EBRT) with a median dose of 46 Gy (range: 40-50). Eleven patients were treated for primary tumor and 6 for tumor recurrence. Median age was 64 years (range 41-84). Histologic type was liposarcoma (35.3%), myxofibrosarcoma (17.6%), leiomyosarcoma (11.7%), and others. IOERT was delivered by using electron-beams (range energy: 4-12 MeV, median 9 MeV). Median dose was 12 Gy (range 12-15 Gy), with an applicator of 8 cm diameter (6-12).

Results: With a median follow-up of 28 months (range 2-84 months), overall survival was 82.3% and disease free survival was 76.4%. Distant metastases occurred in 4 patients (two of whom developed also locoregional relapse). Two patients died with recurrence (22 and 23 months after IOERT), and one patient died of multiple organ failure related with anesthesia, two months after surgery. The most common acute effects were lymphedema and delayed healing. A case of severe late toxicity, with osteoradionecrosis of the humeral head, was observed.

Conclusion: IOERT used as a boost to EBRT provides excellent local control, with limited acute toxicities, in patients with STS. IOERT is a feasible and safe treatment in these patients.

LEIOMYOSARCOMA OF THE INFERIOR VENA CAVA. A CASE REPORT

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Leiomyosarcoma of the inferior vena cava is a rare malignant tumour which is originated from the smooth muscle fibers of the media. Because of a low prevalence and due to the lack of evidence from large series, no consensus has been reached on the surgical management and the role of adjuvant treatment. We present a 58 year old female patient with lumbar pain and abdominal ultrasound showing a retroperitoneal mass. The CT and Angio-MRI manifested a hypervascular mass with necrotic areas of 62x40x43 mm originating from the wall of the inferior vena cava. A whole-body F-18 FDG PET/CT was done and revealed high grade uptake suggestive of malignancy. Biopsy confirmed the histology of Leiomyosarcoma. The patient underwent resection of the primary tumour and radiotherapy was administered postoperatively with IMRT technique at a dose of 50 Gy in 25 fractions to the surgical bed. A review of the literature shows that radiation therapy could be beneficial for local control, however it would be necessary to standardize the use of radiation therapy and dose in these types of tumors.

OPTIMIZATION OF CT/MRI FUSION AS A QUALITY STRATEGY IN RADIOTHERAPY

Rivero Silva, M.; Rincón Pérez, I.; Velázquez Miranda, S.; Montero Perea, E.; Campos Triviño, B.; Ortiz Gordillo, M.J.

Objectives: Planification of soft tissue lesions in radiation therapy is conditioned by the difficulties in contouring these structures in CT images, especially after surgical manipulation. MRI has been shown to improve delineation accuracy and inter-observer reproducibility during radiotherapy planning. CT images in limb radiotherapy require a patient positioning very different from the acquisition of images in MRI. Our objective is to change it radically, introducing a new device that makes possible treatment positioning of the patients inside the antenna of the resonance.

Material and methods: We designed an immobilization system composed by a soft fabric bag containing expanded polystyrene beads coated in a moisture-cured resin with a thermoplastic mask in a baseplate MRI compatible. Due to the devices plasticity, the system adapted with high precision to the extremity anatomy, and allowed the placement of the MRI antennas to obtain the images. All materials were radio-transparent and did not conduct electricity, so we used the same devices in CT and MR simulation. We obtained 2 mm thickness images, and fused it with 2 mm T1 contrast fat suppression MRI images in similar conditions. We practiced diary IGRT and imparted the treatment with VMAT.

Results: The immobilization system was employed in three patients. The major differences between the edges of MRI and CT were less than 1 mm. We did not register any grade IV toxicity.

Conclusions: Optimization of CT/MR fusion supposes an effective tool in the design of radiotherapy treatments of soft tissue lesions and allows more conformed plans with less toxicity.

PALIATIVE TREATMENT OF RETROPERITONEAL LEIOMYOSARCOMA: A CASE REPORT

Carrizo, V.; Baquedano, J.E.; Garcia, E.; García, V.; Mira, M.; Ruz, L.; Forner, A.; Ripol, O.; Monfá, C.; Carceller, J.A.

Background: Retroperitoneal sarcomas are uncommon malignant tumors locally aggressive, with poor prognosis and most frequently difficult to treat due to the large size and the involvement of adjacent structures. We present the case of a 68 year old man that was diagnosed of psoas leiomyosarcoma as an incidental finding.

Case report: This patient was diagnosed because he had an abdominal CT done, and it showed two pelvic masses in the left psoas muscle that destroyed the iliac bone. Due to this bone affection it was considered locally advanced unresectable. We started treatment with chemotherapy based on Gemzitabine. After 3 months of treatment, there was no clinical response to the treatment and one of the masses had increased. Add to that the patient began to refer back pain that was slightly controlled with medication. We have delivered 5000 cGy to these remaining masses and 4 month later, we have achieved notable pain relief and no clinical progression of the pelvic tumors.

Conclusions: A multidisciplinary approach is needed to decide the best choice of treatment. Radical resection followed by chemoradiotherapy is a key for this type of tumors. In this case, due to massive bone affection, surgery was not an option and no response to chemotherapy was showed after treatment. Radiation treatment achieved pain control and might be a good option for symptomatic relief and palliative local control.

PERICARDIAL SYNOVIAL SARCOMA: A CASE REPORT

De la Pinta Alonso, C.; Hernánz De Lucas, R.; Muñóz Migueláñez, M. T.; Polo Rubio, J. A.; Ramos Aguerri, A.

Background and purpose: Pericardial synovial sarcoma (PSS) is a rare malignant soft-tissue tumor. Early diagnosis and multimodal management improves patient outcome. We present our experience of a forty-year-old man with this tumor.

Case report: The patient went to emergency services in June-2014 because of chest pain. His diagnostic was pericarditis. After his improvement, he was discharged. Four months later he started with similar symptoms and was found to have massive pericardial effusion. On imaging tests, a giant pericardial tumor lesion was objectived. For this reason, he undergoes surgery on October 2014. Inmunohistochemistry and histopathological sections reveal tumor cells positive for bcl-2, CD99, vimentine,with Ki67 at 50% with delecion genSS18. The patient had a good clinical evolution but the control CT three months later, showed tumor persistence. In a multidisciplinary committee was decided resection of the tumor. On December the 19th, 2014, surgeons proceed to the dissection of all the accessible tumor masses. On December the 23rd, 2014, the patient underwent a CT in which a significative reduction of the mass could be objectived. We planned adjuvant treatment with radiotherapy with a total dose of 45 Gy (1.8 Gy per fraction) with a good tolerance of the treatment. Patient had finished the treatment in this moment.

Conclusion: PSS diagnose is difficult not only because of its localization but also due to its aggressive disease. Using all the available medical methods is important to avoid progression and recurrence of this kind of tumors. Multidisciplinary treatment is necessary and radiotherapy is a good and safe option.

RADIATION-INDUCED BREAST ANGIOSARCOMA: A CASE REPORT

González Castro, A.; López Lóuzara, M.L.; Triñanes Pérez, A.; Núñez Losada, A.; Orden de Frutos, A.; Marcos Pérez, M.P.; Vázquez Rodríguez, J.; Muñoz Garzón, V.

Introduction: Induced angiosarcomas are rare tumours that develop from the dermis of the breast, at 4-7 years after conservative surgery with subsequent radiotherapy. They appear in the irradiated area with an incidence of 0.09% to 0.16%.

Clinical case: We present the case of a 67-year-old woman that was diagnosed in November 2005 of a ductal invasive GIII carcinoma in the left breast, and negative hormonal receptors. She was treated with conservative surgery and lymphadenectomy. Stage pT2pN0M0. Subsequently, she was given 4 cycles of chemotherapy and breast radiotherapy of 50.4 Gys, and a boost of 10.8 Gys. In January 2011, we observed an erythematous lesion that was pathologically positive for radiation-induced low-grade angiosarcoma. We performed a modified radical mastectomy, where we observed a 7×5 cm GII lesion, with skin involvement, but with free edges. We considered adjuvant chemotherapy. In May 2013, we noted local recurrence, which we treated with resection and a graft. In October 2014 the patient suffered a new relapse. In December, we performed resection of the entire left chest wall (including the pectoralis major) with the anterior flap. In January 2015, the patient was referred to our service for flap failure and continual capilar bleeding with subsequent anemia. The patient received haemostatic radiotherapy at 40 Gys.

Conclusions: Induced angiosarcoma is an aggressive tumour with 70% recurrence after mastectomy and survival at 5 years of 35%. The prognosis varies according to size and histological grade. We must consider it in patients with a history of local radiotherapy in this area, and unspecific lesions.

RETROPERITONEAL IMPLANTS CONTROL AFTER VMAT IN A RETROPERITONEAL LEIOMIOSARCOMA PATIENT

Soler Catalán, P.; Morales Marco, J.C.; Vicente García, V.; Francisco Andreu, F.; Tortosa Oliver, R.; Chinillach Ferrando, N.

Introduction: The irradiation of retroperitoneal relapse implants remains nowadays a challenge for the tumor control of patients diagnosed with Retroperitoneal leimiosarcoma. It is not unsual that these retroperitoneal implants are unresectable and the treatment options become less promising. If a certain dose of Radiotherapy is achieved, the goal of free relapse time tumor control can be a reality.

Objectives: To suggest a treatment chance in patients with difficult histology and anatomic locations, with an accurate Radioterapy.

Methods: A 73 year old patient diagnosed with retroperitoneal liposarcoma, which underwent several tumor relapses with surgical resection, presented in the follow up, three new implants. After chemotherapy regimen (2 cicles) the lessions stayed as described below:

- Implant one: 20×13,6 mm, cranial to left renal vein.
- Implant two: 15×14 mm, retroperitoneal fat, anterior to the caudal side of the left Kidney.
- Implant three: several nodes in iliac bifurcacion.
- Radiotherapy schedule:
- VMAT technique was used (6MV photons).
- 33 sessions (1.8 Gy/fraction), Total Dose: 59.4 Gy.
- PTV1: involved field area, with the lymphatic area + 3 implants.
- 45 Gy (25×1.8 Gy/fr).
- PTV2: 3 implants + 1 cm margin.
- 14.4 Gy (8×1.8 Gy/fr).

Results: In the TAC control after Radiotherapy, 3 months after, the lessions haven´t grown.

Conclusions: We conclude that, although histology and anatomic location can be a handicap, VMAT can be an alternative in some unresectable lessions.

TREATMENT OF SPINAL CHORDOMA WITH PHOTON-BEAM RADIOTHERAPY

Lucas, A.; de Blas, R.; Lozano, A.; Pino, F.; León, D.; Mateos, E.; Najjari, D.; Galdeano, M.; Piñeiro, R.; Navarro-Pérez, V.

Objective: To evaluate short-term results in patients treated with photon-beam therapy for spinal chordoma.

Material: We report on 16 patients with histologically proven spinal chordoma treated at our center since 2008. The location of the chordomas was as follows: sacral (9), lumbar (5) and cervical (2). All cases were primary except for two cases of multifocal relapse. Previous surgery was complete only for 2 patients. Intensity modulated radiotherapy (IMRT) was used in 15 of the 16 cases (dynamic in 53% and volumetric in 47%). The treatment volume range was wide, depending on the location (21-969 cc) and prescribed median dose was 72 Gy (70-79 Gy). Overall survival and local control were obtained using Kaplan-Meyer estimator.

Results: Treatment was well tolerated by all patients, with only a single case of grade 3 acute dermatitis. Local control and long-term toxicity were evaluated in the first 14 patients, with a local control rate of 61.5% and overall survival of 100% at two years after a median follow up of 32 months (range 9-68). We have not identified significant prognostic factors related to local control; however salvage treatment seems to have poor prognosis comparing to primary treatment (HR 5.6, 0-92.3 95% CI). No severe chronic toxicity was observed.

Conclusions: High-dose modulated radiotherapy enables management of spinal chordomas with photon therapy because this technique permits the administration of the high doses needed to achieve local control without severe toxicity. However, more patients are needed to evaluate treatment prognostic factors related to tumor control.

WHOLE LUNG IRRADIATION IN EWING SARCOMA

García Cañibano, T.; De Torres, M.V.; Caballero, B.; Hurtado, A.; López, A.

Introduction: Ewing sarcoma (ES) is the second most common type of bone cancer in young adults. 5 year DFS in metastatic ES is 30%. Whole lung irradiation (WLI) was performed in patients with primary pulmonary metastases in European Intergroup Cooperative Ewing´s Sarcoma Study (EICESS-92) after complete clinical remission following chemotherapy. We report a clinical case and explain this not well-known technique.

Case: 25 year-old man, was diagnosed in 2005 of ES right low limb (tibia). He was treated with neoadjuvant chemotherapy (AEI-VAC) and above-the-knee-amputation. After 7 year follow-up period, in March 2012, chest CT showed a lung nodule. It was positive in PET-CT and the histology confirmed ES metastasis. He was treated with chemotherapy, 6 cycles of IE. Reevaluation CT showed complete response of the lung nodule. Following he received low-dose bilateral lung irradiation 18 Gy, in daily 1.5 Gy, with IMRT to protect heart and liver. He continued chemotherapy to February 2013. Pulmonary function tests were performed before and after the treatment, without pulmonary function abnormalities. With a follow-up of 25 months, no recurrence was demonstrated in chest CT. The patient is asymptomatic.

Discussion: Retrospective reports like CESS and EICESS trials suggest that WLI benefits patients with ES lung metastasis. The doses recommended are 15-18 Gy. In EICESS-92 WLI is performed even if complete remission was achieved after chemotherapy. This technique improves survival compared with that of historical controls.

Conclusion: Whole lung irradiation is a safe, well-tolerated treatment that seems improve survival in patients with pulmonary metastases.

SBRT

4CD RESPIRATORY ASYNCHRONY MANAGEMENT IN SABR

Rivero Silva, M.; Montero Perea, E.; Velázquez Miranda, S.; Rubio Jiménez, M.; Ortiz Gordillo, M.J.

Suprarrenal glands are contained in an inverted cone shape between Gerota and Zuckerland´s fascias. Diaphragmatic movements determine kidneys and suprarenal displacement inside this space. This movement is not synchronic, and is influenced by the abdomen pressure and peristalsis. This phenomenon difficulties 4DCT simulation. We describe a suprarrenal control movement strategy with CT-MRI-ConeBeamCT in the treatment of adrenal oligometastases with stereotactic ablative radiotherapy (SABR).

Material and methods: We performed a SlowCT simulation fusioned with conventional diagnosis images obtained with a stereotactic simulation device patented by our institution. This devoce does not contain carbon and can be introduced inside the MRI to obtain more reliable volume definitions. We employed dampening procedure with retroabdominal pressure bettween the iliac crest and the last floating rib, and frontal pressure in the ribcage, moving the kidney to a superior position in the Gerota and Zuckerland´s space to minimize its movement. This strategy is more comfortable than others dampening procedures, is not invasive and reduces the treatment time. The planification is designed with non-coplanar beams allowing a high doseage gradient. We obtained ConeBeamCT images after and before the sessions to obtain an approximate record of interfraction and trafration variability. We verified the position with diary IGRT.

Results: 3 patients with adrenal oligometastases received SABR. The medium CTV volume was 13 cc. The medium surveillance was 10 months. We did not registered any local failure neither grade 4 toxicity.

Conclusions: Our dampening abdominal procedure allows reproducible, comfortable and efficacy SABR treatments in adrenal oligometastases.

ADAPTIVE RADIOTHERAPY FOR STEREOTACTIC BODY RADIATION THERAPY IN ADRENAL GLANDS.

Francés Muñoz, A.; Beato Tortajada, I.; Conde Moreno, A.J.; Morillo Macias, V.P.; Muelas Soria, R.; Rodriguez Cordón, M.; Ferrer Albiach, C.; Bouché Babiloni, A.; Sánchez Iglesias, A.; Garcia Mollá, R.

Purpose: To present a dosimetric analysis of a patient treated with Stereotactic Body Radiation Therapy (SBRT) for adrenal metastases using retrospectively adaptive radiotherapy (ART). Diferences between prescribed dose and delivered dose in this patient case.

Material and methods: We replanned contours of the GTV (gross tumor volume) and the organs at risk on the 3 daily cone beam CT images after deformable image registration. ART dose distributions were compared to the dose from the IMRT plan using dose-volume histograms.

Results: In the GTV volume the delivered fraction dose was superior to the planned fraction dose except for the third treatment fraction, where the GTV was under-dose. Despite this, the accumulated delivered dose in the GTV D98 was 3352 cGy and the planned accumulated dose D98 was 3346 cGy. All organs at risk complied the clinical goals.

Conclusions: This patient was treated accurately. It remains to be seen wether the possible incremental normal tissue sparing we can achieve with ART translate into clinical benefit. Randomized clinical trials will be necessary.

CLINICAL RESULTS OF SPINE METASTASIS TREATED WITH STEREOTACTIC RADIOSURGERY

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Objective: Pain caused by spinal metastases deteriorates the quality of life of the patients. Stereotactic Radiosurgery can achieve pain relief and local control without significant toxicity.

Material and methods: We retrospectively analyze 49 spine metastases in 37 oligometastasic patients, treated within November 2008 and February 2015 with single fraction 18 Gy Radiosurgery. Thirty three patient had pain at treatment time, pain was measured with the visual analogue scale (VAS). Objective in pain control was divided as: pain control (VAS=0), pain relief (decrease on VAS>3) and no relief (decrease on VAS≤2). Local control was defined as absence of local tumor progression.

Results: The pretreatment mean VAS pain was 4,16 (0-8), after Radiosurgery the mean VAS was 0,9 (0-7), with a significant reduction on the mean pain perception on Wilcoxon test (z=-4,7; p<0,0001). Twenty eight patients have improved their pain after treatment, with 63% of the patients achieving pain control, 21% pain relief, 9% no pain relief, and 6%, pain worsening. Overall local control was 95.8%, the estimated local control at 3 and 4 years was 97% and 85% respectively, the median local control time was not achieved yet. Renal histology has significantly worse local control than other types (p<0.0001). The estimated 1 and 2 year survival was 61% and 57% respectively. The treatment related toxicity was 1 case (2%) of G-II oesophagitis, and 3 (6.12%) post-radiosurgical vertebral collapses.

Conclusions: Stereotactic Radiosurgery in spine metastases achieves an important pain relief while maintaining a high local control. No significant toxicity was found.

COMPARING ITVS FROM 4D-CT-PET AND BREATH-HOLD TECHNIQUE WITH ABDOMINAL COMPRESSION

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Objectives and purposes: Stereotactic Body RadioTherapy is highly effective in controlling oligometastatic cancers at locations throughout abdominopelvic, thoracic, spinal and paraspinal sites due to higher biological effective dose of high doses delivered in few fractions. SBRT requires high accuracy of dose delivery to minimize normal tissues toxicity. It is mandatory to have a precise target delineation and patient immobilization. In this work we compare internal target volumes, due to organs motions, defined using breath hold technique with abdominal compression and 4D-CT-PET, for a patient affected by a liver metastasis.

Materials and methods: A Visicoil (IBA-Dosimetry) was implanted in patient's liver next to the metastasis for later tumour localization. Patient was immobilized using a Oncoform vacuum cushion (Schmidt). During first CT simulation abdominal compression was applied using Body Pro-Lok™ (Civco) and five studies were acquired with GE LightSpeedRT: a scan of patient abdominal region with normal breathing, followed by four scans of tumour region respectively with normal, inhalation hold, exhalation hold and normal breathing. This five studies represent a sample of tumour positions during compressed breathing. The second study was realized using a Philips Gemini TF CT-PET equipped with Pulmonary Toolkit for pulmonary gating. The study provided tumour position in 4 different respiratory phases. After studies registration in our Pinnacle planning system (Philps) we were able to compare tumour shape, positions and volumes measured with both methods.

Results: ITV is of 9.45 cm^3 with method 1 and of 12.11 cm^3 for method 2. ITV show the same position and shape in both studies. Volume differences might depend from abdominal compression.

CONE-BEAM COMPUTED TOMOGRAPHY FOR IMAGE GUIDANCE OF LUNG STEREOTACTIC ABLATIVE RADIOTHERAPY

Fandiño, J.M.; Veiras, M.; Candal, A.; Díaz, I.; Fernández, C.; Gesto, C.; Izquierdo, P.; Poncet, M.L.; Soto, M.; Triana, G.

Background and purpose: Stereotactic ablative radiotherapy (SABR) offers a non-invasive treatment modality for patients with early-stage (stage IA or IB) non-small cell lung cancer (NSCLC) not amenable to surgery because of medical reasons or patient refusal. We report our initial experience with Cone-Beam Computed Tomography (CBCT) for On-Line Image Guidance of Lung Stereotactic Ablative Radiotherapy using the kilovoltage imager integrated into our linear accelerator.

Materials and methods: Between 2012 and 2014, 31 selected patients (T1-2N0 non–small-cell lung carcinoma) were treated with SABR delivered using online cone-beam CT guidance to a total dose of 60 Gy in 3, 5 or 8 fractions, depending on tumor size and location. Dose was prescribed to 80-90% isodose, where possible covering 95% of PTV. No external rigid immobilization was used (only arm and knee support) and no active motion management or respiratory gating was performed for any patient. Initial daily setup was according to patient skin tattoos, for each fraction a CBCT was performed for tumor localization and registered

to the planning CT using soft tissue registration of the target. Patients were treated in the on-line corrected position after automatic couch corrections. A final CBCT after treatment assessed intrafraction tumor displacement. We reviewed the tumor inter- and intrafractional displacements in a total of 191 fractions for this 31 patient cohort; matching based on the bony anatomy was also performed retrospectively.

Results: A total of 382 CBCT images obtained (with the patient in the treatment position) immediately before and after each fraction were analyzed. On treatment localization imaging demonstrates that initial positioning deviations from skin markings exceeding 5 mm occur in approximately 40% of all delivered fractions. The mean displacement between lesion localization derived from soft-tissue (tumor) and bony matching was greater than 5 mm, and exceeded 10 mm about 10% of the time. Therefore, relying on bony anatomy as a surrogate of the target can result in suboptimal localization and verification. The mean intrafraction deviation from localization of the tumor to the end-fraction CBCT was 3±1 mm, therefore the baseline shift was minimal over treatment session.

Conclusions: CBCT image-guidance to the tumor is a more accurate means of localization than using bony landmarks, reducing the probability of geographic miss or an overexposure of healthy tissues to radiation. Our preliminary experience indicates that CBCT-guidance using soft-tissue matching on the tumor itself, rather than the bony anatomy of the patient, is essential because lung patients can have large set-up errors due to changes in anatomy between CT and treatment, weight loss, body rotations and arm positioning variability. Using CBCT image guidance, high geometric accuracy is achievable for target positioning, potentially leading to improved outcomes and empowering adaptive radiation therapy for lung cancer.

ELECTION OF FIDUCIALS IN SBRT FOR LIVER METASTASES WITH TOMOTHERAPY

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Goal and purpose: to evaluate different thicknesses fiducial markers for localization of liver metastases treated with SBRT in tomotherapy unit.

Material and methods: After insert of two gold fiducial Visicoil of 0.35×10 mm in a patient with liver metastases, were not visualized on the tomoimage acquired prior to treatment, none of its acquisition modes. Subsequently carried out a study on mannequin with gold fiducial markers following: Visicoil 0.35×10 mm, 0.75×10 mm and 0.5×10 mm, Fleximarc 0.9×10 mm, Lorca Marín 1×3 mm and 1.2×5 mm. A CT similar to the plannining CT of reference was acquired of a solid water 30 cm phantom, with fiducial markers in cylinders bolus inserted.

Results: The acquisition of mannequin tomoimages (3 MV) with the three image sizes available (fine pitch, normal and coarse) allowed visualization of all markers (except the 0.35×10 mm fiducial not visualized in the coarse mode). The difference with the patient is due to respiratory motion, which causes a decrease in marker contrast. However the use of intrahepatic fiducial Visicoil of 0.75×10 mm was correctly displayed in a second patient tomoimage.

Conclusions: The high contrast of gold makes the smallest fiducial mark (0.35 mm) is visible in the tomoimage in a static mannequin, however respiratory motion, averaged several times for the rotation period of the gantry in tomoimage (10 s) causes a decrease in contrast, that prevents viewing.

FIRTS STEPS OF SBRT-SG 05: FAVORABLE WORK IN PROGRESS

Conde-Moreno, A.J.; Ferrer-Albiach, C.; Muelas-Soria, R.; Macías-Hernández, V.; López-Ramirez, E.; Morera-López, R.; Rubio-Rodríguez, C.

Aim: SBRT-SG 05 is the first national study of treatment of prostate cancer oligometastases (OPCa), the intention is to describe its justification, the steps set, difficulties in their development and first results. This type of studies are currently on the rise worldwide representing interest for this kind of approach.

Material and methods: In 2014 the SBRT-SG 05 study was presented in order to determine the rates of local and symptomatic control of OPCa treated with SBRT. Secondary objectives are biochemical progression rates, progression free survival, chemotherapy-free survival, overall survival, analyze toxicities and the quality of life before and after treatment. This study is a collaboration of SBRT-SG, GICOR and SEOR.

Results: To date, the study is being handled by 16 national ethits committees and at this time has affirmative answer in 5 of them. Despite the classification by the Spanish Medicines Agency as "NO-EPA" study, there are still difficulties in its path. For now 4 patients have been recruited by the reference center. All of them have not grade ≤2 toxicity and present criteria for clinical and biochemical response in the initial test, maintaining their quality of life.

Conclusions: The lack of tradition of clinical studies with medical devices in our country, despite evidence of the benefit thereof difficult but does not prevent their development, so expect optimum recruitment to achieve the objectives.

BRACHIAL PLEXOPATHY AFTER STEREOTACTIC RADIOTHERAPY SBRT OF THE CHEST

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Introduction: Brachial plexopathy may occur in radiotherapy treatment of upper thorax.

Material and methods: We analyze two cases of men 88 and 81 years, with lesions in the upper lobe of the left lung who developed symptoms of brachial plexopathy after treatment with Stereotactic radiotherapy (SBRT). Both had been previously treated in the same location.

Results: Case 1: 1st radiotherapy: prescribed dose: 51 Gy, 3 Gy/fraction. Brachial plexus Mean Dose: 18.92 Gy; Maximum Dose: 29.58 Gy. SBRT: prescribed dose: 30 Gy, 15 Gy/fraction. Brachial plexus Mean Dose: 11.83 Gy; Maximum Dose: 25.42 Gy. Case 2: -1st radiotherapy: prescribed dose: 42 Gy, 6 Gy/fraction. Brachial plexus Mean Dose: 22.68 Gy; Maximum Dose: 45 Gy. SBRT: prescribed dose: 24 Gy, 12 Gy/fraction. Brachial plexus Mean Dose: 19.97 Gy; Maximum Dose: 24.23 Gy. After four months of SBRT, both patients had pain in periscapular deltoid region ipsilateral to radiation treatment (CTCAE grade 1 brachial plexopathy). No functional impairment was assessed.

Conclusion: The analyzed maximum dose (Dmax) of the two treatments approached the high risk limit in other studies: 24-26 Gy. Brachial plexopathy is a side effect to consider in cases of SBRT of lung upper lobe. Design of this structure for planning should be done as accurately as possible. The parameter Dmax or mean dose (Dmean) can be the indication to set tolerance, taking into account these parameters in cases of previous treatments in the same area.

IMAGE-GUIDED SBRT-VMAT IN ADRENAL METASTASES: INITIAL OUTCOMES

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Purpose: To report dosimetric parameters, acute toxicity and metabolic response of patients undergoing Stereotactic Body Radiation Therapy (SBRT) with Volumetric Arc Therapy (VMAT) for metastases to the adrenal gland.

Material and methods: From April to December of 2014, six patients were treated with SBRT-VMAT for limited metastases in adrenal gland. Primary sites were lung in five patients and colon in one. The prescribed dose was 45 Gy in 6 fractions. An internal target volume (ITV) was generated based on 4D-CT. The planning target volume was created by adding 3 mm to the ITV. At least 98% of the PTV receives 98% of the prescribed dose. IGRT was made with daily Cone-Beam CT. For kidneys, the general planning objective was V15 Gy<35% and for the liver V15 Gy<700 cm^3. Treatment was delivered in alternate days. Treatment's time was around ten minutes.

Results: The median gross tumor volume was 20 cm^3. From dosimetric point of view, plan fulfilled our dose constrains. No patients developed acute hepatic, renal or gastrointestinal toxicity according to the RTOG toxicity criteria. At the time of analysis, four patients have follow-up PET-scan 3 months after SBRT. It showed metabolic response in all cases.

Conclusion: SBRT-VMAT for adrenal metastases represents a safe and well tolerated treatment. It achieves highly conformal dose distributions. Further follow up is required to asses local control and late toxicity.

IMPLICATIONS FOR POSITIONING OF INTER-FRACTION INTRA-THORACIC ANATOMICAL CHANGES DURING SBRT

Martos, A.; Herrero, C.; Fueyo, M.; Méndez, L.; Santín, P.; Alonso, D.; Palizas, S.; Ríos, A.; Vilches, M.; Cabanillas, R.

Purpose: To determine the intra-thoracic anatomical changes (ITAC'S) during lung stereotactic body radiotherapy (SBRT) and to evaluate their implications on daily image guided radiotherapy (IGRT).

Methods and materials: 24 patients with 28 lesions of primary lung carcinomas or lung metastasis, treated between 2012 and 2015 in our center with SBRT from 3 to 8 fractions (50-60 Gy), were retrospective analyzed. The patients were initially positioned in customized immobilization cradles and then aligned with ExacTrac X-ray 6D (ET6D) and Cone-BeamCT (CBCT). 144 CBCTs were examined to define the ITACs experienced during the course of the treatment. On a second step, 106 CBCTs were retrospectively evaluated in order to compare the differences between soft-tissue target registration and bony anatomy matching for each translational dimension.

Results: In 10 patients (41%) 13 ITACs were identified. Types of observed ITAC'S were tumor regression (23%), changes in atelectasis (38%), tumor progression/edema (30%), and infiltrative changes (0.1%). Pleural effusion was not found. After positioning with ET6D and soft-tissue registration with CBCT, in 63 sessions the GTV was well inside the PTV, without position modifications (the translational setup discrepancies were 1.1 mm, 1.4 mm, 1.1 mm for vertical, longitudinal and lateral axis respectively). In 43 sessions it was necessary to change the position (displacement mean was 3.9 mm vertical, 3.6 mm longitudinal and 2.6 mm lateral).

Conclusions: ITACs during SBRT are less frequent than those reported during conventionally fractionated radiotherapy. The impact of these changes may be clinically irrelevant for the positioning with soft-tissue registration. A larger sample is needed to validate these data.

INITIAL EXPERIENCE TREATING SPINAL TUMORS WITH ROBOTIC SBRT

García, R.; Marrone, I.; Santa-Olalla, I.; Velazquez-Pacheco, A.

Objectives: The aim of this study is to analyze our preliminary experience treating spinal tumours using SBRT with a robotic linac system.

Material and method: We reviewed clinical and dosimetric data of 45 lesions and 30 patients (14 men, 16 women) with an average age of 44 years, treated from August 2011 up to January 2015. Twenty-two patients had malignant lesions and 8 were benign pathology. Thirteen were primary and 17 were metastatic lesions. Nine lesions were intramedullary and 6 intradural. Karnosfsky´s Index was <80 in 7 cases. The median total dose was 20 Gy (range, 10-35 Gy) delivered within a median of 3 fractions (range, 1-5 fractions) and median prescription isodose was 82% (77-88%).

Results: The median follow-up was 19 months (range, 3-41 months) and, at the time of the last follow-up, response rates were as follow: complete response in 10 lesions and partial response/stable disease in 17. The most common symptom was fatigue and no vertebral fractures have been found.

Conclusions: Treating spinal tumors with SBRT have shown to be a good alternative to conventional techniques, even though the debate is still open. In our experience, our data are encouraging and are comparable with the described by other authors.

IS STEREOTACTIC ABLATIVE RADIOTHERAPY A SAFE TREATMENT FOR INOPERABLE PATIENTS WITH MALIGNANT LUNG NODULES?

Veiras Lens, M.; Fandiño, J.M.; Díaz, I.; Soto, M.; Candal, A.; Izquierdo, P.; Triana, G.; Gesto, C.; Poncet, M.; Mariño, A.

Purpose: Treatment for lung nodules is mainly surgical but many patients are rejected for surgery because of age, concurrent pathologies or lung function. Stereotactic ablative radiotherapy (SABR) has emerged as a treatment option for early stage non-small cell lung cancer (NSCLC) and metastasis in patients unfit for surgery. The purpose of this review is to evaluate toxicity after SABR.

Material and methods: Between august 2012 and january 2015, 34 patients (36 CTV) previously rejected for surgery, were treated with SABR to a total dose of 60 Gy in 3, 5 or 8 fractions, depending on tumor size and location. - 32 lung cancer, 2 metastasis. Malignant histology: 18; ^{18}FDG PET positive: 11, suggestive CT scan: 5. SABR technique: No external rigid immobilization (arm and knee support); no active motion management or respiratory gating; CBCT before and after each SABR fraction; RapidArcTM; 2-3 fractions/week; dose prescribed to 80-90 isodose (95% PTV covered if possible). CTV between 1.2-125 cm^3 (media 22.75 cm^3). Patients typically had post-treatment follow-up visits and CT scans every 4-5 months after SABR. Toxicity (CTCAE v4.03) were retrospectively scored.

Results: 32 patients with a median follow-up of 7 months (range 28-1 months). 2 patients died before follow up (1 esophageal perforation scored as grade 5 toxicity and 1 no tumor-related death). No other > grade 2 toxicity recorded. 2 patients grade 2 atelectasis, 2 patients grade 2 cough and 1 patient grade 2 pneumonitis. Local control documented in 26 patients (81.25%). 4 patients do not have CT scan performed yet.

Conclusions: Risk-adapted SABR schedule is feasible for treating malignant lung nodules in patients not suitable for surgery. Early experience suggests that toxicity is low and local control is good. Longer follow-up will help to define local control, survival and cause of death.

LOCAL CONTROL WITH SBRT EXTRA-PULMONARY OLIGOMETASTATIC DISEASE: A SINGLE-CENTER EXPERIENCE

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Purpose: Retrospective analysis about Extra-Pulmonary SBRT oligometastatic disease in our center.

Methods and material: Twenty nine patients (36 lesions) were treated with SBRT; 19 bone metastases, 10 isolated lymph nodes, 4 liver metastases and 3 adrenal metastases. Doses range from 24 to 60 Gy depending of anatomical site and the volume of the lesions irradiated. Bone lesions were treated in 3 fractions with total dose of 24-27 Gy. The liver patients received 60 Gy in 3 fractions. The isolated lymph nodes were irradiated in 6 fractions with dose of 45 Gy, and adrenal metastases were treated in 3 fractions with a total dose of 36 Gy. Inclusion criteria was primary control, PS (0-1) and oligometastases status (<3 lesions). The treatment was planned in stereotactic conditions that include: abdominal compression, supine position, 4D-CT (some patients). Fiducials markers were implanted in the liver lesions through ultrasonogram. All patients were treated with FFF in TrueBeam-Linac. IGRT was established by CBCT pre and post every treatment.

Results: All patients completed the treatment. Median follow-up was 9 months (1-27). Local control was achieved in 100% of liver and adrenal lesions, 90% in lymph node metastasis (1/10 with bone invasion) and 79% of bone lesions (3 vertebra treated with 24 Gy and 1 femur metastasis with 27 Gy). Acute gastrointestinal toxicity were established as G1 (2 patients) and G2 (2 patients). No other toxicities.

Conclusions: This analysis shows a good outcome (local control and acute toxicity) with the use of SBRT as an alternative treatment in the control of oligometastatic disease.

LONG SURVIVAL IN PATIENT WITH LIVER METASTASES TREATED WITH SBRT

Begara, J.; Moreno, P.; Fernández, C.; Velasco, J.; Gongora, F.; Lopez, M.D.; Recio, F.J.; Martin, L.; Montenegro, N.; Rios, B.

Objetives: Describe the feasibility and efficacy of hypofractionated stereotactic body radiation therapy (SBRT) for treat four metachronous liver metastases in the same patient.

Methods and materials: A 68 year male patient was diagnosed in 2009 a colon adenocarcinoma with liver metastasis. After left colectomy received systemic chemotherapy with FOLFOX in 2009. After a complete response the patient had four metachronous hepatic metastases. He didn't wish QT and we offered SBRT for all four metastasis. Before each SBRT, he was evaluated and he had a CHILD-PUGH score A liver function. We use a custom made vacuum with abdominal compression. A contrast enhanced CT-scan and FDG-PET with image fusion was used for delimitation of CTV. A margin around the CTV of 5 mm was added to form PTV. Four treatment 3-6 cm maximum diameter: 1) Right subcostal (march 2011). 2) Left hepatic segment V (september 2012). 3) Metastasis VIII segment (January 2014). 4) Metastasis IV segment (august 2014). Constraints: Liver: >700 ml of normal liver <15 Gy, mean normal liver dose <20 Gy. Small bowel and stomach: Dmáx 30 Gy. Kidneys V15 <35%. Spinal cord Dmáx less 18 Gy. A total doses of 60 Gy in 8-10 fractions was delivered with VMAT and IGRT in 3 cases and one with DART (Dynamic arcotherapy radiation).

Results: After 48 months the patient is alive, aymptomatic, with normal liver function and local control.

Conclusion: SBRT in selected oligometastasic patients achieved good local control and prolonged survival without important toxicities.

LUNG CANCER TREATED WITH STEREOTACTIC BODY RADIATION THERAPY. CASE REPORT

Garcia Anaya, M.J.; Zapata Martínez, I.; Garcia Rios, I.; Ordoñez Marmolejo, R.; Perez Rozas, A.; Otero Romero, A.; Román Jobacho, A.; Toledo Serrano, M.D.; Correa Generoso, R.; Medina Carmona, J.A.

Personal history: A former smoker of 40 packs/year since 2005 with a history of hypertension and chronic obstructive pulmonary disease. In September 2013 the patient consulted to emergency room for fever, cough and haemoptysis.

Additional tests: CT Thorax: Round lesion measuring 2.5 cm, with internal calcifications in left hilar situation, which causes obstruction of the bronchus of the upper lobe and lingual.

Bronchoscope: Infiltrating squamous cell carcinoma, moderately differentiated.

Positron Emission Tomography: A left parahiliar hypermetabolic spot of 27 mm compatible with primary lung neoplasm:

- Diagnoses: Lung cancer T1N0M0.
- Therapeutic decision: fractionated stereotactic body radiotherapy.
- GTV: left parahiliar hypermetabolic lesion.
- CTV=GTV.
- ITV: the target volume at each phase of the respiratory cycle.
- PTV: ITV + 5 mm.

Dose of 50 Gy in 5 fractions 3 times/week, prescribed to the isodose covering a minimum of 95% of the PTV. Daily position verification with Elekta 4D cone beam CT (XVI).

Final comments: A mediastinal displacement of 2.5 cm was observed by the 4th treatment fraction with a decrease in lung volume although no underlying lung atelectasia. Errors in positioning parameters were excluded with XVI. Given these findings we opted for a new CT scan and treatment planning. Current CT showed a volume loss of the left hemithorax as compare to previous. The reason for the originary hyperinsuflation was a valve mechanism exerted by tumour compression. Tumor response to radiotherapy unblocked the main bronchus resulted in a lung volume normalization. At the present the patient is alive without disease.

LUNG STEREOTACTIC BODY RADIATION THERAPY IN THE ELDERLY

Larrea, L.; López, E.; Antonini, P.; González, V.; Baños, M.C.; Bea, J.

Purpose and objectives: To evaluate stereotactic body radiation therapy (SBRT) for primary or oligometastatic lung tumors in patients over 75 years old.

Materials and methods: Between 2002 and 2014, 70 elderly patients with 81 lung tumors (70% primary and 30% metastatic) were treated using SBRT. SBRT involved: Computed tomography (CT) simulation with immobilization devices, contouring the target volume in 3 sets of CTs, superimposing the volumes in the planning system to represent the internal target volume

and dose calculation using heterogeneity correction. Radiation delivery with multiple static non-coplanar beams and arc therapy assured conformal dose distribution and steep fall-off of the radiation. The prescribed dose was 3 fractions of 14-16 Gy each or a single 30-Gy fraction. Dosimetric constraints were set for surrounding organs at risk. Toxicity and radiologic response were assessed in follow-up visits, using standardized criteria and analyzed retrospectively. Survival rates and toxicities were calculated by the Kaplan-Meier method.

Results: Median patient age was 79 years (75-89). Mean tumor volume was 5.2 cm^3 (0.6-292.7). Transient grade 1 or 2 acute toxicities occurred in 12.3% of all cases. No grade >3 acute or any chronic toxicities were identified. The median follow-up was 19 months (3-65). The 1-year overall survival was 88.8% (91% primary and 83% metastatic). Local control in the irradiated volume is 98.7%.

Conclusions: SBRT is an excellent treatment option for lung tumors in elderly patients. Our encouraging results are in line with those reported in recent literature for younger patients.

OUTCOMES AFTER SBRT WITH CURATIVE INTENT IN DIFFERENT PATTERNS OF OLIGOMETASTASIC DISEASE

Beato Tortajada, I.; Conde Moreno, A.; Muelas Soria, R.; Sanchez Iglesias, A.L.; García Mollà, R.; Bouché Babiloni, A.; Francés Muñoz, A.; Morillo Macías, V.; Rodríguez Cordón, M.; Ferrer Albiach, C.

Purpose: Determine the impact of treatment with SBRT with curative intent in the evolution of the disease in different patterns of oligometastasic disease treated in our center.

Methods: Between 2008/2014, 39 patients with less than 5 metastasic lesions and primary controlled were enrolled on prospective studies of SBRT for oligometastases patients. All available records were retrospectively study. Median age was 62 years. Oligorrecurrents 17 (44%) and oligoprogression 22 (56%). Doses administered: 21 Gy in 3 fx to 60 in 5 fx. Toxicity was reported with the CTCAE.4 scale by site.

Results: With a median follow-up of 43 months (2-84), results in terms of local control after treatment of metastases were 87% and 18 patients (46%) distance progression treated with chemotherapy. Oligorrecurrents patients: all with local control metastases but 1 exitus secundary quimiotherapy after liver progression. Oligoprogression patients: 5 patients (11%) local progression. 5 patients (11%) distance progresson treated with chemotherapy and 12 (54%) patients stable diseaese. 3 exitus at the time of study: all with distance progression and treated lesion controled. Toxicity reported in all the patients was less than G2 in CTCAE.4 scale by site. 1 patient with vertebral fracture with controled pain. No more chronic toxicity was reported.

Conclusions: SBRT is a good option in oligometastases patients, and, perhaps may yield prolonged survival in oligorrecurrents patients, cure or slow the progression of the disease in selected patients.

PRIMARY LUNG TUMOR: TREATMENT WITH IMAGE-GUIDED SBRT-VMAT

Gómez Aparicio, M.A.; Escolar Perez, P.P.; Iglesias Agüera, A.; Salinas Ramos, J.

Purpose: To report the local control and toxicity of Stereotactic Body Radiation Therapy (SBRT) with Volumetric Arc Therapy (VMAT) for stage I Non small cell lung cancer (NSCLS).

Material and methods: Thirty-five patients with stage I NSCLS tumors were treated, between April 2012 and August 2014, with SBRT, using VMAT and IGRT. IGRT was made with daily Cone-Beam CT. An internal target volume (ITV) was generated based on 4D-CT. The planning target volume was created by adding 3 mm to the ITV. At least 98% of the PTV receives 98% of the prescribed dose. Treatment was delivered in alternate days; for central tumors to a dose of 60 Gy in 8 fractions; for peripheral tumors 55 Gy or 54 Gy in 5 or 3 fractions respectively.

Results: Median age was 72 years (range 51-82 years). Karnosky Performance Status was 80-100% in all cases. There were T1 in 19 patients and T2 in 16 patients. Treatment's time was around ten minutes. Only one patient had esophagitis grade 1. The patients who experienced worsening dyspnea had pulmonary disease prior to the treatment. One patient had rib fracture. At the time of analysis, 28 patients are alive and 7 dead. Local control was 90% and 88% en T1 and T2 respectively. Median follow up was 19.4 months (range 4-31.5 months).

Conclusions: VMAT is an efficient treatment technique for SBRT in primary lung tumors, achieving similar local control and toxicity rates as other techniques.

PROSTATE RADIOSURGERY DOSIMETRY COMPARISON FOR DIFFERENT RECTAL BALLOON FILLING MATERIALS

Santa-Olalla Carcedo, I.; García García, R.

Objectives: To report the dosimetry differences in robotic radiosurgery prostate plans when using 2 different rectal balloon filling materials.

Methods: Low risk prostate cancer stereotactic body radiotherapy (SBRT) is appearing as a promising treatment option. Accuracy on delivering the treatment could be challenging due to the well known prostate motion. In order to minimize that motion it is well established the use of a rectal balloon during patient simulation and treatment. Quite often the balloon is filled with air. We filled the rectal balloon with saline solution and deliver the SBRT treatment by using a Robotic Radiosurgery device. We described the dosimetry differences in 7 prostate patients´ plans when changing the electron density value of the rectal balloon filling from saline value to air value.

Results: We have found no significant differences between coverage for GTV and PTV (the average coverage difference air to saline is 0.000% and 0.174% for GTV and PTV, respectively) as well as no significant differences in Dmin, Dmax and Dmean for bladder and urethra (0.017%, 0.001%, –0.001% and 0.018%, 0.000%, –0.007% for bladder and urethra, respectively). We found very discrete differences in Dmin and Dmax for rectum (1.771% and 0.452%, respectively) and differences slightly significatives in the rectum mean dose (4.085%).

Conclusions: In the case of prostate robotic radiosurgery, it seems there are no significative dosimetry differences when using a rectal balloon filled with saline solution compared to one filled with air.

PULMONARY FUNCTION IMPACT AT 36 MONTHS OF SBRT IN NSCLC

Navarro, A.; Arnaiz, M.M.; Aso, S.; Bavestrello, P.; De Blas, R.; Navarro, V.; Guedea, F.

Purpose: To evaluate pulmonary function, local control overall survival cáncer specific survival and disease free survival at 36 months of SBRT in a phase II trial for inoperable NSCLC stage I-II.

Material and methods: 38 patients diagnosed with NSCLC were enrolled in a phase II SBRT trial between 2008 and 2012. Locations were: upper lobes in 27p, inferior lobes in 10p and 1 in

middle lobe. Histollogies were: adenocarcinoma 15p, squamous carcinoma 12p, CPNCP (non small cell lung cancer) 10p. Dose delivered was 54 Gy (18 Gy×3fr). Pulmonary function test (PFT) was recorded previous treatment and every six months after treatment and repeated measures analysis model with AR(1) correlation matrix were performed.. Gender: men 94.7% (n=36), women 5,26% (n=2), mean age 74y (52-89). Comorbilities 31% of patients presented two or more. 40% of patients presented GOLD III or IV. Kaplan-Meyer estimation were obtained for survival estimations.

Results: After 36 months of follow up any impairment in PFT was detected, 38% of patients presenting GOLD III or IV as at the beginning of the treatment. Local control was 93% (83.4-99.3), overall survival 60.5%, cáncer specific survival was 76.9% and disease free survival was 77.5% (62-87). Acute and chronic toxicity was 5.2% respectively.

Conclusion: These results support this technique as a safe treatment for this fragile population and the fact that there are no limits in PFT to treat them.

QUALITY OF LIFE AFTER PHASE II SBRT FOR PROSTATE CANCER

Macias Hernandez, V.; Blanco Villar, M. L.; Fernandez Gomez, M.J.; Soria Carreras, P.; Alonso Rodriguez, O.; Cigarral Garcia, C.; Matskov, K.; Nieto Palacios, A.; Rodriguez Gutierrez, A.; Perez Romasanta, L.A.

Rationale: Phase II trials suggest delivering high dose in 4-5 fractions over 1 week to selected low-intermediate risk prostate cancer patients (PCP) using Cyberknife is safe. There is little information about slight protracted schemes (2-3 weeks), or in high-risk patients, or using non-robotic linacs.

Purpose: To evaluate toxicity and quality-of-life (QOL) outcomes among low-intermediate-high PCP after a 2.5-week course of helical tomotherapy.

Material and methods: Exclusion criteria were cT3b-4, Gleason 9-10, PSA>40, IPSS>20 or previous urinary obstruction. SBRT delivered 45.2 Gy in 8 fractions (ED1.5=92 Gy) in 64 patients. Data from the EPIC and IPSS questionnaires, along with CTC toxicity were obtained at baseline, last fraction (IPSS only), 1-month after treatment and every 6 months thereafter.

Results: Median follow-up was 13.4 months (2.2-32.7). There were no Grade 3+ acute or late urinary/rectal complications. Grade 2 urinary/rectal toxicities were observed in 20.3/15.6% during SBRT, 4.8/0% at 1-month, and 8.7/4.3% at 12-month follow-up (archive 1). Urinary and bowel QOL scores initially worsened, but later returned to baseline values at 6 months. Baseline IPSS (mean±SD) was 6.38±4.27, increased to 12.72±7.45 at the time of the last fraction, returning to baseline at 6 months (6.30±4.98) (archive 2). No patient had biochemical failure at last follow-up.

Conclusions: Interim results show that this SBRT scheme was well tolerated and so far the impact on QOL was small. Toxicity rates were comparable to conventionally fractionated radiation therapy or brachytherapy. (Detailed and updated outcomes will be presented).

REIRRADIATION (RRT) IN DIFFERENT LOCATIONS

López Ramírez, E.; Arregui Castillo, G.; Rivas Sánchez, D.; Lazo Prados, A.; Gómez Oliveros, J.; Sacchetti Fernandes de Passos, A.

Objectives: Reirradiation (RRT) is a treatment option for patients who have small relapse and who have no other salvage options. Depending on the location of the tumour, the RRT can be planned with 3DCRT, brachytherapy, radiosurgery, Intense Modulated Radiotherapy (IMRT) and Stereotactic Body Radiotherapy (SBRT). RRT can produce more late adverse effects (20-40%) depending on the initial dose of RT, the location of the primary, the retreatment doses, the treatment volume and the technique. Our goal was to communicate the feasibility and effectiveness of RRT in different locations with new RT techniques.

Patient and methods: Between July 2010 and February 2015 we have reirradiated a total of 29 patients from different tumours. The most frequent were breast, brain and head and neck cancer. All the RRT were performed with hypofraccionated IMRT/VMAT techniques or SBRT (<8 sessions) and a Elekta Synergy® LINAC.

Results: With a mean follow up of 25 months, 21 patients are alive and their disease was controlled (72.4%). The cause of death was local progression in 3/8 patients (37.5%). There has been no acute or late toxicity in any patient. RRT needs proper selection of patients including radical or palliative treatment. Another factor to consider is the previously radiation dose received by critical organs. The availability of modern RT techniques will increase RRT options because they can deliver higher doses with greater safety. There is no uniformity in the therapeutic approach and RRT is a highly personalized radiotherapy.

Conclusions: The RRT is a potential for selected patients who otherwise may not have a salvage treatment opportunity.

RELATION BETWEEN TUMOUR MOTION AND PLANNING TECHNIQUE IN LUNG CANCER SBRT

Rico Oses, M.; Errasti Viader, M.; Navarrete Solano, P.A.; Barrado Los Arcos, M.; Campos Vargas, M.; Visus Fernández de Manzanos, I.; Villafranca Iturre, E.: Pellejero Pellejero, S.; Martínez López, E.

Purpose: Prolonged delivery times during cone-beam computed tomography (CBCT)-guided lung stereotactic body radiotherapy (SBRT) could affect the intrafraction variation (IFV). In this study we analyze if different SBRT techniques influence in the treatment time (TT) and, indirectly, in the IFV.

Material and methods: 103 fractions delivered between 2011 and 2014 were analyzed. All patients had a 4D-CT with Body-Fix™ to create the ITV. A 5 mm margin was applied for the PTV. IFV was measured as the difference between post-correction-CBCT and post-treatment-CBCT. TT was the time between pre-treatment-CBCT and post-treatment-CBCT. We studied the relationship between different planning techniques (arc therapy (AT), fixed fields (FF) or the combination of arcs and fields (AF)) and TT, and if it consequently affected to the IFV.

Results: Mean IFV was 1±1.16 mm, 1.29±1.38 mm, and 1.17±1.08 mm in the x, y and z axes, and the vector was 2.43±1.58 mm; 99 fractions (96.1%) had displacements below 5 mm. Mean TT was 15.30±6.82 min, 17.79±3.52 min and 24.76±5.4 min for AA, AF and FF respectively ($p<0.05$). There were no significative differences in IFV among AA, AF and FF. IFV was greater in older patients ($p=0.019$), with low DLCO ($p=0.041$) and in left side lesions ($p=0.009$).

Conclusions: No differences in IFV have been seen between different SBRT techniques with our immobilization system. Age, DLCO and localization are factors that could affect the IFV and should be studied in depth. The 5 mm margin for the PTV is enough to encompass our IFV.

RELATION BETWEEN TUMOUR MOTION AND PLANNING TECHNIQUE IN LUNG CANCER SBRT

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Conclusions: No differences in IFV have been seen between different SBRT techniques with our immobilization system. Age, DLCO and localization are factors that could affect the IFV and should be studied in depth. The 5 mm margin for the PTV is enough to encompass our IFV.

SBRT DELAYS THE EMERGENCE OF CASTRATION-RESISTANCE IN OLIGOMETASTATIC PROSTATE CANCER

Martínez Fernández, M.I.; Martínez Monge, R.

Purpose: To evaluate if metastases-directed stereotactic body radiation therapy (SBRT) can delay the progression to a castration-resistant prostate cancer (CRPC) of patients with oligometastatic prostate cancer (OPC) that present biochemical failure during androgen deprivation therapy (ADT).

Methods and material: OPC is usually managed with ADT. Progression to CRPC will inevitably occur in the majority of these patients. There are several strategies aimed to delay the emergence of castration resistance including intermittent ADT, second generation antiandrogens (abiraterone, enzalutamide) or metastases-directed SBRT. The present report describes two cases of patients with OPC that received SBRT 24 Gy/3 Rx to the solitary bony lesion after ADT failure.

Results: Both patients experienced complete and durable biochemical response for 13 and 17 months, respectively.

Conclusions: SBRT to solitary bony lesions can be used to delay the emergence of castration resistance and the need for systemic therapy when used after ADT failure.

SBRT FOR LUNG CANCER AND METASTASES: CLINICAL OUTCOME OF 61 CASES

Roman Jobacho, A.; Perez Rozos, A.; Otero Romero, A.; Jerez Sainz, I.; Zapata Martinez, I.; Garcia Anaya, M.J.; Castillo Montiel, F.; Gomez-Millan Barranchina, J.; Medina Carmona, J.A.

Stereotactic body radiation therapy (SBRT) is a potentially effective alternative treatment modality that involves the delivery of very high individual doses of radiation to tumors in various extracranial sites with high precision, phase I and II trials of SBRT for various primary tumors and oligometastase have demonstrated feasibility, safety, and efficacy with good to excellent local. Purpose of this study was to evaluate efficacy and tolerability of SBRT in a cohort of patients treated at our institution.

Material and methods: 61 patients with stage I, non small cell lung cancer or isolated single lung metastasis considered medically inoperable were treated from August 2011 to January 2015. Mobility was reduced by abdominal pressure. Determination of respiratory motion was based on an additional 4-dimensional CT scans and a 4D-IGRT protocol (Symmetry) installed on an Elekta Synergy accelerator with on-line correction of target position errors. The prescription dose was 18 Gy×3 fractions for peripherally lesions and 10 Gy×5 fractions for centrally lesions.

Results: Median age was 73 years (43-85), there were 49 men and 12 women. Tumor size ranged from 0.60 to 6 cm and median follow-up was 20.21 months. There were no>2 grade and only 3 patient developed grade 2 toxicity. 93% of patients achieved local control. At follow-up completion, 8 patients had died. The causes of death were distant progression (n=4), other diseases (n=4). We treated 43 primary non-small cell lung cancer and 18 isolated single lung metastases, the 3-year overall survival rates were 83% and 71%, respectively.

Conclusions: SBRT is a feasible,safe,and effective procedure. It promises high local control with a reduced overall treatment time.Excellent rates of local control and OS have been demonstrated.

SBRT: EXPERIENCE WITH MULTI-TREATED PATIENTS

Hernandez Machancoses, A.; Almendros Blanco, P.; Garcia Hernandez, T.; Pastor Peidro, J.; Vicedo Gonzalez, A.; Granero Cabañero, D.; Garcia Miragall, E.; Lopez Torrecilla, J.

Introduction: Stereotactic body radiotherapy (SBRT) is a treatment technique that is gaining a role in the treatment of oligometastaticdisease. In our service we have made since we implemented the technique 96 treatments. Of these, 42 were performed on 15 patients (p) in different locations.

Methods: Since2012 wehave performed 96 treatments, of which 42 were performed in 15 patients; 1 patient/5 treatments, 3 patients/4 treatments, 3 patients/3 treatmentst and 8 patients/2 treatments each. PET/CTis performed on livermetastases/CTgating the rest; we outline the phases of gating and fuses with the primary planning CT which have been outlined other structures. It´s calculated PINNACLE-system and treat linear-accelerator VARIANConebeam prior to treatment for positioning and subsequent verification to check the intrafraction motion, with 6MVphotons. Treatment: various schemes are used in a range between 600-2000 cGy/36-60 Gy fraction and dose according to the metastatic site: lymphnode 36 Gy/600 cGy/fraction; phrenicpulmonary cost 800 cGy/fraction; and the adrenals, liver and lung rest dose ranges from 36-60 Gy/1200-2000 cGy/fraction.

Results: We emphasize only acute toxicity (RTOG) astenia G1-2. Survival: all treaties 1died due to disease progression, 6are alive with disease and 8are free of disease.

Conclusion: SBRT is a technique that offers a possibility oligometastásic-treatment patients with good control of the disease, and the total acceptable toxicity shortening of treatment time. This technique allows to treat patients at the time where a new metastases which can offer free during periods of illness a good quality of life is detected.

STEREOTACTIC BODY RADIATION THERAPY (SBRT) IN LUNG CANCER LESIONS

Candini, D.; Vallejo, M.C.; Hernanz, R.; Moris, R.; Ramos, A.

Objetives: To report experience treating lung cancer by SBRT in our institution.

Materials and methods: We report data of 54p with stage IA-IB non-small cell lung cancer, treated between January-2011 and September-2014 by SBRT. PET/CT was carried out for staging. The immobilization system used was dampening. SBRT was performed with three different schedules, depending on the size and location of the tumour: 3 fx 20 Gy, 5 fx 12 Gy and 8 fx 5 Gy. Daily control with cone-beam-CT was used.

Results: Mean age was 72.57 (54-86) years, 49-men (90.7%) and 5-women (9.3%). 51 (94.4%) were inoperable and 3 (5.6%) refused surgery. Histology diagnosis in 37p (68.6%): 21-adenocarcinoma (56.75%), 15-squamous cell carcinoma (40.54%), 1-NSCLC. Tumour location: central in 9 patients (16.7%), medium in 24 (44.4%) and peripheral in 21 (38.9%). Tumour size (9-42 mm): 26p T1a (48.1%), 23p T1b (42.6%), 5p T2a (9.3%). 5p (9.3%) were treated with 3 fx 20 Gy; 23p (42.6%) with 5 fx 12 Gy and 26 (48.1%) received 8 fx 7.5 Gy. Acute and subacute side effects were mild: rib asymptomatic fracture in 1p (1.9%), and grade 2 local dermatitis in 3p (5.6%). The median follow-up was 36.9 months. Local control was 87.03%. Distant metastases were seen in 6p (11.94%), 3 of them with local control. Only in 3p (5.55%) tumour was the cause of death. Overall survival rates were 83.3%.

Conclusions: SBRT can be performed in an easy and comfortable way. Using an adapted dose schedule, SBRT is a well-tolerated treatment and it leads to a favourable tumour control.

STEREOTACTIC BODY RADIATION THERAPY (SBRT). OUTCOMES AND TOXICITIES

Diaz Gavela, A.A.; del Cerro Peñalver, E.; Marcos Jiménez, F.; Couñago Lorenzo, F.; Castro Novais, J.; Maldonado Suárez, A.

Objetive and purposes: SBRT is an increasingly common noninvasive technique of giving high doses of radiation to tumor deposits in extracranial locations. The objective of our study is to show our results in terms of toxicity and local response.

Methods and materials: Between May 2012 to January 2015, 63 patients (92 lesions) with body metastases or primaries of varying histologies were treated with SBRT. We evaluated acute (3months) toxicities as well as the response of the treated lesions.

Results: The median age of patients were 62 years (26-87) and the median follow-up was 8 months (2-34). The most common histology was non-small cell lung cancer and the most frequent localizations of the treated lesions were lung (both metastases and primary), bone, adrenal and lymph node metastases. Administered dose and fractionation varied significantly depending on the size and location of each lesion and its anatomic relationship with adjacent organs at risk, ranging from one to ten fractions and 8 to 60 Gy. The median volume of the PTV was 51.76 cc (3.11-259.08 cc). A complete local response was achieved in 33.7% of patients and we observed a 9.8% of pseudoprogressions. There were no grade 3-4 toxicities. Acutely, the most frequent toxicities were fatigue and bone flair. Chronically, the most frequent was bone pain (3.3%).

Conclusions: SBRT is a feasible and well tolerated treatment for extracranial metastases. Longer follow-up is necessary to assess whether the local response is maintained over time and the influence of the treatment in overall survival.

STEREOTACTIC BODY RADIATION THERAPY (SBRT): EXPERIENCE IN OUR DEPARTMENT

Fernández Fornos, L.; Miranda Labajos, S.; Espósito, R.D.; Pomares Arias, A.; Dorado Rodríguez, P.; Ruiz Sánchez, M.; Planes Meseguer, D.; García Miragall, E.

Purpose: We present our experience in treatment of primary and metastatic tumors with SBRT.

Material and methods: Between April 2012 and January 2015, 63 patients with 73 different locations underwent SBRT for primary and metastatic tumors using CT and/or PET-CT for diagnosis. Treatment planning was made using vacuum body fixation and abdominal compression to reduce intrafractional organ motion. We made five CTs planning in all patients: 3 free breathing, inhalation and exhalation. Internal target volume (ITV) was delineated based on fusion of five CTs. Planning target volume (PTV) was then determined by adding additional setup margin to ITV. The locations of treatments were distributed as follows: 21 primary lung tumors, 35 lung metastases/lung relapse, 8 lymph node metastases, 4 bone metastases, 3 adrenal metastases, and 2 liver metastases. We have made different fraction schemes based on the location.

Results: Tolerance during treatment has been excellent, appearing as acute toxicity, rib pain (G1-G2) in 4 patients, asthenia (G1) in 2 patients, dysphonia (G1-G2) in 2 patients and dysphagia (G1) in 1 patient. Assessment of response was performed with CT and/or PET-CT. With a median follow up of 12 months, the local control was 80% in a primary lung tumors, 66% in metastases/lung relapse, 85% in nodal metastases and 100% in bone, adrenal and liver metastases.

Conclusions: SBRT is an effective treatment in primary and metastatic tumors, with excellent clinical tolerance. In our series we obtain results similar to local control in the published series.

STEREOTACTIC BODY RADIATION THERAPY FOR MALIGNANT TUMORS OF THE PANCREAS

Chen, X.; Sanchez, E.; Hernando, O.; López, M.; Potdevin, G.; Payano, S.; Valero, J.; Ciérvide, R.; García-Aranda, M.; Rubio, C.

Purpose: To review stereotactic body radiation therapy (SBRT) safety and local control utility in malignant tumor of the pancreas based in a single center experience since February 2014.

Patients and methods: A systematic review was done. Nine patients were treated with SBRT (eight patients with primary pancreatic tumor and one patient with metastatic affectation of the pancreas). All of the treated tumors were bigger than 2 cm. At least 2 fiducials were located into the tumor, guided by endoscopic ultrasound. All the treatments included CT or PET-CT for GTV delineation, intensity-modulated radiation therapy (IMRT) and image-guided radiation therapy (IGRT) with intrafraction control of tumor motion with a Novalis Exactrac Adaptive Gating System. 50 Gy in 10 fractions were prescribed in eight patients and one patient was treated with 35 Gy in 5 fractions.

Results: Pancreatic SBRT was very well tolerated in our cohort of patients. At three months, CT evaluation of response showed local control in all the patients (9): stable disease (7) with RECIST criteria, and metabolic improvement (1) and metabolic complete response (1) in PET-CT. Four patients developed peritoneal progression disease despite a good local control (from 2 to 12 months after treatment).

Conclusions: In our experience, Gating SBRT for pancreatic tumor is a feasible treatment, well tolerated and with a good local control. However prospective studies are needed to defined the role of SBRT for pancreatic tumors.

STEREOTACTIC BODY RADIOTHERAPY (SBRT) IN OLIGOMETASTASES

López Ramírez, E.; Arregui Castillo, G.; Rivas Sánchez, D.; Lazo Prados, A.; Gómez Oliveros, J.; Sacchetti Fernandes de Passos, A.

Objectives: The term "oligometastases" indicates that the number and location of metastases are limited. Stereotactic Body Radiotherapy (SBRT), allow administering the tumour much larger biologically effective doses (BEDs 100 Gy or more).

Patients and methods: Between January 2010 and December 2014 we treated 54 highly selected oligometastatic patients. We performed 73 procedures and the treated lesions were 139. Locations included brain (44), lung (73), spine (8), lymph nodes (5), bone (3), adrenal glands (3), pancreas (1), and liver (2). SBRT was performed with IMRT/VMAT techniques with an Elekta Synergy® LINAC. The hypofractionation ranged from 3 sessions of 5.5 Gy (DBE=25.575 Gy) to 3 sesions of 20 Gy (DBE=180 Gy), depending on each clinical case. The majority of patients (25) were treated with 8 sessions of 7.5 Gy so the DBE median was 105 Gy.

Results: All patients were evaluated with alternatives CT and PET/CT every three months. With a mean follow up of 14.81 months, 20 patients died (37.7%) for tumour progression at different locations to those treated with SBRT, representing a 60% local control. Eight patients presented local progression (40%), six with brain progression (75%) and 2 with liver progression (25%). There was no acute or late toxicity in any patient. 13 patients (24.07%) live longer than two years.

Conclusions: SBRT may be a therapeutic alternative with low toxicity in a high proportion of patients with oligometastases that could be cured or have a long survival. SBRT enables to prescribe BEDs of 100 Gy or more, and possibly this is enough to explain the high cure rates.

STEREOTACTIC BODY RADIOTHERAPY (SBRT) SPINAL. REIRRADIATION: RADICAL TREATMENT?

Moreno, P.; Begara, J.; Fernández, C.; Jiménez, R.; Rios, B.; Nuño, C.; Gongora, F.; Velasco, J.; Recio, F.; Vallejo, A.

Objetives and purposes: Varon 46 years in June 2012 had kidney tumor and D10 vertebral metastases with spinal cord compression syndrome (SCM). SINS (Spine inestability neoplastic score) 7 (potentially unstable) derived orthopedic surgical stabilization is not possible (severe bleeding). Analyze dosimetric aspects of the three spinal SBRT patient applied since 2012.

Material and methods: CT-simulation (slice thickness), stereotactic body frame (ELEKTA®) mattress individualized and diaphragmatic compression. Image Fusion (CT/MRI). SYNERGY® multi-energy linear accelerator. Isocenter stereotactic localization (Dynatrac®). Robotic table (6 degrees of freedom-Hexapod®). Image-guided RT (IGRT) cone beam. 1st SBRT (July 2012). GTV: Lysis and soft tissue mass in D10 (38.6 cc). CTV: In a dorsal level and for the degree of involvement: body, pedicle, lamina and left transverse process (64.2 cc). PTV: CTV+2 mm (95.4 cc). IMRT-SS 10 beams, 97 segments. 5×6.25 Gy. 2nd SBRT (February 2014). GTV: Break right side of D10 (7.7 cc). PTV: GTV+2 mm (15.7 cc). VMAT-DA. 15×3 Gy. 3rd SBRT (January 2015). GTV: Lysis in D11 (4.8 cc). CTV: In a dorsal level and for the degree of involvement: body, right pedicle (17 cc). PTV30: CTV+2 mm (23.5 cc) PTV40: GTV+2 mm (7.4 cc). VMAT-SA IB. 10 sessions.

Results: The patient after nephrectomy and chemotherapy remains virtually asymptomatic.

Conclusions: SBRT has the potential to be used in place of surgery in high-risk situations as in our case. Reirradiations can prevent irreversible spinal cord injury with improvements in quality of life of patients.

STEREOTACTIC BODY RADIOTHERAPY IN SPINAL AND NON-SPINAL METASTASES

Navarro, A.; Leaman, O.; Lozano, A.; Pineiro, R.; Bavestrello, P.; Navarro, V.; De Blas, R.; García, E.

Purpose: To evaluate early toxicity and local control in 30 lesions treated with Stereotactic body radiotherapy (SBRT).

Material and methods: Thirty lesions were treated with SBRT. Doses were 16 Gy in a single fraction to 80% of the PTV in spine metastases in 20 lesions and 22.5 Gy in three fractions over 10 lesions. Spine metastases were treated using VMAT and non spine metastases with static fields trying to achieve conformality index equal to 1.2. All the treatments were performed using IGRT. Mean age 53,3 (r 36-67), primary tumor were colon in 6.9%, breast 62.1%, pancreas 3.4%, prostate 13,8%.Distribution of spine were: cervical 10% (n=2), dorsal 40% (n=8), lumbar 40% (n=8), sacrum 10% (n=2), non spine metastases were sternum 10% (n=1), femur 20% (n=2), pelvic área 70% (n=7). Progression free survival prior the treatment 30 months. Mean Eva score was 1.63. PSA and Ca 15.3 levels were registered in prostate and breast tumors.

Results: After mean follow up of 11 months (r 2-32) local control was 100% in the PTV. Acute toxicity was registered as a flair in 3 cases, no motor or nervous impairment were detected. No Chronic toxicity was detected. Progression free survival after treatment was 17.64 (r7,07-28.21). Overall survival at 12 months was 83.6%. PSA levels showed lower PSA at the end of the present study.

Conclusions: SBRT in bone metastases offers a good local control with a low toxicity profile. However further studies with more patients and longer follow up are needed.

STEREOTACTIC BODY RADIOTHERAPY OF PULMONARY LESIONS (SBRT). A SINGLE CENTER EXPERIENCE

Castillo-Martin, J.C.; Agramunt-Chaler, S.; Roselló-Serrano, A.; Buxó, M.; Anglada-Tort, L.; Auñon-Sanz, C.; Oliva-Poch, E.; Fuentes-Raspall, R.

Objectives and purpose: From May 2012 SBRT was implemented for lung lesions in our Service. We presents our initial experience and treatment results.

Material and methods: Between May 2012 and April 2014, 35 patients were treated. 25 (71%) primary tumours and 10 metastasic. All patients but one had surgical contraindication. 21 (60%) px were histologically proved and 10 (42%) had only PET and/or CT. Candidates were patients refusing surgery or not operable, lesions up to 50 mm (T2a) and extension study with PET/CT. The dose and dose per fraction were: 54 Gy (18 Gy # 3), 60 Gy (12 Gy # 5) and 60 Gy (7.5 Gy # 8).Treatment sequence was as follow: 4D CT simulation, dosimetric study, "Cone Beam" at the beginning of treatment and at each sessions. Dosimetric study was by multiple non coplanar fields of 6 MV (usually 7). Calculation was made by Acuros XB®. Rate of compliance was less than 1.2. Dose outside the PTV should be under 50% within 2 cm. Median follow-up of 13,6 months (between 2.19 to 45.6 months), 10 patients died from progressive disease. Median survival was 28.7 months. Toxicity was pneumonitis grade 2/3 in 1 px.

Conclusions: Implementation of SBRT has been a complex process. In our service we believe that these first 35 patients treated during 2 years has been enough for obtaining the learning curve required for performing the technique routinely.

STEREOTACTIC RADIOTHERAPY AS TREATMENT OF OLIGOMETASTATIC PROSTATE CANCER. MONOINSTITUTIONAL EXPERIENCE

Sobrón, M.; Pastor Peidro, J.R.; Juan Escudero, J.U.; Escudero, E.; Durán, A.; García, J.; Hernández Machancoses, A.; Cayuelas, C.; Marqués, E.; López Torrecilla, J.

Objective: To report our preliminary clinical experience regarding stereotactic radiotherapy (SBRT) as treatment of oligometastatic disease in patients with prostate cancer (CaP-O).

Method: We analyze a prospective cohort of 11 patients (23 lesions) with CaP-O treated with SBRT between October 2010 and November 2014. Treatment plans were designed using the Pinnacle (Philips) software with daily image guidance using TrueBeam linac. Treatment sites included bone (n=7) and lymph nodes (n=16). In each case fractionation schemes and doses prescribed per sesion were individualized. Response to treatment was assessed with PSA levels and imaging techniques (RECIST/PERCIST criteria) and toxicity was assessed with RTOG/EORTC score.

Results: The mean age was 66.6 years (SD±13.5) with a median follow up of 11.7 months (range 1.5-50.5). One patient was treated twice. All patients received primary treatment prior development of distant metastatic disease [Hormonetherapy (n=11), Radical Radiation Therapy (n=11), surgery (n=7), chemotherapy (n=1)]. During follow-up, 7 patients (63.6%) achieved a complete response, 4 patients (36.4%) achieved a stable disease, with no patient showing local progression. Only 2 patients (18.1%) show posterior progression out of treatment field. No acute or late toxicity (G0) was observed in any of the patients during all follow-up.

Conclusion: These preliminary results suggest that SBRT would be an effective treatment showing a safe profile for patients with prostate cancer and oligometastatic disease.

STEREOTACTIC RADIOTHERAPY IN PREVIOUSLY IRRADIATED THORAX. CLINICAL AND RADIOLOGICAL TOXICITY

Monroy Anton, J.L.; Jornet Fayos, J.; Soler Tortosa, M.; Lopez Muñoz, M.; Navarro Bergada, A.V.; Estornell Gualde, M.A.

Introduction: Stereotactic Radiotherapy (SBRT) could be a chance for patients with local relapse of thoracic neoplasms. Toxicity of this treatment must be analyzed and considered.

Material and methods: 10 cases previously treated with pulmonary neoplasms and new treatment with SBRT in the same location. Pulmonary toxicity analyzed according to RTOG scale and radiological CT images after both treatments. Age: 58-88 years. Previous dose 15-61 Gy (DBE: 40-180). 1.8-15 Gy/fraction. SBRT dose: 15-50 Gy (DBE: 86-270). 10-20 Gy/fraction.

Results: RTOG toxicity: 3 Months post-SBRT: no toxicity: 3 (30%); grade 1, 7 (70%). 6 Months post-SBRT: no toxicity: 3 (30%); Grade 1, 5 (50%). One patient died and another was pending control. 12 Months post-SBRT: only three patients have completed this control. No toxicity: 1; Grade 1: 2; exitus: 2.

Radiological images: three types of radiographic alteration: atelectasis, pneumonitis and fibrosis. Analyzing the extent of these injuries:

- After first radiotherapy.
- Atelectasis: no damage, 9 cases (90%); ≤25%, 1 case (10%).
- Pneumonitis: without injury, 4 cases (40%); ≤25%, 5 cases (50%); 25-50%: 1 case (10%).
- Fibrosis: without injury, 5 cases (50%); ≤25%, 4 cases (40%); 25-50%: 1 case (45.5%).
- After SBRT.
- Atelectasis: no injury, 8 cases (80%); ≤25%, 2 cases (20%).
- Pneumonitis: without injury, 5 cases (50%); ≤25%, 3 cases (30%); 25-50%: 2 cases (20%).
- Fibrosis: without injury, 3 cases (30%); ≤25%, 5 cases (50%); 25-50%: 2 cases (20%).

Conclusion: In our analysis, SBRT toxicity after local irradiation was not excessive, as most patients had grade 1. So far we have not collected any toxicity grade ≥2.

THORACIC RE-IRRADIATION USING SBRT. CASE REPORT

Garcia Martinez, V.; Morales Marco, J.C.; Soler Catala, P.; Andreu Martinez, F.J.; Tortosa Oliver, R.; Chinillach Ferrando, N.

Purpose: To assess toxicity and feasibility of reirradiation with stereotactic body radiotherapy (SBRT) after prior lung radiotherapy for primary lung cancer.

Patients and materials: A 67 year old man with NSCLC (cT4 cN0 Mo), treated in 2012 with neoadyuvant chemotherapy and chemo-radiotherapy to arrive a total dose of 70 Gy. 2 year later present local recurrence was documented by CT, PET, and/or biopsy.

Results: We used a LINAC (Clinac DHX 2100 Varian) with the VMAT technique (RapidArc®). Doses GTV with PET fusion: 6.8 Gy, NOF: 9, Energy: 6 MV photons. The main problem is the proximity to Aorta (2 mm). One month after treatment he had not lung toxicity. We will looking forward to new image study.

Conclusions: Reirradiation with SBRT can be safely and successfully administered to patients with prior thoracic RT. Dose of SBRT should be individualized after review of the patient's potential risk for toxicity.

TOXICITY EVALUATION AND CHANGES IN PULMONARY-FUNCTION-TESTS AFTER LUNG SBRT

Cigarral, C.; Antona, C.J.; Rodríguez, S.; Gil, C.; Alonso, O.; Soria, P.; Macías, V.; Rodríguez, A.; Nieto, A.; Pérez-Romasanta, L.

Purpose and objective(s): Clinical literature has demonstrated the efficacy of SBRT for patients with inoperable stage I NSCLC or for those who refuse surgery. Several schemes have been used with low toxicity and good local control. The aim is to evaluate toxicity and Pulmonary-function-tests (PFTs) changes after lung SBRT.

Materials and methods: From May 2012 to February 2015, 39 patients with histological confirmation of early-stage NSCLC were treated with SBRT. Mean age was 71.7 years old. Main comorbidities were moderate-severe COPD and/or cardiovascular disease. The SBRT schedule was 60 Gy in 8Fx (BED10=105 Gy) delivered with arctherapy in all cases but with IMRT in 3. When it was possible, data from PFTs were obtained at baseline, 1.5 month and 1 year follow-up. Toxicity assessment was performed during and after SBRT according to CTCAE v4.0.

Results: Median follow-up was 10 months (1.9-28.9). There was no acute toxicity, but mild/moderate asthenia in 14/39 patients. There were no ≥G3 late toxicity. There were no significant changes in FVC and FEV1 scores from baseline to post-SBRT and follow-up. DLCO scores worsened from baseline to post-SBRT (p=.008), but with no significant changes from basal to 1 year after SBRT (p=.257). In the follow-up, there were no increase of pneumonia events (3/39 patients), dyspnea or worse KPS scores.

Conclusions: This initial evaluation suggests that this SBRT schedule is well tolerated with toxicity comparable to other series. Despite the initial significant changes in DLCO scores, there were no more late respiratory events in a population with important basal COPD disease.

TREATMENT VARIABLES RELATED TO LIVER TOXICITY IN PATIENTS WITH HEPATOCELLULAR CARCINOMA, CHILD-PUGH'S CLASS A AND B ENROLLED ON A PHASE I–II TRIAL OF STEREOTACTIC BODY RADIOTHERAPY (SBRT)

Lasley, F.D.; Cárdenes, H.

Purpose: We performed an analysis of patients enrolled in a phase I-II trial using SBRT for Hepatocellular Carcinoma (HCC) evaluating variables influencing liver toxicity.

Methods and materials: 38 Child-Pugh class A (CPC-A) (39 lesions) and 21 CPC-B patients (26 lesions) were enrolled in our phase I-II trial, and followed for ≥6 months. Six months local control (LC) using modified RECIST criteria, progression free survival (PFS), overall survival (OS) and grade III/IV treatment-related toxicity at 3 months were analyzed.

Results: Median follow-up was 33.3 months (2.8-61.1 m) for CPC-A and 46.3 months (3.7-70.4 m) for CPC-B patients. LC at 6 months was 92% for CPC-A and 93% for CPC-B. Kaplan Meier estimated 2 and 3 year LC was 91% for CPC-A and 82% for CPC-B (p=0.61). Median OS was 44.8 months and 17.0 months for CPC-A and CPC-B. Kaplan Meier estimated 2 and 3 year OS was 72% and 61% for CPC-A, and 33% and 26% for CPC-B (p=0.03). Four (11%) CPC-A patients and 8 CPC-B patients (38%) experienced grade III/IV liver toxicity. Overall, CPC-A patients with ≥ grade III liver toxicity had 4.59 (95% CI, 1.19-17.66) times greater risk of death than those without toxicity (p=0.0268). No such correlation was seen for CPC-B patients; however, 3 of these CPC-B patients underwent orthotopic liver transplant. CPC-B patients experiencing grade III/IV liver toxicity had significantly higher mean liver dose, higher dose to 1/3 normal liver and larger volumes of liver receiving doses <2.5 Gy -15 Gy in 2.5 Gy increments. For CPC-A patients there was no critical liver dose or volume constraint correlated with toxicity.

Conclusions: In our experience liver SBRT is a safe therapy for patients with HCC in the context of liver cirrhosis; however, for CPC-B patients, careful attention should be paid to low-dose volumes that could potentially result in increased liver toxicity.

VMAT BASED LUNG ABLATIVE RADIOTHERAPY: PRIMARY LESIONS AND METASTASES

Celada Álvarez, F.J.; Burgos, J.; Chicas Sett, R.; Martínez, F.J.; Soler, A.; Badal, M.D.; Bernisz, M.; Collado, E.; Lliso, F.; Tormo, A.

Objectives: Stereotactic ablative radiotherapy is an emerging noninvasive technique for the treatment of lung lesions. Both primary lesions and metastases may benefit from this approach, regardless the lack of adequate respiratory reserve. This work describes and evaluates institutional experience of SABR in lung location.

Material and methods: From May´12 to November´14, 82 lesions in 67 patients were irradiated. 57 lesion were primary lung tumors and 25 metastases. Each patient was immobilized with abdominal compressor and vacuum cushion or head-and-shoulders mask. An ITV was defined using three CT scans with references to the phases of respiration or with 4D RPM-Varian™ system. The PTV was obtained by uniformly 5 mm ITV expanding. BED prescription was always over 100 Gy10 in 3-8 fractions following a risk-adapted protocol. 8 treatments were performed on a Clinac iX™ and 74 treatments on a Truebeam™ with high definition MLC. Volumetric modulated arc therapy (RapidArc™) was mostly used, and image-guided RT was performed with cone-beam CT(CBCT). Intra-fraction movement was controlled by post-treatment CBCT and infra-red ExacTrac.

Results: Median age was 75y.o. (44-89). The median GTV/PTV size was 3.2/27.15 cm^3 (0.2-129.9/5.90-263.90). Intra-fraction movement in all cases was less than 5 mm according to post-treatment CBCT. At a median follow-up of 7 (1-30) months, overall local control was 92.7%, 89.5% for primary lesions and 100% for metastases. Mean overall survival was 18 months for primary lesion (14.7-21.33 [95%]). No toxicities over G3 have been collected.

Conclusions: VMAT based ablative radiotherapy achieves excellent control rates in both primary lesions and metastases. Overall survival depends on patient selection.

SNC

A PRIMARY GLIOSARCOMA GRADE IV WITH LONG SURVIVAL: A CASE REPORT

Aymar, N.; Guerrero, A.; Ortiz, I.; Montemuiño, S.; Vidal, M.

Objective: Gliosarcoma is an infrequent variety of multiform glioblastoma with a very short overall survival. We present the case of a gliosarcoma grade IV treated with adjuvant radiochemotherapy with a survival rate of 3 years after the end of the treatment.

Material and methods: A 63-year-old woman was diagnosed with gliosarcoma grade IV by magnetic resonance imaging (MRI) that showed a temporal heterogeneous right-hand-side mass with cystic areas and heterogeneous surface with relevant necrosis after contrast. Surgery was performed, identifying a very consistent and heterogeneous tumour that affected the second and third right temporal circumvolution. The tumour had a more friable and poorly defined medial area in relation to the temporal horn of the right lateral ventricle. Radiochemotherapy was administered, giving a dose of 60 Gy in 30 fractions at the tumour bed, with concurrent temozolomide 75 mg/m^3/day plus 6 sequential cycles, 150-200 mg/m^2/day for 5 days every 28-day period. Follow-up evaluation was made every 4 months.

Results: The patient was asimptomathic 3 years after finishing the radiochemotherapy, and no signs of local recurrence were found in the following MRIs. As side effects of the treatment, she presented a mild memory loss.

Conclusions: According to studies, the gliosarcoma's overall survival rate with standard treatment is 4 to 18.5 months. The presented case demonstrate that in rare instance, gliosarcoma may show prolonged survival with surgical excision followed by concurrent radiochemotherapy.

ACOUSTIC NEUROMAS RADIOSURGERY: DOSE-RESPONSE RELATIONSHIP

Ferrera Alayón, L.; Blanco Sánchez, L.; Peña Perea, M.T.; Keituqwa Yañez, N.; Valle Martín, P.J.; Peñate González, J.G.; Otón Sánchez, L.F.

Introduction: This paper addresses the AN treated with linear accelerator radiosurgery in our center. The main purpose was to assess the relationship for tumor control and complications in terms of dose-response.

Patietns and methods: Retrospective study of 74 patients treated with radiosurgery of AN between June 1998 and January 2014.

Results: Just one case of tumor regrowth was reported, resulting in a 98.5% rate of tumor control with a median follow up of 58 months. A low number of cases developed complications: two facialneuropathies and four transitory trigeminal neuropathies.

Higher doses resulted in a clear trend to develop facial neuropathy. We did not find association between other complications and higher doses.

Conclusion: An isocenter dose of 14.5-15.5 Gy achieves an optimal tumor control with few complications. Doses higher than 17 Gy are coupled with an increased risk of complications. Radiosurgery can be considered as the preferred therapy for patients with AN smaller than 30 mm.

VANCED ENDOMETRIAL CANCER WITH SURGERY, CHEMOTHERAPY AND ABDOMINOPELVIC RADIOTHERAPY (SQTWAPI)

Rodríguez González, V.; Lora, D.; Casado, M.; Campos, A.; Chávez, CT.; Gascón, N.; Prados, RM.; Colmenero, M.; Cabeza, MA.; Pérez-Regadera, J.

Introduction: Patients with advanced endometrial cancer are a very heterogeneous group in which the prognosis is influenced by the number of extrauterine locations, abdominal and nodal spread, type of surgery, tumor residue and histology.

Methods: We studied 47 patients with SQTWAPI. FIGO staging IIIA 6 patients, IIIC 22 and IVB 16. Mean follow-up for disease-free survival (DFS) 32 months. In 26 were found ≤3 extrauterine locations (≤3LE) and in 21>3LE. Abdominal spread was present in 26 and was not in 21, negative lymph node spread 11 (G-), positive 33 (G +) and unknown 3 (G?). Combination of abdominal dissemination and lymph node spread (AG) was observed in 19 patients, only abdominal 7 (SA), single nodal 17 (SG) and no abdominal or nodal 4 (NAG). In 23 ovarian surgery was performed and in 24 suboptimal. In 8 remained tumor residue and 39 did not. 19 patients had endometrioid histology and 28 had different one. Histological grade 1-2 in 11 and G3 in 36.

Results: The 5-year DFS was respectively: ≤3LE patients was 69% vs 30%>3LE (p 0.0445). With abdominal spread 73% vs 35% without (p=0.05). Group (G-) 90%, group (G+) 47% and group (G?) 0%, (p 0.0062). No residue 54% vs 34% (p 0.11). Group (AG) 22%, group (SG) 65%, group (SA) 85%, group (NAG) 100% (p 0.0185). With ovarian protocol sugery 42% and without 62% (p 0.23).

Conclusions: The number of extrauterine locations, lymph node spread, abdominal dissemination and the combination of both influenced the SLE.

ANAPLASTIC OLIGODENDROGLIOMA WITH METASTATIC CERVICAL ADENOPATHY: REVIEW OF ONE CASE

Reyes, J.A.; García-Grande, A.; Castaño, A.; Romero, A.; Silva, D.; Colmenar, A.; Ruiz, M.J.; Miralles, L.; Mañas, A.

Background: Brain tumors with extraneural metastases are very rare disease. A literature review of tumors involving the CNS with extracranial metastasis, including 23 previously reported metastatic Anaplastic Oligodendroglioma (AO), the most frequent site was bone and bone marrow (42.7%) followed by lymph nodes (20.0%). Extraneural metastasis is considered correlated with previous craniotomies, a 282 reported cases of glioma with metastases outside the CNS only 24 (8.5%) were without previous surgical intervention.

Case report: A 45-year-old woman with headache, left hemiparesis and diplopia was admitted to our hospital in September 2013. Magnetic resonance imaging (MRI) showed a multiple lesions in the right hemisphere. On October 2013 she underwent a right temporal craniotomy with biopsy and subtotal resection of right temporal lesion. A diagnosis was made of AO grade III. Adjuvant radiotherapy was given in the right temporal, frontal and corpus callosum lesion (60 Gy). In January 2015, she presented with headache and cervical mass. MRI showed evident progression of the intracranial lesion and new focus in cerebellar. Fine needle aspiration cytology of the cervial adenopathy revealed a metastasis of AO, based on immunohistochemical staining.

Conclusion: Extracranial metastases in AO are very rare, but not impossible. The low incidence of extraneural metastases of malignant brain tumors is attributed to the brain's lack of a lymphatic system, the impermeability of the dura mater, and the compression of delicate intracerebral peritumoral capillaries by the tumor mass. It is important to be aware of the rare possibility that primary malignant brain tumor could metastasize extraneurally.

ANGIOGENESIS AND METHYLATION IN GLIOBLASTOMA MULTIFORME (GBM): IS THERE A CORRELATION BETWEEN THEM?

López-muñoz, M.; Soler, M.; Gaspar, C.; Zúñiga, A.; Cremades, A.; Molla, E.; Piquer, J.; Estornell, MA.; Monroy, JL.; Rodríguez, D.

Introduction: The gene promoter methylation enzyme 6-methyl-guanine-DNA-methyl-transferase (MGMT) could be considered Predictive Factor of Response to Treatment with Temozolomide in GBM. Increased angiogenesis is characteristic in these tumors.

Objectives: Determine whether there is a relationship between methylation status of MGMT in GM Multiforme and the degree of tumor angiogenesis.

Patients and methods: The is a retrospective study in 22 patients with GBM histologically confirmed. The median age 66.5 years (range 24-78) and were treated with citorreductive Surgery followed by Radiotherapy plus Temozolomide (TMZ). Pretreatment surgical 11 ptes: total removal: 6, Partial 5. All patients received combined treatment with Radiotherapy (median dose: 56.65 Gy) and conventional TMZ 75 mg/m^2 followed by maintenance CT 150-200 mg/m^2 (Stupp regimen). The methylation status of MGMT gene was performed by specific PCR assay across pyrosequencing technique in brain tumor tissue samples. The relationship with the state of tumor angiogenesis was evaluated with the degree of perfusion MRI (taken as a positive value of increased vascularity of 2.5).

Results: Around 35% of tumors exhibit MGMT methylation, 18 patients have a greater degree of angiogenesis 2.5, in 2 patients angiogenesis equal to the objective of healthy tissue and in 1 patient is lower than this. Applying the chi-square test for methylation-related variables angiogenesis the value of p=0.93.

Conclusions: In our preliminary analysis we found no relationship between MGMT methylation status and degree of tumor angiogenesis. We hope to have a wide serious to deliver results in the knowledge of predictors of response in GM.

CLINICAL EXPERIENCE WITH VOLUMETRIC MODULATED ARC THERAPY IN PROSTATE CANCER

Jiménez, R.; Fernández, C.; Moreno, P.; Begara, J.; García, C.; Navarro, V.; Ríos, B.; Nuño, C.; Vallejo, A.; Recio, F.J.

Introduction: VMAT is a revolutionary technology that permits highly conformal radiation treatment. When combined with the precision of IGRT, this technique permits hypo-fractionation and thus establishes new standards for radiation therapy treatment speed and dose reduction. Our objective is to inform of technical aspects, clinical outcomes and acute side effects in patients treated with VMAT, IGRT and hypo-fractionation.

Patients and methods: From 2010 until 2014, 150 prostate cancer patients with a median age of 67.92, (range 48-77) were treated.

Haematological, clinical, therapeutical and toxicity information was evaluated with CTCAE at the end of treatment. PSA determination 1 month after treatment and then every three months.

Results: With PSA median of 10.06 ng/ml at diagnosis time (range 2.8-43.79) patients presented localized staging (pT1c=35.3%; pT2a-c=51.1%; pT3a-c=13.3%; N0=100%). According to NCCN 26.6% of patients were low risk, 45.8% medium and 24.6% high. 27.5% were biochemical relapses, 8.7% adjuvant and 63.8% radical treatment. 35.1% received hormone therapy. All patients were treated with IGRT followed by VMAT. The median dose administered was 6 6 Gy (60-66). All patients received 3 Gy fractionation in 20 to 22 days. No patients presented acute GII/III rectum toxicity and only 13% presented acute GII bladder toxicity. With a median follow up time of 18.8 months (1-24) 91.2% of the patients are disease free with a PSA medium of 0.59 ng/ml (0-7.86).

Conclusion: Advanced techniques in radiotherapy permit hypo-fractionation which provides treatment speed, dose reduction, less side effects and more quality of life.

COQ MISLEADS MITOCHONDRIA AND RADIOSENSITIZES GLIOBLASTOMA MULTIFORME THROUGH DIVERSE MECHANISMS

Frontiñan, J.; Santiago-Mora, R.; Martinez-Gonzalez, A.; Ferrin, G.; Arregui, E.; Arjona-Gutierrez, J.; Peinado, J.R.; Perez-Garcia, V.; Alcain, F.J.; Duran-Prado, M.

Glioblastoma multiforme (GBM) is specially radioresistant, which is driven by the pathophysiology of the mitochondria and the over-production of radical oxygen species (ROS). These ROS, particularly the produced by the mitochondrial electron transport chain complex II (ETCCII), reinforces the glycolytic metabolism, even in normoxia, promoting lactate production. Moreover, ROS also induce the expression of antioxidant enzymes like catalase and increase glutathione level, which added to lactate, increase radioresistance. Herein we describe a novel approach to treat GBM, in vitro, with the lipophilic antioxidant coenzyme Q10 (CoQ), a component of the ETC that target ROS produced in the CII. Using diverse cellular and molecular approaches, we have found that human GBM cells incubated with increasing concentrations of CoQ (2.5-10 μM) showed a 50% reduction in O_2.- and H_2O_2 levels, accompanied by an increase in ETC CII respiration without affecting oxidative phosphorylation. These results are paralleled by a decrease in cell viability and in intracellular lactate, due to an inhibition of glycolysis. Moreover, modulation of ROS levels also reduced catalase and glutathione, two principal antioxidant molecules responsible of resistance to pro-oxidant therapies as ionizing radiation. In this setting, we found that CoQ-treated cells were more sensitive to radiation that control cells, with was translated in a higher pro-apoptotic effect of radiation, obtaining ED50 of 1,3 and 2,5 Gy for CoQ and control, respectively. These results were also reproduced in long-term clonogenic experiments. As a whole, CoQ could be a promising compound for the treatment of GBM, targeting radioresistance from its early origin.

EXPERIENCE IN THE MANAGEMENT OF ATYPICAL TERATOID RHABDOID TUMOR (ATRT)

Avila Delgado, V.H.; Flores Rodriguez, J.D.; Mateos, J.C.; Ortiz, M.J.; De Haro Piedra, R.; Campos Triviño, B.M.; Cabrera Roldan, P.

Objectives and purpose: Descriptive analysis of the treatment of ATRT of the central nervous system, according to protocol EU-RHAB. Experience from our center from the year 2005 to 2014.

Material and methods: 11 patients were treated, 6 (54.6%) men and 5 (45.4%) women, 9 (81.8%) were children and 2 (18.2%) adults; of the children, 7 were younger than 24 months of age; average age 18 months (range 3-615 months). The location was supratentorial in 5 (45.4%) and infratentorial in 6 (54.6%). For anatomical location 5 (45.4%) in cerebellum, 2 (18.2%) in frontal lobe, 1 (9.1%) in medulla oblongata, 1 (9.1%) pineal, 1 (9.1%) pineal- III ventricle and 1 (9/1%) in frontal lobe-basal ganglia. At diagnosis all were operated, with complete resection at 8 (72.7%) and incomplete at 3 (27.3%). Chemotherapy QT was administered in 10 (90.9%) patients and 7 (63.6%) received radiotherapy (RT); of those treated with RT, 4 received Volumetric Arc Radiation Therapy (VMAT), 2 RT3D and 1 tomotherapy with dosage of 48-54 Gy. Loss of expression of protein in 9 (81.8%) patients and unknown in 2 (18.2%).

Results: The median treatment follow-up period was 7 months (range 0-19 months); demonstrating that 4 patients are found alive; 3 without tumor (27.5%) and 1 with tumor (9%). 7 patients died: 6 (54.5%) by tumor progression and 1 (9%) by intercurent cause.

Conclusions: ATRT are predominant in those under 24 months of age. Even with treatment-combined surgery, QT and RT survivability is limited, what limits the assessment of long-term toxicity and second tumors.

FRAMELESS RADIOSURGERY FOR ACOUSTIC SCHWANNOMA: A FIVE-YEAR EXPERIENCE

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Purpose: Frameless radiosurgery (SRS) plays an important role in the management of acoustic neuromas. This retrospective study aims to evaluate tumor control using this technique.

Materials and methods: Thirty four patients with unilateral acoustic neuromas (vestibular schwannomas) who underwent linear accelerator-based frameless SRS at low dose (12 Gy) to the tumor from July 2008 to February 2015 were evaluated. Twenty-one patients were male and 13p were female. The median age was 62 years (range 23-84) with a median follow-up period of 12.4 months (range 1-60). Treatment volume was 0.1 to 3.8 cm^3 (median 0.93 cm^3).

Results: Preliminary results from follow-up magnetic resonance imaging (MRI) showed: the tumor of 15 patients decreased in diameter, no changes was found in 14 and the tumor increased slightly in only one patient. All patients are alive, except for 1p who died from intercurrent disease 2 years after radiosurgery. Among 23p with acufeno, full improvement was demonstrated in four. There were no reported complications related to treatment.

Conclusions: We experienced excellent short term local control and low incidence of complication for acoustic schwannomas undergoing frameless SRS treatment. Our data compare favorably with the literature. Additional follow-up will be necessary to evaluate long term results of treatment.

FRAMELESS RADIOSURGERY WITH VMAT VERSUS FRAMED RADIOSURGERY WITH ARC-THERAPY IN ACOUSTIC NEUROMA: DOSIMETRIC ANALYSIS

Bezares Alarcon, A.; Ramos Trujillo, A.; Alvarez Mateos, D.; Ruíz Aznar, C.; Acedo Moreno, M.; Roman Vazquez, A.; Fernández González, M.; Garrido Santamaría, A.M.; Luque Campuzano, C.; Serradilla Gil, A.

Introduction: The used of framed-based radiosurgery in acoustic neuroma is widely accept. This approach need to

atached the frame to the patient´s skull. An alternative to the invasive patient fixation is the use of Frameless systems.

Objectives: Comparative dosimetric study betwen framed-based radiosurgery and frameless radiosurgery.

Methods: We compared 10 patients with acoustic neuroma treated with radiosurgery in one session, 5 using framed-based and 5 with frameless radiosurgery.

Results: All patients were treated with 12 Gy in one fraction. Patients with frameless radiosurgery were also treated with VMAT and Cone beam computed tomography (CBCT) scans were taken immediately before each treatment to evaluate the positional accuracy. We compared dosimetric parameters for Dmax, Dmed and Dmin for organ at risk, D50%, D2%, D98%, conformity and homogeneity indexes for target volume and numbers of arcs, MU, and irradiation time.

Conclusion: Our findings suggest that framed-based radiosurgery with VMAT provide good dosimetrics results and will became an alternative to framed-based radiosurgery.

FRAMELESS STEREOTACTIC RADIOSURGERY IN BRAIN METASTASES

Rivas Sánchez, D.; López Ramírez, E.; Arregui Castillo, G.; Lazo Prados, A.; Gómez Oliveros, J.; Sacchetti Fernandes de Passos, A.

Objectives: Frameless Stereotactic Radiosurgery (SRS) is a technique increasingly used for brain metastases treatment. A non invasive mask system with image-guided radiotherapy (IGRT) is an attractive and comfortable alternative. We evaluated our clinical results in brain metastases treated with Frameless SRS and IGRT. Materials and **Methods:** Between August 2010-February 2015 we treated 30 patients (p) with a total of 78 brain metastases (1-11 lesions). The 33.33% were women and a mean age of 57.27 years (33-83). We have performed a total of 42 treatments. Our PTV margin was 2-3 mm. We evaluated clinical and therapeutic data.

Results: The origin of metastases was: lung (13 p), breast (8 p), melanoma (5 p), and cérvix, esophagus, ovary, rectum (1 p each). Nine patients (30%) were also treated with whole brain radiotherapy (WBRT). Radiotherapy techniques used were: Volumetric Modulated Arc Therapy (23 p), IMRT step and shoot (13 p), Dynamic Arc Therapy (1 p) and 3D conformal radiotherapy (5 p). The hypofractionated schemes more used were: 6 fractions of 6 Gy (6 p) and 3 fractions of 10 Gy (15 p). The accuracy of positioning collected in the literature for frameless SRS is 1-4 mm. In our series, the accuracy was: X=0,24 mm (0,01-0,65); Y=0,23 mm (0,06-0,66); Z=0,23 mm (0,01-0,45). There was no acute toxicity. With a mean follow-up of 7.13 months (1-44), 10 p are alive, 20 p died (13 of them without WBRT). Our local control was 80%. The causes of death were progression in: brain (6 p), lung (7 p) and liver (2 p), unknown (3 p) and deterioration (2 p).

Conclusions: Frameless SRS is an effective treatment for local control and a confortable treatment for patients with brain metastases. This non invasive technique with IGRT is associated with a high precision in positioning.

FRAMELESS-RADIOSURGERY WITH VMAT FOR BRAIN METASTASIS. DOSIMETRIC RESULTS OF 7 PATIENTS TREATED IN OUR INSTITUTION

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Introduction: The used of framed-based radiosurgery is widely accept. This approach need to atached the frame to the patient´s skull. An alternative to the invasive patient fixation is the use of Frameless systems.

Objectives: We analized dosimetrics results of 7 patients with brain metastasis treated with frameless SRS as primary treatment with a comercial frameless system (FRAXIONTM from Elekta) used for patient immobilization and planificated with VMAT.

Methods and material: All patients were inmobilizated with a Thermoplastic Mask and vacuum Mouthbite Combination. The target volume and OAR were identified on the basis of the fused CT and magnetic resonance (MR) images. Radiation doses were delivered in a single fraction with noncoplanar dynamic arcs, planificated with VMAT, by using a 6-MV LINAC. All patient were treated with IGRT, a computerized tomography scan (cone beam) was made before and after SRS used to evaluate the accuracy of patient repositioning.

Results: In all cases dosimetry performed with VMAT planning, achieved excellent results for homogeneity and conformity indexes and protection of organs at risk. Likewise positioning accuracy was submillimeter. The difference in positioning after irradiation was also submillimeter.

Conclusions: Frameless SRS with VMAT is an effective treatment in the management of patients with brain metastases. The frameless-SRS system is associated with a high degree of patient repositioning accuracy.

GLIOMATOSIS CEREBRI: DIAGNOSIS AND TREATMENT WITH RADIOCHEMOTHERAPY; A CASE REPORT

Calvo Tudela, A.; Fonseca Vallejo, R.; Castillo Pérez, I.; Asensio C.; Garcia Puche, J.L.

Background: Gliomatosis cerebri is a rare diffuse glial tumor; implies involvement of at least two brain lobes. We report a patient diagnosed and treated gliomatosis cerebri.

Methods: 58 years old woman consultation in March 2012 by subacute box motor dysphasia and left hemiparesis. Nuclear Magnetic Resonance (NMR) is requested highlighting a front and left insula area that captures contrast as well as one right parietal and another in thalamus nuclei rights base. The patient comes to neurosurgery for organization of biopsy (10 april). The result was Glioblastoma Multiforme Ki67 + in 10%; with the diagnosis of gliomatosis cerebri derive the patient to our Service.

Results: May 7th 2012 begins adjuvant radiotherapy (dose 60 Gy) and concomitant temozolomide (dose 120 mg/day). Irradiation volume included injuries and technical safety margin; 6 MeV photons, and isocentric technique with 2 courses conformed to the volume described as 3D planning were used. Ends on June 27th with good immediate tolerance. In August comes to revision; left hemiparesis persists without other neurological focus. NMR evidence brain control decrease lesion size regarding NMR diagnosis. We decided to complete Temozolomide treatment with full dose. At the end of treatment remains widespread loss of strength and inability to walk. The patient was admitted to hospital palliative and lost track.

Conclusions: The therapeutic approach is not well established; the addition of chemotherapy to radiation appears to offer greater response rates, although its impact on survival remains low. Multicenter Phase III studies to evaluate the different therapeutic strategies are needed.

HIGH GRADE GLIOMAS AND OVERALL SURVIVAL. OUR SINGLE INSTITUTIONAL EXPERIENCE

Alonso Sánchez, D.; Balbin, M.; Matallanas, M.; Riveros-Pérez, A.; Centeno, I.; Pérez-Payo, P.; Pitiot, A.S.; López, M.; Canteli, M.

Objetives and aims: To analize a single institution results on high grade gliomas treatment.

Material and methods: We included prospectively all consecutive patients diagnosticated with III and IV grade gliomas (excluding oligodendrogliomas, oligoastrocytomas or infratentorial gliomas) from November 2010 to August 2014. All were treated with the wider posible surgery followed by radio and chemotherapy at our institution. Statistical analysis was estimated with the Kaplan-Meier method. P-values <0.05 were considered significant.

Results: We studied 89 consecutive patients. 59.64 years old average (28-79). 55.1% men. 71 patients grade IV and 18 patients grade III. Karnofsky mean 80.90% (40-100). Karnofsky mode (40% of patients)=90%. Most frequent location was frontal lobe (38.2%). Treatment achieved withim less than 3 months from symptoms to surgery in 77.5% of cases. 28.1% were biopsies, 69.7% partial resections and 6.7% complete resection. Complete chemotherapy was administered to 74.2% of patients and complete RT3D (59.4 Gy/33 sesions) to 83.1% of patients. OS mean was 22.06 (4-42) months for Astrocytoma and 11.03 (1-31) for Glioblastoma. 66 were exitus at the end of this study. Variables showing significant impact on patients overall survival were: pathological type (III vs IV) (p=0.002), MGMT-methylation positive (p=0.023), IDH1- mutation (p=0.005), Karnofsky≥70% (p=0.029), complete radiotherapy (p=0.000), surgery (complete vs partial vs biopsy) (p=0.026). However, not age <70 (p=0.099).

Conclusions: Overall survival data is in line with previous resports on this patients population. Molecular markers like MGMT-methylation are also significant prognostic factors. Karnofsky at diagnosis is suggested like an important prognostic factor, but not age?

HIPPOCAMPAL AVOIDANCE IN WHOLE BRAIN RADIOTHERAPY (WBRT) AND PROPHYLACTIC CRANIAL IRRADIATION (PCI)

Payano Hernandez, S.V.; Garcia Ruiz-Zorrilla, J.; Hernando Requejo, O.; Valero Albarran, J.J.; Ciervde Jurio, R.; Sanchez Saugar, E.; Garcia-Aranda, M.; Montero, A.; Potdevin Stein, G.; Rubio, C.

Introduction: WBRT for the palliation of metastases or as PCI to prevent intracranial metastases, can be associated with decline in memory and other cognitive functions. Sparing the hippocampus during cranial irradiation poses important technical challenges with respect to contouring and treatment planning.

Purpose: To evaluate feasibility of sparing hippocampus in 30 Gy WBRT and 25 Gy PCI.

Methods and materials: 9 patients were enrolled (5 WBRT and 4 with PCI). Brain and hippocampus were contoured using iPlanNet® or Ray Station on fused MRI and CT. WBRT: 90% of the whole brain PTV is covered by the prescription dose, Maximum dose to 2% of the PTV (D2%) is 37.5 Gy, and minimum dose to 98% of the PTV (D98%) is 25 Gy. PCI: 90% of the whole brain PTV is covered by the prescription dose, Maximum dose to 2% of the PTV (D2%) is 31.25 Gy, and minimum dose to 98% of the PTV (D98%) is 21 Gy. Hippocampus: Dose to 100% of the hippocampal volume (D100%) ≤9 Gy and Maximum dose ≤16 Gy.

Results: Average and median of the maximum doses in Hippocampus in WBRT group were 15.55 Gy-15.04 Gy respectively, average and median D100%: 7.57 Gy-7.4 Gy, respectively. In PCI group: Hippocampus: 14.25 Gy-13.54 Gy, respectively. With both D100% of 6.8 Gy. V100 for the rest of the brain parenchyma were 91% in both group, D2%: 37 Gy (WBRT) and 30 Gy (PCI). D98%: 26 Gy (WBRT) and 23 Gy (PCI).

Conclusion: IMRT techniques allow sparing hippocampus with acceptable target coverage.

HIPPOCAMPAL SPARING WHOLE BRAIN IRRADIATION

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Purpose: Hippocampal neural stem-cell injury during whole-brain radiotherapy (WBRT) may play a role in memory decline. Hippocampal sparing whole brain radiotherapy (HS-WBRT) may delay or reduce the frequency and severity of neurocognitive decline in these patients. We present initial data on the first 11 patients treated in our institution with HS-WBRT.

Material and methods: Eleven patients have been treated in our institution with HS-WBRT, nine prophylactic cranial irradiation for small lung cancer and two for brain metastases, to a dose of 30 Gy (10-15 fractions). RTOG 0933 recommendations were applied for treatment planning. Magnetic resonance imaging (MRI) and computerized tomography (CT) sets were fused for each patient prior to delineation of the hippocampus. Intensity-modulated radiotherapy (IMRT) treatment plans for the Varian 2100CD linear accelerator were generated using the DMPO algorithm of Pinnacle TPS for optimizing a 12 beams solution class.

Results: The value of the maximum dose mean in the hippocampus was less than 17 Gy (14-16.6 Gy). The value of mean dose in the whole brain was 30.95 Gy, with a maximun dose range of 36.4-40 Gy. The maximum dose to optic nerves and chiasma did not exceed 37.5 Gy. Mean number of segments and monitor units was 100 and 994 respectively. Conformation index mean value was 0.85.

Conclusions: The results obtained in this serie of patients of our institution with HS-WBRT are comparable with the published series, fulfilling the recommendations of the RTOG 0933.

HIPPOCAMPAL-AVOIDANCE WHOLE-BRAIN RADIOTHERAPY (HA-WBRT): INITIAL RESULTS IN OUR INSTITUTION

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Background and purpose: HA-WBRT is a novel technique that allows us to preserve the memory without compromising tumor control according to recent studies. The purpose of our study is to show our experience in terms of technical feasibility and local control.

Materials and methods: Between 2012 and 2015 we treated 16 patients with or without brain metastases (BM). We used the recommendations of the RTOG-0933 trial to contour the hippocampus and to define the OAR constraints. We performed an IMRT treatment in a LINAC model TrueBeam. Different doses and fractionations were used.

Results: We treated 16 patients. Mean age: 64years. Fourteen were lung cancers (both NSCLC and SCLC). Seven patients were treated with a prophylactic intent and received 25 Gy/10 sessions; nine patients had BM (eight of them <4) and received 30 Gy/10 sessions. Eight patients with BM were pretreated (radiosurgery/surgery) and two patients with resected lesions received a simultaneous boost to the surgical bed. The hippocampus was spared with a median dose of 7.85 Gy and maximum dose of 9.9 2 Gy on average, with an adequate coverage of the PTV. We had only one brain relapse, outside the hippocampus. Six patients died of their primary tumors and the mean overall survival was 6.44 months (1-19). No grade 3-4 toxicities were reported.

Conclusion: Modern IMRT techniques allow for sparing the hippocampus with acceptable target coverage and low rate of side effects. Although our results in local control and survival are promising, it is required a longer follow-up to confirm this.

INTRACRANEAL SKULL-BASE MENINGIOMAS TREATED WITH TOMOTHERAPHY; SAN SEBASTIAN ONCOLOGY INSTITUTE

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Aims: The results of local control, toxicity and survival in patients (pts) with typical and atypical intracranial skull base meningioma treated with helical tomotherapy (HT) technique were retrospectively analyzed.

Methods: Between October 2009 and January 2015, a total of 27 pts and 28 meningiomas have been treated with HT (71% female and 29% male), with median age of 61 (range, 32-83). Histologically, 64% were typical and 36% atypical meningiomas. Three pts had meningiomatosis and 3 radiation-induced meningiomas. Seventeen out of 28 meningiomas were previously treated (13 surgery, 4 surgery plus radiosurgery). IMRT by using a 6MV photon fan-beam technique and tomoimage-guided was carried out daily. The median prescribed dose was 50 Gy (typical) and 54 Gy (atypical), at 180 cGy/fraction, 5 fractions/week.

Results: The median follow-up was 29,7 months (range, 1.3-64 months). G1-G2 acute toxicity was reported in 43% pts; no ≥G3 toxicity was seen. G1-G2 chronic toxicity was 4% and any late sequela of cranial nerves deficits were observed. Overall local control was 86% and 96% if excluding radiation-induced meningiomas. Four out of 28 meningiomas failed at 6, 14, 28 and 32 months after treatment, being 3 radiation-induced meningiomas. Fifty four percent of the 90% of pts with neurological symptoms at diagnosis improved after treatment. Five year progression-free survival (PFS) for typical and atypical meningiomas was 100% an 83.3% respectively. Overall survival was 97% but cause-specific survival was 100%.

Conclusions: HT technique shows excellent local control without any late toxicity in treatment of skull base intracranial meningiomas.

LACOSAMIDE FOR THE TREATMENT OF BRAIN TUMOR RELATED EPILEPSY

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Purpose: Epileptic seizures are a frequent and limiting complication of patients with brain tumours (BRTE). Lacosamide (LCM) is a third-generation AED with well-established efficacy, a favourable tolerability profile, low potential for drug-drug. To date, few studies have investigated its use in BTRE.

Methods and materials: An observational, non-interventional retrospective study conducted in six centres in Spain. Primary objective: evaluate the efficacy of LCM in BTRE (number of seizures after 3 and 6 months versus baseline). Secondary objectives: to determine the safety and tolerability of LCM.

Results: A total of 39 patients who had experienced ≥1 convulsive seizure episode due BTRE and had received at least one dose of LCM were included. Reason for initiation of LCM treatment: lack of efficacy (76.9% patients) or tolerability (12.8% patients) of prior AEDs. At 3 months, total seizure frequency was significantly reduced by a mean of 16.1 events (22.9 [±44.5] vs 6.8 [±19.8] mean seizures at 3 months; p<0.0001). No patients experienced a generalised seizure. At 6 months: seizures significantly reduced by a mean of 18.1 events (26.4 [±50.4] vs 9.4 [±22.8] mean seizures at 6 months; p<0.0001). LCM was generally well tolerated, with three out of 26 patients (12%) reporting drug-related AEs during 6 months of treatment.. The most commonly reported AE was asthenia (two patients). No neurocognitive deficits, cardiac AEs or liver function abnormalities were reported.

Conclusion: LCM was both well tolerated and active as an add-on AED in patients with brain tumours, allowing for concurrent use with other AEDs.

LARGE VESTIBULAR SCHWANOMAS (VS) TREATED WITH STEREOTACTIC RADIOSURGERY (STR) OR FRACTIONATED STEREOTACTIC RADIOTHERAPY (FSRT)

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Purpose: To determine Radiologic Local Control (RLC) defined as a decrease or stability in tumor size, and Clinical Local Control (CLC) defined as absence of need for a new treatment, in Vestibular Schwanomas larger than 30 mm or Koos Grade IV, treated with STR or FSRT.

Material and methods: Retrospective analysis of 22 patients diagnosed with large VS and either considered not suitable for surgical treatment or surgically removed with a subtotal tumor resection that were treated with STR or FSRT from February 1997 to January 2012, with a minimum follow up of 36 months.

Results: A total of 22 patients with VS, 15 of them treated with SRS and 7 treated with FSRT. Mean tumor volume was 11.39 cc. Mean age was 57 years, with no differences in gender. Four patients had a subtotal resection performed before RT treatment, one received SRS and the other 3 FSRT. We achieved a RLC of 91%, and CLC at 5 years was 91%. There was no significant acute toxicity, only one patient who experienced transitory trigeminal toxicity, with no facial nerve involvement. There were 2 patients who presented with hearing loss from baseline, and one patient who developed an arachnoid cyst that needed surgical drainage. There were no radiation-induced brain malignancies.

Conclusions: Treatment with Radiotherapy for large VS, achieves a tumor control rate of over 90% and it is an accepted treatment option for patients who are not suitable or do not wish to undergo surgery.

LONG TERM OUTCOME OF PATIENTS WITH GLIOBLASTOMA TREATED WITH SURGERY-IMRT-TEMOZOLAMIDE

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Introduction: The patterns of failure in patients (pats) with glioblastoma (GB) treated with conventional treatment are predominantly local (80-90%). Few studies have evaluated the topographical distribution of recurrence with IMRT.

Material and methods: Pats diagnosed of GB were included in a prospective study. Treatment consisted of 5-ALA-guided surgery, postop-IMRT with concomitant-temozolomide (TMZ) and adjuvant-TMZ. Target volumes were outlined using trimodality image fusion with CT/MR/11C-MET-PET. GTV was defined as the surgical cavity plus the residual disease. CTV included the GTV plus 2 cm margin and the PTV was generated after 0.3-0.5 cm expansion of the CTV. Prescription doses were 70 Gy, 65 Gy and 60 Gy to the 95% of the GTV, CTV and PTV, respectively. Central, local, marginal and distal failures were defined when the recurrence was located within the 65 Gy-IDL, 55-60 Gy-IDL, 30-50 Gy-IDL and outside of the 30 Gy-IDL, respectively.

Results: From Jan07 to June14, 57-pats with a MFU of 60-months (11.96-94.29 months) were enrolled in the study. Thirty-three pats (57.9%), 8-pats (14%), 3-pats (5.3%) had central

and/or local failures, distal and mixed recurrences, respectively. Local-central control was achieved in 22-pats (38.6%). Central recurrences were more frequently observed in pats with unmethylated-MGMT 82%-vs-64% (p=0.5). Median and 4-year OS were 20,4-months and 11%, respectively.

Conclusions: The patterns of failure were predominantly local-central (57.9%). Using 11C-MET-PET planning images and highly conformal dose distribution, we have not observed an increase in marginal recurrences rates. Patients with unmethylated-MGMT tumors have more local-central recurrences. Future studies with a greater number of pats are needed to confirm these data.

LONG-TERM SURVIVAL IN GLIOBLASTOMA MULTIFORME. CLINICAL AND PATHOLOGICAL FEATURES IN PATIENTS TREATED WITH CONCOMITANT RADIATION PLUS TEMOZOLAMIDE

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Objective: Glioblastoma multiforme (GBM) is the most common and most malignant primary brain tumor in adults Long-term survival is rare in patients with GBM. We present a single institution patient series examined for prognostic factors using uni- and multivariate survival analysis.

Methods: 50 consecutive patients (27 male 23 female) age 77-31 years (median 56) were included who underwent craniotomy for newly diagnosed glioblastoma WHO grade IV between 2009 and 2014 at our department. All patients were treated with surgery (complete resection 12 p, incomplete 38 p) followed by concurrent temozolamide (75 mg/m^2/day) and radiotherapy (median tumor dose 60 Gy) followed by temozolamide, 200 mg/m^2/day for 5 consecutive days every 28 days. Neurologic evaluations and cranial MRI were performed every 3 months. We analyzed age, gender, seizure, karnofsky performance score, tumor location, extent of resection, surgical rescue The association to patient survival was estimated using log-rank test for univariate analysis and cox regression method for multivariate analysis.

Results: At a mean follow up of 21 months, the median overall survival (OS) was 17.2 months,... patients (15-20%) 34% showed no disease progression for 18 months, and 20% for 36 months. From the beginning of treatment. Grade 3/4 haematologic toxicity was observed in 10% of the patients. In univariate analysis, significant correlation was found between OS and no/minor neurologic deficit at diagnosis, age ≥60 years, tumor size >5 cm, complete resection. In multivariate analysis, only the absence of major neurologic deficit remained and performance status were associated with overall survival (p=0.01).

Conclusions: Te results suggest that analysis of prognostic markers in long-term survivors GMB is complex. 3D conformal RT with temozolamide achieved acceptable disease control with satisfactory compliance and toxicity, in a subgroup of patients with good prognosis.

MGMT PROMOTOR METHYLATION AND HIGH GRADE GLIOMAS PROGNOSIS

Alonso Sánchez, D.; Balbin, M.; Matallanas, M.; Centeno, I.; Riveros-Pérez, A.; Pitiot, A.S.; Santamaría, I.; Pérez-Payo, P.; Caminero, M.

Objetives and aims: To evaluate the relathionship between MGMT (methylguanine-DNA methyltransferase)-promotor methylation and overall (OS) and disease-free survival (FS).

Material and methods: We included all patients diagnosticated with grade III and IV gliomas from November 2010 to August 2014 prospectively. All were treated with surgery, radiotherapy and chemoterapy in our institution. We excluded oligodendrogliomas, oligoastrocytomas and infratentorial gliomas. MGMT-methylation was determinated by methylation specific PCR (MS-PCR). We analyzed overall survival and disease-free survival (free-progression and free-recurrence radiological survival). Statistics analysis was estimated with the Kaplan-Meier method. P-values <0.05 considered significant.

Results: 89 patients. Mean age 59.64 years (28-79). 55.1% men. 71 grade IV and 18 grade III tumours (97.8% primary). Karnofsky mean 80.90% (40-100). Karnofsky mode (40% of patients)=90%. 28.1% were biopsies, 69.7% partial resections and 6.7% complete resections. Complete chemotherapy was administred to 74.2% and complete RT3D (59.4 Gy/33sesions) to 83.1% of patients. OS mean was 22.06 months (4-42) for grade III and 11.03 (1-31) for grade IV. FS mean was 17 months (2-35) for grade III and 9.38 (1-30) for grade IV. 66 were exitus at the end of this study. MGMT-methylation showed significant impact on patients OS (p=0.023). However, we did not find between this molecular marker and FS (p=0.199).

Conclusions: In our study, MGMT- promoter methylation is associated with OS but not with FS. Variable resonance image schedules or low sensibility of these image studies may underline the lake of correlation between the presence of this molecular marker and FS.

MULTICENTRIC GLIOBLASTOMA MULTIFORME: A CASE REPORT

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Introduction: Multicentric glioblastomas (MGBM) which arise in supra/infratentorial regions are uncommon lesions. Brain imaging test and, in most cases, a biopsy of the lesions are necessary for diagnosis. Their management remains controversial and their prognosis is unfavorable.

Case presentation: The authors present a case of MGBM in a 33 year-old man presented with a two-weeks history of headache. Computer tomography (CT) and magnetic resonance (MR) images showed multiples supra and infratentorial lesions. Microbiologic studies were negative and may rule out infectious diseases. A total body CT ruled out the diagnosis of cerebral metastases. The patient underwent a parietal craniotomy and biopsy of the left parietal lesion. The histopatological diagnosis was glioblastoma multiforme. Adjuvant therapy was given with whole-brain radiotherapy (40 Gy) and concurrent temozolomide. Tolerance to treatment was good. One month after the adjuvant treatment, a control cranial MR was done. MR disclosed signs of tumor growth progression and signs of leptomeningeal dissemination. The patient presented cervical pain and right hemisensory. The study was completed with a spinal MR confirmed spinal leptomeningeal dissemination.

Conclusions: In this paper, we report a case of MGBM. The patient presented craniospinal leptomeningeal dissemination one month after adjuvant treatment. Few cases have been previously reported in the literature. MGBM should be considered in the differential diagnosis of multiple brain lesions. The management of these patients is controversial. Currently, there is no specific treatment protocol for MGBM. They are usually treated similarly to glioblastomas with single lesion. The prognosis remains unfavorable.

MULTIDISCIPLINARY INTEGRAL APPROACH OF PATIENT WITH BREAKTHROUGH CANCER PAIN

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Objectives: Breakthrough cancer pain (BTcP) is a common symptom that contributes substantially to the suffering experienced by cancer patients, however, it is often unrecognized and undertreated. We aim to discuss the clinical characteristics of BTcP and provide practical strategies for managing it effectively.

Methods: A multidisciplinary panel of experts met to establish the actual knowledge on BTcP. The panel defined 36 key questions that were answered according to the best evidence and their experience.

Results: Topics covered by the panel included the definition, prevalence, diagnosis, treatment and multi-disciplinary management of BTcP. A precise pain assessment is essential to identify all the areas of impact on patients' quality of life and to plan the most appropriate treatment. BTcP requires a combination of management strategies and a multidisciplinary approach, which may include pharmacological and non-pharmacological treatments. The ideal pharmacological treatment for BTCP episodes must have pharmacokinetic properties that closely match the temporal characteristics of a BTcP episode, mainly a rapid onset of action and a relatively short duration of action. In addition, it must be potent, non-invasive, simple to administer, have minimal side effects and be cost-effective. Rapid-onset transmucosal fentanyl preparations are the drugs most fitting to the analgesic needs of BTcP. Collaboration between health providers, patients and carers represents an essential component of the management of BTcP.

Conclusion: This document provides an overview of the clinical characteristics of BTcP and provides practical strategies for a better diagnose and treatment.

MULTISESSION CYBERKNIFE RADIOSURGERY FOR OPTIC NERVE SHEATH MENINGIOMA. CASE REPORT

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Objective: To evaluate the effectiveness and safety of multisession radiosurgery with Cyberknife for optic nerve sheath meningioma (ONSM).

Patient and methods: In June 2014, a 37 years old female patient, with ONSM presenting with visual field deficit and loss of visual acuity, was treated with staged CyberKnife radiosurgery. We used a thermoplastic mask as immobilization device and a planning CT and an MRI to accurately delineate the planning target volume (PTV) and organs at risk. The developed treatment plan covered 96.44% of the PTV and the treatment was delivered in 5 fractions of 5 Gy in 10 days to a total dose of 25 Gy prescribed to the 87% isodose line. Visual acuity and visual fields were assessed immediately prior to treatment and at intervals of 3 months thereafter. Follow-up MRIs were performed every 3 months.

Results: The pretreatment tumor volume was 22.10 mm^3. Treatment time was 25 minutes per fraction and tolerance was adequate. The follow-up with MRI has not shown OSNM progression and the visual function loss has stabilized. Acute toxicity was temporary blurred vision treated with a short course of dexamethasone. No other acute or late radiation-induced toxicities were observed, during the 9 months follow up.

Conclusions: Multisession radiosurgery with CyberKnife is safe and effective at preserving vision. For tumors close to the optic pathway (<2 mm from optic nerve) where single fraction radiosurgery might be not safe enough to preserve visual function, fractionated radiosurgery is highly recommended.

NEURAL INVASION IN PATIENTS WITH SKULL BASE BONE METASTASES

Vargas, A.; Paulazo, C.; Valduvieco, I.; Oleaga, L.; Verger, E.

Objectives and purpose: Review clinical features of Skull base bone metastases (SkBBM) and assess its correlation with radiological findings.

Patients and methods: We evaluated 14 cases of SkBBM from primary solid tumours in a period of two years (2012-2014), Male: Female proportion was 1:1. All patients were identified by Magnetic Nuclear Image (MRI) and/or Computed tomography (CT). We reviewed clinical presentation and radiological findings.

Results: Prostate and breast were the most frequent primaries in male (4/7 pts) and female (6/7 pts) respectively. Overall, breast cancer was most frequent (6/14 pts). The most common site of SkBBM was Clivus (7/14 pts). Mean time between primary tumor diagnosis and SkBBM demonstration was 28.67 months (0-154). Symptoms were present in 11/14 pts (78.6%). One patient had headache and 10 (90.9%) had signs of cranial nerve (CN) involvement. Three were asymptomatic. Facial paresthesia was the most common symptom and Trigeminal nerve was the most frequently affected (6/10 pts). MRI and CT figure out bone metastases and CN involvement in 7/10 pts with clinical signs, in the other 3 pts just bone metastases were seen. In 7/10 patients laterality of signs had a clear radiographic correlation. In the other 3 patients radiologic image and location of SkBM did not explain completely signs and symptoms regarding nerve involvement.

Conclusions: Neurological signs are present in the majority of patients with SkBBM. In patients with clinical involvement of CN, neural invasion besides bone metastasis is seen in MRI or CT. Clivus was the most frequent site of SkBM.

OUR EXPERIENCE IN THE TREATMENT OF VESTIBULAR SCHWANNOMAS

Fortes de la Torre, I.; Pérez Gómez, R.; Villanueva Álvarez, A.; López García, M.P.; Moreno Sáiz, C.; Iglesias Moroño, S.; Márquez Márquez, B.; Herruzo Cabrera, I.

Introduction: Vestibular schwannomas (VS), also known as acoustic neuromas, are benign tumors, which originate from abnormal growth and proliferation of Schwann cells surrounding the vestibular division of the eighth cranial nerve. They develop in the vestibular branch of the eighth cranial nerve in the internal auditory canal or cerebellopontine angle. The clinical progression of the condition involves slow and progressive growth (1-2 mm per year), eventually resulting in brainstem compression. Its incidence is 1/100000 inhabitants. 95% are unilateral and sporadic.

Objectives: To study the transient and persistent acute complications in the first 2 years after radiosurgery (RS). Toxicities were graded by the Radiation Therapy Oncology Group Acute/Late Radiation Morbidity Scoring Criteria. To assess changes in tumor size in the first 2 years after RS. To determine the correlation between different variables and the occurrence of complications.

Methods and materials: We retrospectively analyzed the data of 40 patients with diagnoses of VS treated with RS between 2010 and 2013, excluding cases of neurofibromatosis.

Results: Of the 40 patients, none experienced a Grade 3 or 4 toxicity. Acute toxicity: tinnitus (20%), headaches, gait instability and dizziness. 29% of patients have long-term complications (with latency of months to years after RS). After a median radiographic follow-up of 24 months, 95% tumors were smaller or stable, and 5% had evidence of progression.

Conclusions: These results suggest that linac SRS provides excellent short-term tumor control rates. Some patients will develop complications; these are likely to decrease as institutional experience matures.

OUTCOMES OF LINAC RADIOSURGERY TREATMENT FOR BRAIN METASTASES

Errasti, M.; Rico, M.; Barrado, M.; Campo, M.; Visus, I.; Navarrete, P.; Asín, G.; Martínez, E.G.

Purpose: We retrospectively review our patients treated with RS Linac for BMs from 2010 to 2014.

Material and methods: 48 patients, median age was 59 years, 70 lesions treated. Predominant histologies included: non small cell lung cancer (24 patients), breast cancer (6), colo-rectal (5). 16 patients treated with RS alone, 27 RS plus WBRT, 1 with RS plus neurosurgical resection (NSG), 4 with RS plus NSG plus WBRT. 12 metastases were treated to 15-16 Gy, 17 to 18 Gy and 41 received doses between 20-24 Gy. We analyze median overall survival (mOS) according to RPA-RTOG classes, median loco-regional progression free survival (mLRPFS) and mOS according to the treatment and median local progression free survival (mLPFS) attending to the immobilization system, and doses prescribed.

Results: With a median follow up of 6 months (1-28 m), mOS was 7 months. mOS among patients belonging to RPA-RTOG class I, III and III was 10, 7 and 2 months respectively ($p>0.05$). mLRPFS for patients following RS alone was 5 months; 9 for RS+WBRT (NSS). mOS was 6 and 7 months respectively. mLPFS with head frame was 9 months, 6 for those who used frameless (NSS). No difference in local control between lesions receiving 20 Gy or more and those receiving less.

Conclusions: Our results are consistent with data already published. RS+WBRT improve loco-regional control in selected patients, RPA class 1 and 2, with nonsignificant OS benefit. Stereotactic head frame may improve mLPS. Results weren´t statistically significant, higher recruitment is needed.

PARTICIPATION OF OUR INSTITUTION IN GLIOMAT PROJECT

Arregui López, E.; Pérez Beteta, J.; Pérez García, V. M.; Morera López, R.

Introduction: Gliomas are the most common type of primary brain tumors and high-grade represent a very high percentage. In recent years it has made significant progress in the description of the phenomena of tumor growth by evolutionary mathematical models and in particular, have developed many mathematical models reproducing the progression of high-grade gliomas.

Objectives: Study of the correlation between the width of the ring catchment contrast 3D images T1 + Gd and, patient survival and the response to different therapies. Analize the irregularity of the outer surface of the ring and necrosis area and, the possible correlation with response to therapy and survival.

Material and methods: This retrospective, multicenter study that analyzes about 200 patients with glioblastoma, of which over 100 are patients treated at our center. A semiautomatic segmentation of DICOM MR images in T1+GD is done to determine the area that captures contrast and necrosis using the mathematical image processing. Then, reconstructs 3D area that captures contrast and necrosis by a specific script, obtaining quantitative values that correlate with clinical and patient survival variables.

Preliminary results: Some characteristic values are calculated geometry of the tumor. We calculated three measures related to the width of this ring: spherical average, maximum and average width. We have outstanding phase correlate these measurements with clinical data and patient survival.

Conclusions: The study is preliminary to later obtain quantitative values of the relevant variables. After this stage, we will proceed to mathematical analysis after which we hope to obtain conclusive results.

PERCENTAGE OF MGMT GENE PROMOTER METHYLATION

Paredes Rubio, S.; Laria Font, C.; Castaño Zuleta, F.A.; Corral Delgado, S.; Sota, P.; Aguas, J.; Mozas, P.; Pujol, E.; López Mata, M.; Bellosta Ferrer, R.

Introduction: MGMT promoter methylation in high-grade gliomas is a predictor factor of treatment with temozolomide response. This test has been performed in our hospital since January 2014.

Objective: Determine the percentage of MGMT gene promoter methylation in patients diagnosed with high-grade glioma and treated with surgery in our hospital, and correlate with treatment response.

Material and methods: The methylation percentage was determined in patients diagnosed with high-grade gliomas by the PCR technique specific for MGMT gene promoter and pyrosequencing reaction. All patients underwent surgery and started QT- RT treatment according to Stupp protocol.

Results: We analyzed 34 patients diagnosed with high-grade gliomas (29 GBM and 5 AA), with average age of 59.15 (34-85) and 70.6% of males. 32.4% of the patients were performed a biopsy, 14.7% partial resection, 41.2% subtotal resection and 11.8% complete resection. The cut-off percentage for MGMT promoter methylation has been taken as 25% and it was found out that 38.23% were methylation negative (3.6-23.6) and 61.77% were positive (29-75.8). Among those with negative methylation, the mortality rate was 69.2%, while in positive methylation patients was 38.1%.

Conclusions: The mortality rate among patients with a percentage methylation of MGMT promoter below 25% seems to be higher in comparison with positive methylation group. However, more patients should be recruited as well as a longer follow-up in order to obtain a correlation between the percentage of MGMT promoter methylation and treatment response and assess its usefulness in clinical practice.

PERFUSION CT IN HIGH GRADE GLIOMAS TREATED WITH RADIATION THERAPY

García Gómez, R.; Casillas Meléndez, C.; Conde Moreno, A. J.; Ortiz Rodil, N.; Albert Antequera, M.; García Piñón, F.; De las Peñas Bataller, R.; Ferrer Albiach, C.

Introduction: Monitoring and response evaluation to treatment of high-grade gliomas (HGG) is performed with multiparametric magnetic resonance imaging. Perfusion computed tomography (pCT) shows linear relation between density changes and tissue concentration of contrast medium. pCT renders essential information about tumor vascularisation and blood-brain barrier disruption.

Objective: Our aim is to assess early changes in perfusion parameters with pCT in patients with HGG treated with external radiation therapy (ERT).

Material and methods: We prospectively analyzed 11 patients with 12 HGG partially resected and treated with chemotherapy and ERT. Three pCT (basal, 4-weeks from the begining of ERT and a 1-month after the end of ERT) were performed in all patients, using 128-detector row CT with adaptive 4D spiral mode. Parametric cerebral blood volume (CBV), cerebral blood flow (CBF) and permeability maps were analyzed. CBV, CBF and volume transfer coefficient (Ktrans) data were quantitatively analyzed with commercially available 3D perfusion software.

Results: In 4-weeks pCT 4 and 5 lesions showed CBV and CBF increase, respectively. Conversely, there was a Ktrans decrease in 8 lesions, depicting a drop in permeability. In 1-month pCT all lesions presented a reduction in CBV and CBF, except in 1, which progressed on 3-months MRI. Two patients showed Ktrans increase in the 1-month pCT, progressing on 3-months MRI.

Conclusion: Most HGG show a Ktrans decrease at the middle of ERT. No-decrease in CVB and CBF or Ktrans increase, a month after ending ERT, may indicate a poor response.

PREOPERATIVE RADIOTHERAPY IN SOFT TISSUE SARCOMAS: TWO CASE REPORTS

Garcia Anaya, M.J.; Zapata Martinez, I.; Correa Generoso, R.; Toledo Serrano, M.D.; Garcia Rios, I.; Román Jobacho, A.; Otero Romero, A.; Ordoñez Marmolejo, R.; Perez Rozas, A.; Medina Carmona, J.A.

Purpose: To evaluate the acute toxicity and response tumoral in patients with soft tissue sarcomas treated with preoperative radiotherapy (RT).

Material and methods: Retrospective review of two patients treated in our department with preoperative radiotherapy and surgery. A 42-year-old male diagnosed myxoid liposarcoma. The tumor was located under muscle previous tibial in the left lower limb. And a 62-year-old male diagnoses mass of the vastus externus of the right lower limb. A MRI and a core needle biopsy were performed, and the histological diagnosis was apleomorphic liposarcoma. Planning was done with fusion of CT and MRI images. Both patients were treated with preoperative RT. The prescribed dose was 50 Gy in 2 Gy fractions. Subsequently underwent limb-sparing surgery.

Results: Patients had no acute toxicity during treatment. The specimen was sent to pathology. In the first case the pathology examination revealed a tumor specimen of 13 cm, with only 2% of residual tumor, while in the second case reported tumor of 14 cm with 7% of residual tumor.

Conclusions: The combination of RT and limb-sparing surgery achieves better local control than radical surgery. Efficacy is similar using preoperative or postoperative RT. Preoperative RT is associated with a greater risk of reversible wound complications than postoperative radiotherapy; however, chronic complications are more common in postoperative RT. In our experience preoperative RT is well tolerated with very few acute complications. We prefer preoperative RT for most patients given that acute wound complications can usually be managed, while late treatment effects are generally irreversible.

PRE-SURGICAL 3D CONFORMED RADIATION IN THE TREATMENT OF MENINGIOMAS: CASE REPORT

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Introduction: Depending on their degree of vascularization, surgery of some meningiomas can represent an important risk due to surgical bleeding, so technical efforts to de decrease blood supply are often used, endovascular embolization being the most standarized of them. Even though this technique has demonstrated a high level of effectiveness, it is not exempt from complications and it is not avalaible in all centres. Pre-surgical conformed RT3D could be a valid alternative even when it has not been described in the literature. A case of a patient operated on for a meningioma treated with this technique is reported.

Material and methods: A 40 year old female requested a consultation because of a secondly generalized partial motor seizure. The imaging study demonstrated a huge sphenoid wing meningioma highly suplied by arterial vessels. Prior to surgery she was treated with RT3D (DT=50 Gy/2 Gy fx/25 s) with segments and imaging fusion.

Results: 1,5 months later surgery was carried out, with 14 hours duration and the need for 1,5 erythrocytes concentrated units, without haemodynamic instability nor other eventualities. A gross total resection was achieved. The patient presented a pseudomeningocele as a complication, which was treated with a dural plastia and a spinal drainage with a satisfactory resolution.

Conclusion: Prior to surgery-comformed RT3D could be a valid alternative in the treatment of meningiomas aimed to facilitate the surgical technique and decrease blood supply during it. A cause-effect relationship between pseudomeningocele and radiation was not found. No other similar case has been reported in the reviwed literature.

QUALITY OF LIFE ASSOCIATES WITH SURVIVAL IN LUNG CANCER PATIENTS

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Purpose: This study aimed to investigate the correlations among patient, tumor, pre-radiation therapy (RT) treatment factors, and the outcome with the global health status (GHS) and functional scales scores reported by lung cancer (LC) patients before RT.

Methods: We conducted a prospective multicentric study with a quality-of-life (QOL) survey on 171 LC patients just before starting RT. QOL was assessed using the EORTC-QLQ-C30 (v3.0) questionnaire and GHS, physical (PF), role (RF), emotional (EF), cognitive (CF), and social functioning (SF) scores were evaluated. Several patient factors (i.e. age, sex, etc), tumor features (histology, stage), and other treatments before RT were considered for the analysis.

Results: The median age at diagnosis was 63 years (range, 35-89). The TNM classification was as follows: 7 I, 18 II, 129 III, and 17 IV. The median GHS, PF, RF, EF, CF, and SF scores for the entire group of patients were 58%, 73%, 66%, 75%, 83%, and 83%, respectively. In the multivariate analysis, patients losing weight prior to beginning RT reported lower GHS scores (OR: 0.42; CI: 0.22-0.79; p=0.007) and PF (OR: 0.41; CI: 0.22-0.76; p=0.005). In terms of SF, patients reporting higher SF scores before treatment had a lower risk of mortality (OR: 0.20; CI: 0.42-0.95; p=0.043) and relapse (OR: 0.30; CI: 0.10-0.88; p=0.029). In addition, patients with non-adenocarcinoma LC reported lower SF (OR: 0.31; CI: 0.14-0.71; p=0.005). Finally, patients who had induction chemotherapy reported higher EF scores (OR: 2.00; CI:1.06-3.77; p=0.031).

Conclusions: Pre-RT QOL assessment associates with outcome in LC patients. This information may be us.

RADIATION THERAPY IN BRAINSTEM TUMORS WITHOUT BIOPSY TO DEFINITIVE DIAGNOSES

De la Pinta Alonso, C.; Hernánz De Lucas, R.; Fernández Lizarbe, E.; Ramos Aguerri, A.

Background and purpose: Brainstem gliomas are rare diseases in adults accounting, about 2% of all intracranial neoplasms. Often, brainstem tumors are low-grade gliomas. Brainstem biopsies are rarely performed. We evaluated the experience of the treatment of brainstem tumors without biopsy.

Patients and methods: 9 patients were diagnosed brainstem tumors in our Hospital (between January 2010-December 2014). Three patients undergo surgery and treatment with radiation therapy was not administered. Six patients were treated with radiation therapy exclusively. These patients had not biopsy diagnose. The magnetic resonance imagining was diagnostic, this method of diagnostic suggested gliomas as primary option in these patients. The symptoms was headache (3 p), instability (2 p), sensivity reduction (3 p), hiccup, double vision and vomiting (1 p).

Results: Medium age was 45 years (range 25-60). Gender was 83% male and 17% female. Dose of radiation therapy was 54 Gy (1.8 Gy per fraction). Two patients died due to other causes different them tumor. Four patients had good treatment reponse with lesion stability at this moment. The patients have good performance status, without important toxicities. The patients showed a significant decrease in symptoms. In this moment patients are clinical stability with a median follow up of 20 months (4-50 months). Median overall survival in all patients was 27 months (11-50 months).

Conclusion: In brainstem tumors, the biopsy is difficult and it could have important consequences. With radiologic diagnosed, biopsy is not necessary to treat this kind of tumors. The radiation therapy is a good treatment option in relation to improve the local control with not important toxicities.

RADIATION THERAPY OF THE SURGICAL BED OF BRAIN METASTASIS

Valtueña Peydro, G.; Olarte-García, A.; Martinez Fernandez, M.I.; Guridi Legarra, J.; Díaz-Valle, R.; Moreno Jimenez, M.; Legaspi Folgueira, J.; Aristu Mendioroz, J.J.

Introduction: Radiation therapy of the surgical bed without WBRT is a new treatment approach of BM. We analyze the patterns of recurrence in patients treated in our institution with this treatment secuence.

Methods: Brain surgery was indicated if the BM had ≥3 cm of max diameter or the presence of neurological symptoms. Radiation therapy techniques were SRS (15 Gy) or SRT (26 Gy-52 Gy in 5-20 fx).

Results: Between May'08 and December'14, 24 patients with a median age of 54.5 years, were included. More frequently primary tumor diagnosis was lung adenocarcinoma (37.5%). The mean GPA index was 3. In 23 (96%) of BM a gross total resection was performed and in 1 (4%) patient underwent subtotal resection. Four (16.6%) and 20 (83.3%) received SRS/SRT, respectively. No patient had postoperative neurological complications or acute adverse effects. No relevant late adverse effects was observed. Five patients (20.8%) presented local recurrence, 1 (4.1%) marginal and 8 (33.3%) distant failure. Only 2 patients died by brain progression (carcinomatosis) and neurological death was not observed. With a MFU of 19 months, the local control rate in 23 patients who underwent complete resection was 82%. The median OS and brain PFS were 30 months and 24 months, respectively.

Conclusions: Unfovourable BM treated with surgical resection and SRS/SRT of the surgical bed is feasible. Local Control and PFS rates were acceptable taking into account the poor prognosis of this group of patients. Pattern of recurrence was predominantly distal without detriment in OS rates or neurological impairment.

RADIONECROSIS IN BRAIN METASTASES AFTER WHOLE BRAIN RADIOTHERAPY PLUS RADIOSURGERY

Marcos, S.; Belinchón, B.; Lozano, E.; Caballero, P.; Sotoca, A.; Vázquez, G.; Simón, R.; Huete, N.; Pérez, S.; Martínez, N.

Objective: Delayed toxicity after whole brain radiation therapy (WBRT) is of increasing concern in long-term survivors with brain metastases from breast cancer. Radionecrosis is detected by magnetic resonance imaging (MRI) and has been correlated with neurological dysfunction. This case describes the risk of developing radionecrosis in a breast cancer patient who underwent WBRT plus stereotactic radiosurgery (SRS).

Patient and methods: In 1998, a 41 years old female patient was diagnosed invasive lobular carcinoma (pT1pN1M0) of the right breast. She was treated with modified radical mastectomy, adjuvant chemotherapy, radiotherapy and hormone therapy. After 11 years, she was diagnosed infiltrating ductal carcinoma (pT1pN0M0) of the contralateral breast. She was treated with modified radical mastectomy, adjuvant chemotherapy, trastuzumab and hormone therapy. In 2011, the patient reported unsteady gait. MRI presented a single temporal brain metastases. She underwent WBRT (30 Gy in 10 fractions) plus CyberKnife radiosurgery (18 Gy in 2 fractions). After 3 years, MRI presented 2 new temporal and frontal brain metastases and underwent Gammaknife radiosurgery (17 and 18 Gy single session).

Results: 6 months after Gammaknife radiosurgery, MRI and PET ^{18}F-FDG showed a new temporal lesion. Histological study was consistent with radiation necrosis. Late toxicity impaired recent memory. No other acute or late radiation induced toxicities were observed.

Conclusion: WBRT might increase the risk of central nervous system toxicity in long-term survivor breast cancer patients with single or few brain metastases which can be treated with SRS alone.

RADIOSURGERY AS RESCUE TREATMENT IN HIGH-GRADE GLIOMAS 20 YEARS EXPERIENCE

Velazquez-Pacheco, A.; Sallabanda, K.; Garcia, G.; Peraza, C.; Samblas, J.

Objectives and purpose: The aim of this study is to analyze our experience using radiosurgery (RS) as rescue treatment in high-grade gliomas.

Material and methods: Clinical data from 48 patients with gliomas grade III-IV was collected across 1991 to 2012 with at least one year of follow-up.

Results: Fifty-four lesions in 48 patients were analyzed, mean age was 48.4 years, 29.2% was women and 70.8% men. Mean follow-up was 55 months. The main localization was frontal and parietal in 58%. The most common histologies were Anaplasic astrocytoma (54.2%), Glioblastoma (37.5%) and Anaplasic oligodendroglioma (6.2%). In 97.9% of cases surgery was done as primary treatment with GRT in 30% and STR 27%. All patients received EBRT and in 3 patients was used IOR, chemotherapy was performed in 64.6%. Mean time to RS was 17.6 months (1.6-116 mo.). Mean dose was 12 Gy (6-20 Gy) to mean isodose 90% (50-10%). Clinically 64.6% of cases developed improvement or stable disease (SD) with decrease in neurological symptoms. Radiologically 46.3% of lesions developed reduction or SD. Only 5 patients developed radionecrosis. 2-year and 5-year OS were 71%

and 38.8% respectively. OS since RS to 1-year 64.3%, 2-year 38.6% and 3-year 27%.

Conclusions: Radiosurgery is a treatment to be considered within the multidisciplinary management of high-grade gliomas. In our study clinical improvement existed, low toxicity profile and prolong survival after relapse. It's necessary to identify subgroups of patients according clinical, pathological and image factors that would most benefit.

RADIOSURGERY FOR BRAIN METASTASES WITHOUT INITIAL WHOLE BRAIN RADIATION

Larrea, L.; López, A.; Antonini, P.; González, V.; Baños, M.C.; Bea, J.

Purpose and objectives: Review our experience with linear accelerator-based stereotactic radiosurgery (SRS) for the treatment of patients with brain metastases (BM) without initial whole brain irradiation (WBRT).

Material and methods: Patient records and imaging studies of all patients who underwent SRS for BM between 2004 and 2014 were analyzed. Patient demographics, tumor characteristics, treatment factors and outcomes were evaluated. Overall survival (OS) was calculated from the date of first SRS. Treatment related toxicities were graded according to RTOG-scores.

Results: 159 patients were treated in 196 SRS procedures for 330 BM. Mean marginal SRS dose was 14.87 Gy (10-15). Mean time between successive SRS in the same patient was 11 months (6-28). Twenty-three (14.4%) patients required posterior WBRT: 19 patients for progressive disease and 4 patients as part of the initial treatment plan. 106 patients continued follow-up in our institution, of those 78 had at least 6 months' follow-up (6-56), with median OS: 17 months. Different median OS were observed according to: presence or absence of extra cranial metastases at the time of SRS (6 vs 20.6 months), addition or not of WBRT (12 vs 18 months) and primary tumor location (7.5, 18.8 and 12 months for lung, breast and others, respectively).There were no toxicities > grade 3.

Conclusions: SRS is a safe and effective initial treatment for BM, producing high local control with low toxicities. Other advantages of SRS include possibility of WBRT afterwards and feasibility to initiate systemic treatment without delays.

RADIOTHERAPY FOR PAPILLARY TUMORS OF THE PINEAL REGION: A CASE REPORT

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Introduction: Papillary tumor of the pineal region is a neuroectodermal tumor thought to be derived from cells of the subcommissural organ. This entity was first described in 2003 and subsequently included in the WHO classification of CNS tumors in 2007. This rare tumor has been described in fewer than 100 cases.

Case report: We report a 46 years old male who complains of a reduction of the visual acuity. MRI showed a heterogeneous tumor in the third ventricle, solid with cystic/necrotic component (3.2×3.2×3 cm) in the pineal gland. He was operated in January 2013 and a 90% of the tumor was succesfully removed. The pathologic examination revealed a papillary tumor of the pineal region. The patient was treated with external beam radiation therapy (6MV photons to an eighth-field conformal technique) to a dose of 45 Gy (1.8 Gy/fraction, 5 fractions/week) of the third ventricle, lateral ventricles and residual tumor, and additional 10.6 Gy of the residual tumor. Residual tumor measured 26×14×23 mm and 8 months after radiotherapy it measured 8 mm. MRI showed no evidence of growth one year later.

Discussion: In a quite extensive retrospective multicenter study of 44 cases, the statistical analysis showed that the extent of the surgery was the only clinical factor associated with a better overall survival. Radiotherapy did not influence the overall survival nor progression-free survival. This analysis proved chemotherapy also ineffective. Prospective studies are required to analyze the role of radiotherapy, more particularly after incomplete resection or when surgery cannot be performed.

RADIOTHERAPY IN MENINGEAL HEMANGIOPERICYTOMA. EXPERIENCE IN OUR CENTER

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Background: Hemangiopericytomas are rare tumors that behave aggressively with a high rate of local recurrence and distant metastases. The objective is to evaluate the treatment outcomes of patients with meningeal hemangiopericytoma in our center, to define the role of radiotherapy in the management of the disease.

Material and methods: A retrospective analysis of all patients diagnosed with hemangiopericytoma between 1997 and 2013 and treated with resection plus radiation. Fractionated Stereotactic Radiotherapy, dose 60 Gy/1.8 Gy plus a boost radiosurgery, dose 18 Gy. For this we used the SPSS statistical program.

Results: We have treated 4 patients with a median of age of 53 years. The main presenting symptoms were headache and loss of strength and lower extremity paresthesias in 100% of the patients and visual disturbances in 50% of the patients. As for the answer to the treatment there were 4 complete responses. Two patients experienced a local recurrence, which were treated with radiosurgery. Currently, all patients are alive and have no evidence of disease. The median of disease free-survival was 4 years, and the median of overall survival of 8 years, with a follow-up of 10 years.

Conclusions: Based on literature review and the patterns of failure in our small series, complete resection followed by adjuvant radiotherapy of more than 60 Gy represent a reasonable approach for the initial management o M-HPC. Radiosurgery is indicated for recurrent tumours measuring less than 30 mm.

REIRRADIATION AFTER SECOND LINE TREATMENT IN RECURRENT HIGH GRADE GLIOMA

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First line treatment for High Grade Gliomas is perfectly established since the publication of Stupp in 2005. In recurrences, we don´t have a standard therapy, but with several phase 2 studies based on the use of bevacizumab alone or in combination with CPT-11, we have a new therapeutic option that, although not without toxicity, appears to have encouraging results. We describe our experience with the association of radiotherapy in patients with partial response to second line treatment. We included patients with a diagnosis of recurrence of high grade glioma histologically proven treated with the combination of bevacizumab and CPT-11 with partial response or stable disease followed by radiotherapy as reirradiation after Stupp scheme. All of them were no resectable disease and with a performance status between 0-1.

Results: From 2008 to February 2015, 25 patients aged between 31 and 66 were included. Most of them were primary glioblastoma, one anaplastic astrocytoma, one gliosarcoma and one anaplastic oligoastrocytoma. We obtained 2 complete response in well-tolerated treatment, 2 toxic deaths and 8 deaths due to progression of the disease without receiving radiotherapy. Remaining patients received radiotherapy with IMRT technique or Tomotherapy to 60 Gy, 2 Gy per fraction, obtaining stable disease with a median of 6 months until progression and 2 patients that still in response after 14 months from treatment. All patients delivered grade 1 acute toxicity.

Conclusions: The response to combination therapy makes us feel optimistic, but the selection of patients must be carefully. CNS reirradiation should be administered with advanced radiotherapy techniques.

RELATIONSHIP BETWEEN SUBVENTRICULAR ZONE DOSE AND SURVIVAL IN PATIENTS WITH GLIOBLASTOMA MULTIFORME TREATED WITH SURGERY FOLLOWED RADIO-CHEMOTHERAPY

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Purpose: To determine if there be relationship between dose of subventricular zone and survival in patients with glioblastoma treated with surgery followed radio-chemotherapy.

Material and methods: Between 2006 and 2013, we study retrospectively 53 patients with glioblastoma multiple treated with surgery followed by radio-chemotherapy. The relationships between subventricular zone doses (SVZ), progression free survival (PFS) and overall survival (OS) were examined using Cox proportional hazards models. The covariates to estimate their impact were: sex, age, localitation, surgery, adjuvant temozolomide, MGMT status.

Results: The median age was 68 (84-30) years, 58.1% were men, the localitation of tumors were distributed equally in both hemispheres, biopsy was performed in 9.4%, subtotal resection at 52.8% and total resection at 37.7%, 43.2% of patients MGMT gene promoter was methylated. Median PFS and OS was 9.5 (6.7-12.3) and 15.8 (11.8-19-8) months respectively. The median dose to the ipsilateral, contralateral, and bilateral SVZ was 52.2 [41.7, 57.5], 43.1 [31.6, 51] and 47.2 [37.5, 54.3] Gy respectively. The OS was higher in patients receiving ≥51 Gy in the contralateral SVZ (p=0.012); adjusted HR=0.195 [95% IC, 0.055-0.697] and those that surgical resection was performed (p=0.037); adjusted HR=0.100 [95% IC, 0.012-0.870] respectively. Also these variables were associated with PFS, higher doses in the contralateral SVZ (p=0.002) adjusted HR=0.112 [95% IC=0.029-0.439] and surgical reseccion (p=0.002) adjusted HR=0.021 [95% IC=0.002-0.233]), were asociated with better PFS.

Conclusion: High-dose radiation in contralateral SVZ and surgical resection was associated with a significant improvement in PFS and OS in patients treated with surgery followed by radio chemotherapy for glioblastoma multiforme.

RENO TRIAL: EFFICACY AND SAFETY OF CT-RT CONCOMITANCE IN LA-NSCLC

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Objectives: The purpose of this multicenter randomized phase II trial is to evaluate the efficacy and safety of cisplatin with oral vinorelbine or etoposide concurrent thoracic radiation (RT) for locally advanced NSCLC (NSCLC-LA).

Methods: Patients (pts) between 18-75 years, with untreated and unresectable LA-NSCLC, adequate lung function, V20<35% and ECOG PS 0-1, were randomized 1:1 to: 2 cycles (cy) of oral vinorelbine-cisplatin (oVP) as induction, followed of 2 cy concurrent with 66 Gy of RT vs 2 cy of etoposide-cisplatin (EP) concurrent with 66 Gy of RT. The primary endpoint was progression free survival (PFS) using RECIST 1.1. Secondary endpoints were: overall response rate (ORR), overall survival and safety profile. Sixty-seven eligible pts per treatment arm were required to select better therapy with a type I error of 0.05 (one-tailed test), and a type II 0.1 (ß) error.

Results: 138 pts were included between 08/2011-11/2014. Forty-Six pts have been analyzed. Patient's characteristics were: male 91.3%; median age 64 (44-75); PS1 56.5%; smokers 46.8%; squamous 55.3%; stage IIIA 46.8%. The most common G3-4 toxicities for oVP/EP (cy) arms, in 118 cy analyzed, were: neutropenia 8.9%/13.1%; thrombocytopenia 0%/5.3%; febrile neutropenia 3 cases on oVP arm (during induction CT) and 1 case on EP arm; esophagitis/mucositis 1.3%/15.5%; infection 1.3%/5.1%. No treatment-related deaths were reported. Thirty-nine pts had completed the treatment. ORR was 73.7% in oVP arm and 50% in EP arm.

Conclusion: Preliminary results indicate that oVP has a better safety profile and a good clinical activity. Further follow-up with mature results are needed.

RISK AND PROGNOSIS FACTORS IN GLIOBLASTOMAS IN 104 PATIENTS

Arregui López, E.; Amo Salas, M.; Llumiguano Zaruma, C.; Rios Asus, P.; Morera López, R.

Purpose and objective: Glioblastoma (GB) is the most common and most aggressive malignant primary brain tumor in humans. Our objetive is analyze both the overall survival (OS) and progression-free survival (PFS) based on different potentially prognostic and risk factors.

Materials and methods: We have analyzed 104 patients diagnosed with GB in our center from between 2006 and 2013. Variables used include age, the diameter of the tumor at onset, different treatment schemes and the presence of necrosis.

Results: In terms of age, it was statistically significant for both the OS (p=0.0026) and the PFS (p=0.002). We did not see differences nor in the size of tumor at the diagnosis nor in the presence of necrosis. Patients who have made a complete treatment with STUPP scheme, have presented a OS of 17.2 months, while PFS was 10.9 months. In cases in which we have decided a palliative attitude, patients with surgery plus adjuvant radiotherapy presented better survival than those who only have been operated (8.5 vs 3.6 months). When patients were inoperable, performing palliative radiotherapy was more beneficial than no treatment, being the differences in both OS and PFS upcoming significance (p=0.072 and p=0.0719 respectively).

Conclusions: After analyzing our series, we see that the only prognostic factor is age. The OS nearly 18 months that present our patients treated with STUPP scheme is superior than in other series. We need to expand our database to improve both diagnosis and treatment.

RTOG-RPA GROUPS SURVIVAL FOR GLIOBLASTOMA. COMPARATIVE ANALYSIS BETWEEN TWO PERIODS

Mañas García, M.J.; Giraldo, A.; Micó, S.; Martinez Ricarte, F.; Maldonado, X.; Giralt, J.

Background: The RTOG-RPA groups have been adopted as a survival reference for clinical practice and research. In order to design

a survival reference baseline, we analyzed our experience in the case of high grade glioma (HGG) between two periods. We studied the outcome trends concerning the median survival time (MST).

Methods: From 2010 to 2014 we retrospectively reviewed the RPA clinical features (Age, Histology, Mental Status, KPS, Symptoms Time, Type of Surgery, Neurocognitive Function and Radiotherapy Dose) and calculated the MST (95%CI) for 105 HGG patients treated in our center. We classified them by RTOG-RPA classes. Then we compared survival results with those obtained in the period 1999 to 2006 and also with the validated RTOG MST for HGG.

Results: We included 239 patients into the MST analysis. For the 105 HGG treated 2010-2014, the mean age at diagnosis was 65.4 y (18-71 y), 90 men and 15 women. The histopathology diagnosis were anaplastic astrocytoma (AA) in 26 (24.76%) and glioblastoma multiforme (GBM) in 79 (75.23%). 40.9% had a Karnofsky Status of 90%. RTOG-RPA MST. There were no enough events in group II for analyses.

Conclusions: The classification of HGG patients in RTOG-RPA classes are consistent between periods with no temporal deviations. MST is according with RTOG validated publications. Despite the improvements in imaging, neurosurgery, radiotherapy and chemotherapy there were no trends in survival improvement.

SALVAGE RADIOSURGERY FOR SELECTED PATIENTS WITH RECURRENT MALIGNANT GLIOMAS

Tovar, I.; Martínez, M.; Zurita, M.; Del Moral, R.; Guerrero, R.; Saura, E.; Osorio, J.L.; Arrebola, J.P.; Expósito, J.

Purpose: To analyse the survival after salvage radiosurgery and to identify prognostic factors.

Methods: We retrospectively reviewed 87 consecutive patients, with recurrent high-grade glioma, that underwent stereotactic radiosurgery between 1997 and 2010. We evaluated the survival after initial diagnosis and after reirradiation. The prognostic factors were analysed by bivariate and multivariate Cox regression model.

Results: The median age was 48 years old. The primary histology included anaplastic astrocytoma (47%) and glioblastoma (53%). A margin dose of 18 Gy was administered in the majority of cases (74%).The median survival after initial diagnosis was 21 months (39 months for anaplastic astrocytoma and 18.5 months for glioblastoma) and after reirradiation it was 10 months (17 months for anaplastic astrocytoma and 7.5 months for glioblastoma). In the bivariate analyses, the prognostic factors significantly associated with survival after reirradiation were age, tumour and treatment volume at recurrence, recursive partitioning analyses classification, Karnofsky performance score, histology, and margin to the planning target volume. Only the last four showed significant association in the multivariate analyses.

Conclusion: Stereotactic radiosurgery is a safe and may be an effective treatment option for selected patients diagnosed with recurrent high-grade glioma. The identified prognostic factors could help individualise the treatment.

SINGLE BRAIN MASS IN CANCER PATIENTS: IS ALWAYS METASTASES?

Vargas, A.; Aya, F.; Valduvieco, I.; Verger, E.

Objectives and purpose: Review patients (pts) with known cancer and a single brain lesion in CT scan (CT). Assessed the correlation between CT and magnetic resonance image (MRI). Evaluate non metastatic brain lesions found in MRI.

Patients and methods: Retrospective review of 86 in-patients with brain metastases, assessed in a Radiation Oncology Department during a period of three years. All patients had neurological symptoms and known cancer. We analyzed patients with single brain image suspicious of metastasis in cranial CT scan. When MRI was performed, radiological diagnosis was compared with CT.

Results: In 41 pts (47.77%) a single brain lesion suspicious of metastasis was found in the CT. MRI was performed in 32 patients. In 9 pts MRI were not performed because poor Karnofsky Performance Status. When a MRI was performed, in 13 pts (40.6%) MRI confirmed the diagnosis of a Single Brain Metastases. But, in 14 cases (43.8%) was changed due to multiple brain metastases were found. In five patients (15.6%) the diagnostic of metastasis were excluded, the RM figured out other non cancer related diseases. The most frequent causes of no metastatic image had a vascular aetiology (4 patients). Stroke was the diagnosis in 2 of those.

Conclusions: Not all single brain lesions in a cancer patient are metastasis. In patients with known cancer and single brain image visualized by TC scan, differential diagnosis should be considered. In our sample, lesions of vascular aetiology are the most frequent. Stroke is the main condition to rule out

SINUS CAVERNOUS METASTASIS. A CASE REPORT

Bezares, A.B.; Serradilla, A.; Ramos, A.; Ristori, A.; Gomez, J.; Rivas, D.; Lazo, A.; Lopez, E.; Sacchetti, A.; Alvarez, D.

Introduction: Cranial metastasis from colon cancer are unusual, being more infrequent in cavernous sinus.

Objective: To describe a case of cavernous sinus metastasis from colon cancer.

Case report: Male 55 years diagnosed of colon adenocarcinoma with liver and bone involvement. He received palliative radiotherapy, chemotherapy and surgical fixation (level D5) and completed chemotherapy with partial response. He continued with Cetuximab and Zoledronic Acid. In August 2014 developed diplopia. Cranial MRI show metastatic infiltration of the left cavernous sinus. In October 2014 received fractionated stereotactic radiotherapy (42 Gy with fractionation 3 Gy/s). Treatment planning was performed using image fusion (CT and MRI with contrast). A relocable bucal fixation and thermoplastic mask was used for immobilization. Treatment was performed by Arc-therapy with dynamic multi leaf collimator (3 mm). Tolerance to treatment was good.

Discussion: Cranial metastases from colorectal carcinoma are rare. Clinically, the cavernous sinus interested because it contains the cranial nerves III to VI. Diagnosis is clinical (diplopia, dysesthesia, headache...) and radiological (CT and/or MRI). Treatment is palliative with a combination of chemotherapy and radiotherapy. Prognosis is poor with a median survival of 4 months.

Conclusions: There are few reports in the literature of cavernous sinus metastasis from colon cancer. Radiotherapy plays an important role and its prognosis is very poor. Our patient, five months later, has no diplopia and continues with chemotherapy.

STEREOTACTIC RADIOTHERAPY FOR VESTIBULAR SCHWANNOMA

Almendros Blanco, P.; Hernandez Machancoses, A.; Granero Cabañero, D.; Garcia Miragall, E.; Pastor Peidro, J.; Rosello Ferrando, J.; Garcia Hernandez, T.; Lopez Torrecilla, J.

Introduction and objective: To analyze patients (p) diagnosed with vestibular schwannoma (VS) treated with stereotactic radiotherapy, radiosurgery (RC) or fractional (RTEF), and to evaluate clinical and radiological results.

Material and methods: Between 04/2005 and 12/2014 55 p were treated with histological or radiological diagnosis of VS. Of these,

34 p (61.8%) male/21 p (38.2%)women; mean age 54.2 years (22-80). Average volume VS 4.35 cc (0.04-23.60), 52% were part-intracanalicular. The treatment was performed: 85% p exclusive/14.5% p adyuvant. RC was administered in 38 p (70.9%), medium dose 12.5 Gy (11-13.) and 17 p (29.1%) were treated with different RTEF schemas range 1.8-3 Gy/fx/5 fx and mean BED of 46.8 Gy (30-56.7), the chosen mode depended on size/location VS. Average following was 52 months (4-106). Follow-up was as clinical-assessment (cranial nerves VII-escale House-Brackmann/VIII-escale Gardner-Robertson) and radiological (tumor necrosis/tumor volume).

Results: Clinically, patients experienced improvement/cure symptoms: 36.4% dizziness/66.7% headache/31.6% inestability/40% tinnitus/34.6% paresthesias. Regarding hearing-loss remained 84.6% no-change/3.8% improved; VIIpar-involvement: 90.9% no-changed/3.6% improved/only 2 p worsened. Acute toxicity: 1 p (1.8% facial paralysis transitory), we found chronic toxicity in 32.7% p: highlighting hearing-loss 8p/hidrocefalia 2 p/headache 2 p/trigeminal-neuralgia 2 p/VII par-involvement 2 p. Patients with lesions ≥3.5 cc had higher clinical worsening and higher chronic toxicity index with no statistically significant difference. In patients treated with RC, average cochlea Dmax 12.2 Gy (3.9-15)/ Dmean 8.8 Gy (1.7-13.3), DMaxtrigeminal-nerve 10.6 Gy (4.3-13.8)/ Dmean 7.1 Gy (2-12), there was no relationship between hearing loss and dose-received in cochlea or appearance chronic-toxicity trigeminal-nerve and dose-received. Central-necrosis rate was 72.5%, no statistically significant differences RC/RTEF. Volume-lesion postRTE: smaller 60.4% p/stable 32% p/higher 7.5% p.

Conclusions: Results show that stereotactic radiotherapy is an optimal treatment in patients with VS, with good clinical and radiological results and acceptable toxicity and similar published in the literature. We recommend using RC/RTEF modality depending on the size and location of VS.

SURVIVAL AND LOCAL CONTROL IN GLIOBLASTOMA MULTIFORME: EXPERIENCE HUA-TXAGORRITXU

Trueba, I.; Pérez, J.F.; Fláquer, A.; Murúzabal, I.; Hortelano, E.; Poza, R.; Cobo, R.; Alía, A.

Introduction and objectives: The rates of overall survival and local control in glioblastoma multiforme (GM) are very low despite the combined treatments. It has been shown that factors as complete surgical resection, ECOG less than 2 and an age below 50 years are prognostic factors related to survival. Our goal is to perform a retrospective analysis of these parameters in patients diagnosed GM who were treated with radiotherapy in our center.

Methods: Statistical data analysis software IBM SPSS Statistics 22.0 was used. Between January 2004 and December 2011, 43 patients diagnosed with GM were treated with radiotherapy ± Temodal, either by surgical adjuvant treatment or as exclusive treatment in unresectable tumors. Of all patients, 39.53% corresponded to complete resections, 34.88% of patients had lower ECOG 2 and 13.95% were younger than 50 years. Likewise the 79.06% received concomitant Temodal with radiotherapy. All patients received external radiotherapy at doses between 30 Gy and 63 Gy with a fractionation between 1.8 and 3 Gy in the tumor. In 5 patients the treatment was suspended due to infection of the surgical wound or cognitive impairment.

Results: Overall survival rates at 12 and 24 months was 61% and 24.4% respectively and local control rates objectified by brain MRI were of 26,8% and 12.2%. The median of overall survival was 14.6 months (interquartile range 17.51) and local control rate was 6.9 months (interquartile range 9.74).

Conclusions: The data obtained confirm the poor results of the combined treatments in GM being comparable to those reported in the literature.

SURVIVAL AND PROGNOSTIC FACTORS IN GLIOBLASTOMA MULTIFORM, 189 PATIENTS EXPERIENCE

Feltes, N.; Alvarado-Astudillo, A.; Mur, E.; Folgar-Torres, A.; Fiol, B.; Maciá, M.; Solé, J.M.

Purpose and objectives: Glioblastoma Multiform (GBM) is the most common primary brain tumor in adults, is an aggressive malignancy with a poor outcome. Current standard of care for newly diagnosed GBM includes: surgery, concomitant and adjuvant radiotherapy and chemotherapy. The aim of this study was to investigate if the demonstrated improved survival in the literature is translated to our clinical practice.

Materials and methods: This is a retrospective study between June 1996 and December 2014, includes 189 patients with GBM. Median age: 61.9 years (24-87). 116 males (61.4%) and 73 females (38.6%). 63 patients (33.3%) received 2DCRT and 116 patients (61.4%) were treated with 3DCRT. Performance status (ECOG) 0=6.9%; 1=37%; 2=36%; 3=13%; NR=6.3%. The temporal lobe (40.7%) was the most common site affected, frontal 33.3%, parietal 17.5%, occipital 5.3%. Unilobar compromise: 63%, bilobar 29% and trilobar 6.9%. Right hemisphere affectation 50.8%, left 40.7 and bilateral 7.4%. 73 patients (38.6%) had complete tumor resection, 91 (48.1%) incomplete resection and 24 patients (12.7%) undergone biopsy only. 164 patients (86.8%) received chemotherapy: BCNU in 26 patients, Temozolamide adjuvant 11, Temozolamide concomitant and adjuvant in 127 patients.

Results: At present 163/189 patients are dead (86.2%), 14 alive with disease (7.4%), 5 alive without disease (4.8%). The mean overall survival (OS) was 18.6 months (95% C.I.: 15.7-21.4); median overall survival was 13.4 months (95% C.I.: 11.4-15.7); mean progression-free survival (PFS) was 13.5 months (95% C.I: 10.1-16.9) median progression-free survival was 7.8 months (95% C.I: 6.5-9.1) for the whole group. Factors identified as predictors of overall survival were: extent of resection, type of chemotherapy, number of lobes affected and ECOG Performance Status (all p=0.000 Long Rank). 3DCRT vs. 2DCRT, sex, age of diagnosis (p ≠ s Long Rank), were not predictors factors of OS in our retrospective study.

Conclusions: Complete resections, Temozolamide associated with 3DCRT, ECOG 0, younger patients significantly improve survival.

SYNERGISTIC ANTITUMOR EFFECTS OF MELATONIN PLUS IRRADIATION IN HEAD AND NECK CANCER CELLS

Guerra-Librero, A.; Fernández-Gil, B.I.; García-López, S.; Shen, Y.Q.; López, L.C.; Acuña-Castroviejo, D.; Escames, G.

Aims: We reported the first effective treatment for the prevention and healing of oral mucositis consisting in a melatonin's gel. With this therapy, which avoids the mucositis development, the life quality of cancer patients would improve significantly, and the radio- and/or chemotherapy could carry on without discontinuation. The objective of this proposal was to evaluate the existence of any synergism between melatonin with and radio- plus chemotherapy (rapamycin and cisplatin), to enhance the cytotoxic effects of the treatment in cancer cells. The dose-dependent effects of melatonin was analyzed in head and neck cancer human cells (HNSCC) CAL-27 in culture, treated with irradiation and/or rapamycin or cisplatin and we evaluated clonogenicity capacity of the cells, proliferation and apoptosis.

Materials and methods: The effects of melatonin were analyzed in cell CAL-27 treated with irradiation (8 Gy), rapamycin (20 nm) or cisplatin (20 μM). Cells were maintained in DMEN medium, supplemented with 10% fetal bovine serum at 37° C in a humidified atmosphere of 5% CO_2 and 95% air. Cells were treated

with melatonin (100, 500, 1000, 1500 and 2000 µM) alone or in combination with irradiation (8 Gy) or the chemiostatic agents. To analyze the treatment effect, we performed clonogenic assays, flow citometry and proliferation assay by MTT method. The results were analyzed with GraphPad Prism 6 software.

Results: The results show a significant decrease of the size and number of colonies, a decrease in the proliferation and an increase in apoptosis in the cells treated with melatonin alone or in combination with irradiation, rapamycin and cisplatinin a dose dependent manner.

Conclusion: High melatonin concentrations potentiate the citotoxicity effects of radio and/or chemotherapy in cancer cells.

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TEMOZOLAMIDE AND BEVACIZUMAB IN RECURRENT/ PROGRESSIVE GLIOMA

Cabrera, R.; Carmona, R.; Clavo, B.; Lloret, M.; San Miguel, I.; Morera, J.; Sosa, C.; Vicente, E.; Pons, D.; Lara, P.C.

Introduction: Recurrent glioma has a progression free survival (PFS) of 9 to 11 weeks in the absence of standardized treatment. Higher survival figures are described in patients diagnosed at earlier age, better performance status and metilated MGMT.

Aim: To assess the role of adding Bevacizumab to Temozolamide (TMZ) in recurrent/progressive glioma.

Materials and methods: Between 2007 and 2014 we have included in this study 25 recurrent/progressive after curative treatment, glioma patients (low grade gliomas in second recurrence and high grade gliomas on first recurrence). At diagnosis 5 cases were low and 19 high grade gliomas. One patient had no confirmed histology. Local treatment at recurrence/progression was surgery in five cases and combined surgery and radiotherapy in 3 cases. Systemic treatment included TMZ either standard (75 mg/m^2 every 28 days) or metronomic (40-60 mg/day) and Bevacizumab. (5-10 mg/kg every 15 days in the first 6 months, and 15 mg/kg every 21 days later on). Treatment was maintained until confirmed clinical or radiological progression.

Results: To date 6 out of 25 patients (25%) remain alive (2 patients have stable disease, 2 complete response and 2 more are in progression). Median PFS and overall survival were 12 and 24 weeks respectively. Actuarial overall survival was 14% at 2 years. The main side effects were grade II proteinuria (4%) and grade III hypertension (24%). One patient presented a bleeding episode leading to death.

Conclusion: We present a treatment schedule that achieves reasonable survival figures and better compliancy than other chemotherapy combination regimens.

THE ROLE OF RADIOSURGERY IN MELANOMA BRAIN METASTASES

Tovar, I.; Vargas, P.; Zurita, M.; Del Moral, R.; Guerrero, R.; Osorio, J.L.; Linares, I.; Prieto, C.; Rodríguez, S.; Expósito, J.

Objective and purpose: To analyze the results of our patients treated with radiosurgery (RS) for melanoma brain metastases.

Material and methods: 16 patients (27 metastases) treated with RS for melanoma brain metastases, between 2000 and 2012, were retrospectively reviewed. We evaluated the radiological control after RS treatment.

Results: The median age was 60 years old, 56% women and 44% men. The 69% of patients were classified as recursive partitioning analysis (RPA) class 2 and 31% as class 1. The median of received dose was 20 Gy (range 18-20 Gy). The median of tumoral volume was 0.98 (range 0.37-5.99). The local control was 74.1%. Regarding toxicity, there were 1 asymptomatic radiation-necrosis, 1 haematoma without clinical repercusión and 1 patients suffered epileptic seizure after RS. At the end of the follow-up all patients were died, except one patient who was alive with disease. The mean of survival from RS was 10 months (range 2-30 months), from the diagnosis of brain metastases was 11 months (range 2-32 months) and from the primary diagnosis was 67.33 months (range 25-195 months).

Conclusions: The RS treatment is safe and achieves a good local control in this kind of tumour that is considered radio-resistant.

THE ROLE OF RADIOSURGERY IN THE MANAGEMENT OF GLOMUS TUMOURS

Tovar, I.; Del Moral, R.; Zurita, M.; Arregui, G.; Saura, E.; Arrebola, J.P.; Pastor, J.; Expósito, J.; López, E.

Objective and purpose: Glomus tumours are benign slow-growing hypervascular neoplasm. The role of radiosurgery as primary treatment modality has increased. Treatment options include period of observation, surgical resection, embolization, radiotherapy or combination of them. Typically, radiotherapy treatment has been used for unresectable, partially resected and recurrent tumours. However, the number of reports on the use of SRS as primary treatment modality has increased. The objective of this study is to show our experience and to analyse different prognosis factors.

Material and methods: Data from 40 consecutive adult patients, who were treated between December of 1997 and December of 2012, were retrospectively analysed. All of them underwent head frame stereotactic radiosurgery (SRS) with LINAC as primary, adjuvant or salvage treatment for glomus tumours. Tumour and clinical control was calculated using the Kaplan-Meier method. Bivariate statistical analyses were performed to examine different prognosis factor, using logistic regression analyses.

Results: The median follow-up was 71 months. The radiological local and symptomatic control was achieved in 37 (92.5%) and 29 (72.5%) patients respectively. Toxicity was detected in 4 patients (10%) with newsymptoms related to impairment of V, VIII and X cranial par. In the bivariate analysis, dose coverage and maximum dose were associated with tumor control with an OR of 5.29 (p=0.041) and 2.67 (p=0.056) respectively.

Conclusion: SRS is a safe and efficacious treatment for glomus tumours that is associated with high probability of radiological and symptomatic control and low incidence of morbidity.

TREATMENT RADIOTHERAPY FOR MENINGIOMA. EXPERIENCE IN OUR CENTER

Almendros Blanco, P.; Hernandez Machancoses, A.; Verdu Lopez, F.; Granero Cabañero, D.; Pastor Peidro, J.; Garcia Miragall, E.; Vicedo Gonzalez, A.; Lopez Torrecilla, J.

Introduction and objective: To present our experience and an analysis of patients(p) diagnosed with meningioma treated with external radiotherapy, three-dimensional conformal(3DRT) or fractionated stereotactic(RTEF), and to evaluate clinical and radiological results. All cases were treated in a multidisciplinary standpoint in our Neurooncology-Committee.

Material and methods: From 01/2003 to 12/2014 32 lesions/30 patients were treated with histological or radiological diagnosis of meningioma. Of these, 17 p (56.7%) women/13 p (43.3%) males, mean age 57 years (19-81). Location injury: convexity 12 (37.5%)/ cavernous sinus 7 (21%.)/petroclival 5 (15.6%)/parafalx5 (15.6%)/ esphenoidal bone 2 (6.2%)/occipital bone1 (3.1%). Pathology: meningioma GI 7 (21.8%) cases/G-II 10 (31.2%)/G-III 3 (6.2%)/not bi-

opsy 13 (40.6%). The treatment was exclusive 20 (62.5%) lesions/adyuvant 12 (37.5%). An esterotaxic immobilization system was used. Irradiation was done in a linear accelerator using energy of 6 MV and a multileaf collimator. An on-line IGRT correction was done for all the patients using Exactrac or a CBCT system. Different treatment schemas were used: 180 cGy range-400 cGy/fx/5Fx (mode 180 cGy/fx) and mean BED of 50.6 Gy (24-60). RTEF was administered in 19 cases (59.4%) and 3DRT in 11 (40.6%), the chosen mode depended on size, location and histology of meningioma. Average following was 46 months (141-2). Follow-up was clinical and radiological.

Results: Acute toxicity to treatment(RTOG): G0/16 (50%); GI/15 (46.8%); GII/1 (3.1%) case. We found no significant chronic toxicity. In following: 2 exitus (1p/progression G -III and 1 p/pancreatitis) and 1 p lost; 2 p (6.7%) were reoperated due to appearance of new lesions and 28 lesions (87.5%) showed no recurrence/growth.

Conclusions: Results show that radiotherapy is an appropriate treatment in patients with meningioma, with good clinical/radiological results and acceptable toxicity. We recommend using 3RTD/RTEF depending on the size/location/histology of meningioma.

TREATMENT WITH GLIADEL® OF HIGH GRADE GLIOMAS

Villanueva Alvarez, A.; Perez Gomez, R.; Fortes de la Torre, I.; Galvan Banqueri, P.; Delgado Rico, R.; Herruzo Cabrera, I.

Patients and methods: We analyzed the treatment of 51 patients with Gliadel treated from 2003 to 2011. Mean age 53.6 years, 33 men and 18 women. Surgery: complete resection 86.3%, 13.7% partial. Glioblastoma multiforme 92.2%, 2% anaplastic oligodendroglioma and anaplastic astrocytoma 5.8%. Implant did to 5 to 8 tablets. Treatment: Temodal concomitant-adjuvant + gliadel in 51.2% and adjuvant Temodal + gliadel in 48.8%. RT 3D were administated in 92.2% and 7.8% RT 2D. 82% relapsed and 18% not. At the end of follow up 86% died and 14% were alive.

Results: The maximum response obtained after the treatment was 70% complete response, partial response 14%, and progression in 16%. Overall survival rate of 66.5%, 22%, 15.5%, 12.9%, 12.9% at 1, 2, 3, 4 and 5 years, respectively, and 9.7% at 10 years. The median survival are 16 (IC 1,2; 15.3-18.4 months). Rate of free recidive survival of 30%, 25% and 0% at 1, 2, 3 years respectively, with a median survival of 8 (CI 1.2; 5.5-10,4 months). Univariate analysis for overall survival was significant age (<60), KS 100 and QT type and no significant gender, type surgery, pathology, and treatment response.

Conclusion: Gliadel temozolomide alone or associated with concomitant/adjuvant regimen is a tolerable treatment. Overall survival was 66.5% and 12.9% at 1 and 5 years, statistically significant increase in young patients, receiving Gliadel + Temodal and associated with good KS. The free recurrence survival was 30% and 25% at 1 and y 2 years.

TREATMENT WITH RADIOSURGERY IN SINGLE SESSION IN BRAIN METASTASES

Vargas Arrabal, M.P.; Tovar Martín, M.I.; Expósito Hernández, J.; Zurita Herrera, M.; Del Moral Ávila, R.; Guerrero Tejada, R.; Linares Galiana, I.; Prieto Prieto, C.; Gentil Jiménez, M.A.; Rodríguez Pavón, S.

Purpose: Until the advent of radiosurgery, the main treatment option consisted of cranial radiation for palliation. With a more radical intent, and only in selected patients, surgical resection and adjuvant radiotherapy was indicated later.The purpose of this study is to evaluate the results obtained after treatment with single-session radiosurgery.

Materials: Between 2002 and 2014, has collected a representative sample of 592 patients with histological diagnosis of brain metastases, of which 340 were men and 252 women. The average age in this group was 55.67 years (14-82 years) and with a KPS of 90 in 58.3% of patients. The most common location of these was lung 51%, followed by breast 17.1%. The most frequent pathological study adenocarcinoma was 23.5%, followed by squamous 10.6%. In most 63.2% no surgery was performed. The most common site was the frontal 24.4%. All patients were treated with radiosurgery single session with a median dose of treatment 18 Gy.

Results: With a median follow-up of 7 months, median survival was 14.23 months in a range of 0-117 months. In terms of toxicity, only 3.5% of the presented radiation necrosis (21 patients), while the cerebral edema was reported in 10.8% (64 patients).

Conclusion: The single session radiosurgery is a conservative but with a radical purpose, offering technical and few side effects is very convenient for the patient.

TUMOR PROGRESSION-VS-NECROSIS IN RESECTED BM TREATED WITH RADIOSURGERY-OR-HYPOFRACTIONATED RADIATION THERAPY

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Introduction: 8-14% of patients with brain metastases (BM) treated with stereotactic radiosurgery (SRS) or hypofractionated radiation therapy (HRT) underwent surgery due to neurological deterioration or local recurrence/necrosis. The pathological studies show 4-26% of necrosis. We analyze our intitutional experience in this group of patients and the relationship between clinical and tumor characteristics that predict tumor progression/necrosis.

Material and methods: We have retrospectively reviewed patients with BM that underwent surgical resection after SRS or HRT. Brain MRI an/or PET-FDG/MET were the images techniques used in the FU. BM volume, EQD2, primary tumor and MRI appearance of the lesion (homogeneous or focal BM growth) were the variables analyzed.

Results: From May-00 to June-14, 445 patients BM were treated with SRS/HRT and 22(5%) patients were operated with a median time interval of 15.6 months. Primary tumors were NSCLS (15), melanoma (2) and other histology (5). The median SRS and HRT prescription doses were 16 Gy and 45.5 Gy, respectively and the median EQD2 was 34.7 Gy and 52.8 Gy for a/b=10, respectively. Pathological analyses described necrosis, necrosis+tumor or tumor in 8 patients (36.4%), 2(9%) and 12 (54.5%) respectively. PET-FDG/MET performed before surgery shows tumor progression in all patients. On the univariate analysis, none of the variables considered were predictors of necrosis or tumor recurrence.

Conclusions: In our series, 5% of patients treated with SRS/HRT required surgery and 36.4% of them presented pathologically confirmed necrosis. The PET-FDG/MET is not able to differentiate tumor from necrosis. BM volume and EQD2 were not associate with radiation necrosis.

WBRT WITH SIB IN CEREBRAL METASTASES WITH FRAME-LESS

Rivero Silva, M.; Montero Perea, E.; Velázquez Miranda, S.; Rubio Jiménez, M.; Ortiz Gordillo, M.J.

Objectives: Whole brain radiation therapy (WBRT) combined with a boost over cerebral metastases has shown benefit in sur-

vival versus WBRT alone in the RTOG 9508 trial. Our aim was to evaluate our institute experience in the treatment of cerebral metastases with WBRT with simultaneous integrated boost (SIB) with VMAT.

Material and methods: We selected patients treated between 2011 and 2014 with ECOG≥1, brain limited disease, and ≤4 metastases with less than 20 cc of volume. The immobilization was done with a Frame-less device patented by our institution which consists in a thermoplastic mask reinforced with a high precision silicon sub-mask. We obtained CT an MRI axial 2 mm thickness images and fused it with excellent quality for planification. The positioning was done with diary IGRT and the treatment was imparted by VMAT. In all cases the maximum tolerable dose for hippocampus was 10 Gy. In prophylaxis encephalic arcs we prescribed 20 Gy, and 20 Gy more for metastasis. The total time employed in the treatment design was about 7 hours.

Results: 11 patients with 14 metastases were treated with WBRT with SIB. All patients showed extracerebral disease controlled. The average CTV volume was 5.5 cc. Any patients suffered grade IV toxicity. The median surveillance was 7 months. The median survival was 9 months.

Conclusions: WBRT with SIB over cerebral metastases performed with VMAT and IGRT could be comparable to a stereotactic treatment under a theoretical evaluation of toxicity and physics doses administered.

COMBINED TREATMENTS

A CASE REPORT OF FATAL CETUXIMAB-ASSOCIATED PULMONARY TOXICITY

Glaría Enríquez, L.A.; Ramos, G.; Romero, A.L.; Reyes, J.A.; Castaño, A.; Colmenar, A.; Escribano, A.; Huerga, C.; Mañas Rueda, A.

It's common to use epidermal growth factor receptor (EGFR) inhibitors in head and neck cancer patients. We report a case of a 73-year-old woman with a early recidive of head and neck cancer of mandible after resection. The patient was treated with radical radiotherapy and cetuximab. At 60 Gy dose the patient was hospitalized by clinic deterioration associated to severe mucositis and dermatitis (grade III/IV, acneiform rash). The radiotherapy/biotherapy combined treatment was maintained. The patient suffered a progressive respiratory distress without clinical, microbiological or antigenemia infection findings. The cetuximab treatment was interrupted. CT image found a interstitial pneumonitis/bronchiolitis obliterans organized pneumonia. A retrospective review of cone-beam CT (CBCT) image shown a marginal image of progressive bilateral lung infiltrates. Despite the lack of infectious data the patient received widespread antibiotic treatment plus respiratory support and corticoids. At the end of the process the infectious data remained negative with the exception of antigenemic to citomegalovirus. The patient died. The dosimetric and isodosic review showed low and marginal dose to a very limited lung volume. Report of cetuximab-associated pulmonary toxicity are rare, although there have been extensive reports of interstitial fibrosis with the use of other EGFR inhibitors such as erlotinib and gefitinib. There are many causes of pulmonary infiltrates. This report highlights the importance of considering drug toxicity in patient with cetuximab treatment and clinical pneumonia without microbiological findings. The CBCT performed during radiotherapy treatment can show early pulmonary change that can be useful as alert sign of potencial severe lung complications.

DYSPHAGIA RELIEF WITH TAPENTALOL IN ESOPHAGEAL AND LUNG CANCERS

Mena, A.M.; Jimenez-Jimenez, E.; Pardo, J.; Montemuiño, S.; Aymar, N.; Ortiz, I.; Vidal, M.

Purpose: Esophagitis and dysphagia is a common side effect in the treatment of lung and esophageal tumors. Our aim was to assess the control of dysphagia with Tapentalol in patients in treatment with radiotherapy and impact on quality of life.

Material and methods: Twenty-two patients were analyzed prospectively. 10 patients (45%) received concomitant radiochemotherapy (RCT) for esophageal cancer and 12 (55%) received concomitant or sequential CRT for lung cancer. Three consecutive visits were conducted: the first baseline to evaluate the patient, the second visit when the patient had symptoms and third visit to reassess. On the second visit Tapentalol was prescribed. Quality of life was assessed by the EQ-5D questionnaire at each visit, assessing mobility, personal care, daily activities, pain and anxiety.

Results: The degree of dysphagia showed increase between baseline and the next visit ($p<0.0001$) related to treatment. However, dysphagia significantly improved when Tapentalol was prescribed ($p=0.0126$). By subgroups, patients with lung Cancer and patients with concomitant CRT had higher dysphagia after baseline, and improved more with Tapentalol. The mean dose of dysphagia-G2 was 40 Gy in Lung Cancer and 17 Gy in esophageal cancer.Quality of life had a decrease between baseline and the first visit ($p=0.0001$) related to the treatment but significantly improved after taking Tapentalol ($p=0.0017$).

Conclusions: Dysphagia caused by radiotherapy in patients with esophageal or lung cancer can be controlled with Tapentalol. Control of pain and dysphagia improves the quality of life of patients. This may prevent treatment interruptions.

FEASIBLITY STUDY QUASI-EXPERIMENTAL DEEP HYPERTERMIA: LOCAL A STANDARD TREATMENT CANCER

Herruzo Cabrera, I.; Contreras Martinez, J.; Bayo Lozano, E.; Delgado Gil, M.; Perez Gómez, R.; Fortes La Torre, I.

Introduction: This is the very first study of hyperthermia treatment associated with standard cancer treatment, carried out in Andalusia (Spain).

Material and method: Prospective analyse of treatment with hyperthermia (6-10 sessions/2-3 per week) associated with standard treatment of RT, QT or combination in patients with primary tumor and metastatic tumors with a expected survival at 6 months.

Results: 63 patients we have treated (31 of H Juan Ramón Jiménez and 32 of Carlos Haya H). 38 men and 22 women. Mean age 59.4 years (34-80 a). ECOG 0 (76.3%), 1 (22%) and 2 (1.7%). Treatment technique: 10 sessions of hyperthermia, 2-3 per week, 1 hour with a power between 150 and 400 w according to the location associated with standard cancer treatment. Large blades (64%) or small (35.6%) at different locations were used. Toxicity: Acute mild in 56.9% of cases and absent in 43.1%. Cutaneous pain level I (12.1%), burning sensation I (41.4%) and II (12.1%), feeling of pressure I (3.4%) grade, grade I burn (5.2 degree %). 83% of patients completed the planned scheme and 17% was suspended for various reasons. Tolerance has been satisfied or very satisfied in over 80% of patients.

Conclusions: The treatment is feasible with a high degree of satisfaction of 80.8% (very satisfied or satisfied) and comfortable or very comfortable in 78.9% of patients in the public health environment. No toxicity in 44% and mild in 56. It is essential to do a selection of the patient.

HAEMOPHAGOCYTIC SYNDROME AS A COMPLICATION OF COMBINED CHEMO-RADIOTHERAPY TREATMENTS

Pérez Montero, H.; Gascón Costoso, N.; Gil Haro, B.; Pedraza Fernández, S.; Moreno Hurtado, A.; Cabezas Mendoza, A.M.; Rodríguez González, V.; Campos Bonel, A.; Nenclares Peña, P.; Pérez-Regadera Gómez, J.F.

Aims and purposes: Combined chemoradiotherapy treatments involve complications for oncologic patients. We report two cases of Cervical Carcinoma that occurred in the Radiation Oncology hospitalization ward, both complicated with the rare entity of haemophagocytic syndrome (HS), which can be fatal if early treatment is not initiated.

Material and methods: The first case is a female patient aged 73, treated for cervical carcinoma with radiotherapy and Cisplatin. After the fifth cycle of chemotherapy she begins with severe constitutional symptoms followed by disproportionate pancytopenia and fever. The diagnostic procedure ended with the result of HS. The second case is a female patient aged 63 with similar diagnosis and cancer treatment, which after administration of the third cycle begins with a resemblance of the previous case, also fulfilling criteria for HS but she was diagnosed earlier and started treatment immediately.

Results: Both patients received treatment directed at this syndrome with mixed results. In the first case, although the correct treatment was dispensed, the patient had a progressive general worsening and she complicated until decease. The second case, after the introduction of high-dose corticosteroid treatment, presented immediate improvement in analytical and clinical parameters, so the patient could continue with her oncologic management after this complication.

Conclusions: HS is an entity that radiation oncologists should suspect and know when we establish certain treatments to our patients because it is a very aggressive disease that must be treated as early as possible, with significant improvement in many cases but also with fatal consequences if appropriate management is not applied.

RADIOTHERAPY IN EARLY STAGE OF CELL LYMPHOMA DIFFUSE B

Villamil, S.; Fuentes, C.; García, M.E.; Salinas, A.; Martin, J.J.; Martínez, J.C.; Armijo, A.; Hernández, R.; Borque, C.; Espiñeira, M.

Introduction: The standard treatment of non-Hodgkin lymphoma diffuse cels B Stage I-II has been CHOP chemotherapy and Radiotherapy 3-4 cycles of affection field. Since the introduction of rituximab (R-CHOP) There is some controversy over whether this pattern is still valid, no comparative studies on the subject (Rituximab plus chemotherapy/radiotherapy vs rituximab plus chemotherapy. The aim of our study is to analyze the overall survival of patients treated in our hospital.

Material and methods: Between January 2005-May 2014, were identified 67 patients with non-Hodgkin lymphoma diffuse large B cell with localized stages. 33 (49%) women, 34 (51%) males. The average age was 69 years (24-93 years). All patients received R-CHOP chemotherapy, except 2 (MACOB and CVP). The mean follow-up was 51 months (4-100 months).

Results: 79% of patients received radiotherapy (53 patients), Overall survival was 80% at 3 years. There were no significant differences between patients who received radiotherapy and non p=0.63 (81% with radiotherapy vs 76%). All patients received 4 cycles or less of R-CHOP received radiotherapy, however those who received more than 4 cycles (median 6 cycles) 63% (22 patients) received radiotherapy p=0.007. The survival at three years for patients treated with 4 cycles of R-CHOP and radiotherapy was 90% vs 78% for those who received more than 4 cycles, p=0.27.

Conclusions: Following the introduction of Rituximab with 4 cycles R-CHOP radiotherapy, in our study, is at least as effective as longer chemotherapy treatments. Pending randomized trials cycles of R-CHOP plus radiotherapy continues to be an alternative choice.

RESCUE FOR HGG: FSRT + BEVACIZUMAB AFTER RESPONSE TO BEVACIZUMAB+CPT-11

Conde-Moreno, A.J.; García-Gómez, R.; Albert-Antequera, M.; Almendros-Blanco, P.; De las Peñas-Bataller, R.; López-Torrecilla, J.; Ferrer-Albiach, C.

Aim: To evaluate the possibility of implementing a new scheme of rescue treatment after relapse or progression of high-grade glioma (HGG) treated at the first-line with bevacizumab and irinotecan (BVZ+CPT11), evaluating the response and toxicity of associating BVZ and fractionated stereotactic radiotherapy (BVZ+FSRT).

Background: The treatment choices for relapse patients with high-grade glioma include surgical resection and systemic treatment with chemotherapy drugs or new molecular therapy agents until the administration of a second brain irradiation dose.

Materials and methods: We retrospectively analysed data from 59 patients wit relapse of HGG. Nine patients with HGG relapse after treatment using the Stupp protocol that were treated with BVZ+CPT11 for progression between July 2007 and August 2012, after which the response was assessed according to the revised assessment in neuro-oncology (RANO) criteria. BVZ was administered at a dose of 10 mg/kg and FSRT up to a prescribed dose of 30 Gy, 500 cGy per fraction, three days a week. The median follow-up was 38 months.

Results: The treatment was well-tolerated by all patients. The response after nuclear magnetic resonance imaging (MRI) at 3-6 months was progression in two patients, stable disease in four, and three patients had a partial response. The median overall survival (OS) from diagnosis until death or the last control was 36,8months.The median progression-free survival (PFS) was 10.8 months. The OS was statistically significant, and was higher in grade-III gliomas.

Conclusion: The combination of BVZ+FSRT as a second-line HGG relapse rescue treatment is well-tolerated and seems to offer promising results.

VERSATIS® AND FOCAL NEUROPATHIC PAIN IN CANCER PATIENTS (SCREENING TOOL)

Prieto Prieto, C.; López Ramirez, E.; Tovar Martín, I.; Del Moral Ávila, R.; Zurita Herrera, M.; Linares Galiana, I.

Objectives and purpose: Lidocaine 5% patch (L5%P)=(Versatis®) represents a novel therapeutic approach to neuropathic pain in cancer patients. The objective of this study is to evaluate its role in treating acute or chronic focal neuropathic pain (FNP) in cancer patients, regardless of its causal relationship with the tumour.

Methods: We collected information from 33 cancer patients with focal neuropathic pain (FNP) treated with L5%P. Some interesting data related to L5%P use were analyzed: NP nature, body areas affected, previous and concomitant analgesic treatment, time from patch application to analgesic effect, duration of therapy with L5%P, analgesic efficacy and adverse reactions. Therapeutic indication with L5%P was established in all patients

using a validated FNP screening tool (ST) consisting in 4 simple questions.

Results: All patients underwent radiotherapy in our Departments. 66.7% of them (n=22) suffered from FNP related with cancer and its therapies. In the other 33.3% of cases (n=11), FNP was not considered related. Potent analgesic effect of L5%P was observed in 23 cases (69.7%), and partial effect in 5 cases (15.2%). It represents an 84.9% of efficacy in our sample. 81.3% of patients did not report adverse reactions at all. 45.5% of patients achieved pain control within one week after starting L5%P treatment. 39.4% of patients did not need concomitant analgesic treatment.

Conclusion: Our data support that L5%P (alone or in association with other drugs) may be an effective and safe approach for FNP in cancer patients.

SKIN TUMORS

ADJUVANT HIPOFRACTIONATED RADIOTHERAPY IN AXILLARY MELANOMA: A CASE REPORT

Garcia Cañibano, T.; De Torres, M.V.; Ludeña, B.; Rodríguez, C.

Introduction: 20% of patients with melanoma will develop lymph node metastases. Lymphadenectomy is the primary treatment, but recurrence rate is 50% when extra capsular extension (ECE) is present. We report a clinical case and make a review of the benefit of adjuvant radiation therapy.

Case: A 63 year-old woman, with a previous history of multiple myeloma (MM), treated with TASPE and several lines of chemotherapy, was diagnosed of acral melanoma pT3pN1 mic(sn)M0, treated with excision and lymphadenectomy in 2008. Axillary relapse in 2012, treated with resection of two lymph nodes, one of them with ECE. She received adjuvant radiotherapy on the axillary surgical bed to a total dose of 48 Gy (5×2.4 Gy). No adjuvant interferon (IFN) was administrated because her MM precedent. 30 months after the radiotherapy, she is recurrence free and doesn´t have lymph edema neither skin toxicity.

Discussion: Historically melanoma has been considered a radio resistant tumor. Retrospectives studies had showed that adjuvant radiation therapy could decrease regional-nodes relapses. In 2012, a multi institutional phase III trial published confirmed that adjuvant radiotherapy reduced lymph-node relapse significantly compared with the observation group. This improve is better in patients with adverse factors (multiple positive nodes, ECE, regional recurrent disease), The scheme used was 48 Gy (5×2.4 Gy).

Conclusion: Adjuvant radiotherapy decreases regional nodes relapses in high risk patients, with an acceptable treatment-related morbidity.

EFFICACY AND SAFETY OF ELECTRONIC BRACHYTHERAPY FOR BASAL CELL CARCINOMA

Celada Álvarez, F.J.; Ballester, R.; Pons, O.; Candela-Juan, C.; de Unamuno, B.; Chicas Sett, R.; Gimeno, J.; Botella, R.; Tormo, A.; Pérez Calatayud, J.

Objectives: Electronic brachytherapy (EBT) is a new modality for skin brachytherapy. A prospective single-center and non-randomized pilot study has been performed to assess the efficacy and safety of EBT basal cell carcinoma (BCC) using Esteya®.

Material and methods: Esteya, a new EBT system, is a HDR X-ray source positioned directly into skin applicators, combining the benefits of brachytherapy with reduced shielding requirements. From June´14 to February´15 23 lesions in 20 patients have been treated and followed-up. The gross tumor volume was dermoscopically assessed, and the tumor depth was evaluated using high-frequency ultrasound imaging and histopathology. All lesions for the selected cases were limited to 4 mm depth. A specific applicator template was used in order to delineate on the skin an external mark to fit the selected applicator and facilitate the set-up. The prescription dose was 42 Gy in 6 fractions (biologically effective dose ≈70 Gy), delivered twice a week.

Results: The most common location was head and neck (70%). The maximum diameter of lesions ranges from 8 to 20 mm (average 11.9 mm). Mean tumor thickness was 1.57 mm (0.25-2.9) measured by histopathology and 1.90 (0.5-3.7) measured by ultrasonography. With at least 6 months follow-up all lesions (100%) were solved with a complete response. Maximum acute toxicity was Grade 2 (CTC v2.0 scale) and in any case was solved at months. Regarding long-term toxicity, 61% of the lesions showed no skin alteration. The rest of the lesions showed only very slight alterations (G1-RTOG-EORTC scale).

Conclusions: Initial outcomes treating with EBT are encouraging, with superb control rates and cosmetic results.

GLOBAL GOOD RESPONSE FOR A LOCAL RADIOTHERAPY TREATMENT IN KAPOSI'S SARCOMA

Najjari, D.; Lucas, A.; Galdeano, M.; Piñeiro, R.; Bavestrello, P.; Rojas, F.I.; Guedea, F.

Background: We report a case of Kaposi's sarcoma treated locally with radiotherapy that presented in the following controls a globally good response of all lesions, suggesting Abscopal effect.

Case description: We report an 96-year-old woman visited our clinic with a 13-years history of skin lesions on both legs diagnosed as Kaposi's sarcoma VHS8+ and HIV-. On physical examination, he had multiple, discrete violaceous to brownish patches on both distal legs and extensive indurated, hyperkeratotic plaques and nodules withs signes of co-infection. No other similar skin lesions were noted anywhere else on his body. For 2 years ago the lesions increased and we decided to treat the symptomatic lesions in the right leg and she received local radiation therapy at 3.0 Gy per fraction, every week for 10 weeks (total dose, 30 Gy). At 3 months of follow-up, we it showed considerable and partial regression of the skin lesions and symptoms occurred in both legs perhaps we treated a local región in the right leg, suggesting an abscopal effect in our case.

MANAGEMENT OF MICROCYSTIC ADNEXAL CARCINOMA: A PROPOS OF A CASE

Sánchez Belda, M.; Alonso Martínez, P.; Sanmamed Salgado, N.; Rubí Olea, L.; Rodríguez Minguez, L.; Diezhandino García, P.; Herrera Román, M.; Garavís Vicente, M.I.; del Valle Rivero, M.L.; López-Lara Martín, F.

Introduction: Microcystic adnexal carcinoma (MAC) is infrequent, slow growing, invasive neoplasia with predilection for head and neck. It rarely metastasizes but it is locally aggressive and commonly demonstrates perineural invasion. MAC occurs most often in older adults and women. Minimal data are available regarding the role of radiotherapy.

Material and methods: 75 year old patient male with basal cell carcinoma surgery in right forearm in 2003. New tumor in right elbow and hypoesthesia appears in 2013. Positive biopsy is performed to basal cell carcinoma and subsequently removed with result of infiltration by microcystic adnexal carcinoma poorly differentiated with margin <1 mm in the deep end and perineural infiltration. On physical examination there were clin-

ically positive axillary lymphadenopathy performed with results for microcystic adnexal carcinoma.

Results: Due to the high risk of local relapse being a recurrence with next margin and positive lymph nodes, was decided to manage postoperative radiotherapy on armpit and elbow injury bed. 66 Gy in both locations were planned but finally the elbow treatment was suspended at 62 Gy for radiodermitis II and onset of lymphedema.

Conclusions: Microcystic adnexal carcinoma is an uncommon, locally aggressive cutaneous neoplasm with a slow-growing, asymptomatic lesion, frequently misdiagnosed due to its histologic appearance on superficial biopsy specimens. Symptoms are pain, anesthesia and paresthesia due to perineural infiltration. Surgery is the primary treatment modality. Radiotherapy postoperatory may improve local control and its use should be considered in patients with high-risk features for local recurrence. Both of them offer excellent locoregional control with acceptable toxicity.

MERCKEL CELLS CARCINOMA IN EYELID, AN UNUSUAL LOCATION

Sanmamed Salgado, N.; Rubí Olea, L.; Herrera Román, M.; Alonso Martínez, P.; Sánchez Belda, M.; Diezhandino García, P.; Del Valle Rivero, M.L.; Garavís Vicente, M.I.; López-Lara Martín, F.

Objective: Assessment of radiation therapy in the Merkel cells carcinoma in eyelid.

Material and methods: 72-year-old woman without interested precedents, who after presenting exophytic injury in the upper eyelid of right eye is diagnosed of Merkel cells carcinoma. There was realized complete resection of the injury and extension study that confirms the absence of distance disease. She was sent to our service to asses adjuvant treatment. She received treatment with external radiotherapy through an anteroposterior field, with 12 MeV electrons and bolus of 0,9 cm. Treatment volume was comprising right eyelid getting 46 Gy (50 Gy programmed), with a standard fractionation.

Results: The patient presented grade II dermatitis in upper and lower eyelid, continuously tearing and previous pole conjunctivitis with positive culture for S. Aureus and Serratia. She needed treatment suspension two days before completing the dose prescribed. After 5 years of follow-up, the patient is disease-free.

Conclusions: The incidence of Merkel cells carcinoma in eyelid is 10%. It is a highly aggressive tumor that produces local recurrence in 25% of the cases and lymph node involvement in 30%. The dissemination is usually produced in the first two years after the diagnosis. The treatment of choice is surgery. Adjuvant radiation get improvement in local control. The treatment can be raised either with external radiation therapy and brachytherapy.

RADIOTHERAPY AS FIRST CHOICE IN ADVANCE NMSC?: 6 YEARS EXPERIENCE

Arregui López, E.; Mendoza Chaparro, C.; Romero Aguilera, G.; Morera López, R.

Purpose and objective: The incidence of non-melanoma skin cancer (NMSC) is increasing due to sun exposure and elderly population. The objective of this study is to evaluate the effectiveness of radiotherapy in locally advanced cases of NMSC treated exclusively by this technique.

Material and methods: We performe a descriptive observational study of patients with locally advanced NMSC treated only with radiotherapy during the period 2006-13. Patients with SCC and BCC greater than 3 cm in diameter were included. The analyzed variables were age, geographical area, tumor location, histological type and size, type of RT used, treatment duration, toxicity and response.

Results: A total of 155 NMSC patients were treated and 74 were tumors larger than 3 cm. Of these, 15 patients had a diagnosis of CBC, the rest were SCC. The ages ranged from 68 to 103 years. The most common locations were the cheeks (24%) and temple (21.6%). The average size was 4,7 cm. The total dose was 36-78 Gy, average 51.8 Gy. The fractionation was highly variable between 1 and 35 doses, with an average of 16.5 sesions. Nineteen patients had grade 2 radiodermitis and 18 degree grade 3. Complete response was achieved in all cases, there was only one recurrence and 6 exitus, none related to skin cancer.

Conclusions: Tumors greater than 3 cm are more frequent in older patients, often in locations involving complex surgical reconstructions. In these cases, treatment with radiotherapy demonstrates a high response rate, good tolerance, good cosmesis and low number recurrences with hypofractionated schemes.

RADIOTHERAPY FOR LENTIGO MALIGNA. CASE REPORT

Feltes, N.; Caballero, S.; Colomer, M.; Solé, J.M.

Introduction: Lentigo maligna (LM) is a melanocytic lesion most commonly found on the face of elderly patients with chronically sun-damaged skin. Because 25% of malignant melanomas arise from lentigo maligna, early recognition and treatment are important.

Objectives: To describe our first experience in the treatment of a LM exclusive with external radiotherapy and review literature.

Methods and materials: A 73 year-old white man was referred for a 2.5×2 cm pigment lesion on his nose. The lesion had been growing over many years. A punch biopsy showed atypical melanocytes along the dermoepidermal junction, without evidence of invasion, consistent with LM. Radiotherapy was delivered to the lesion with 1.5 cm margins using 0.5 cm bolus and 6 MeV electrons. The total dose delivered was 45 Gy in once-daily (2.50 Gy fraction). The tolerance was excellent. At 8 weeks after completion of radiotherapy, the lesion had almost completely resolved. There was no evidence of recurrence at the last follow up visit (12 months after radiotherapy).

Conclusion: Management of LM is open to debate, with a notable lack of randomized trials and specific guidelines and protocols. The treatment of choice for lentigo maligna is surgery but sometimes not feasible because of potential aesthetic, comorbidity, or patient preference. Radiotherapy does appear to be a reasonable choice of treatment in patients who are not operative candidates.

TREATMENT OF NO-MELANOMA SKIN CANCER USING HIGH DENSITY BOLUS

Campos Triviño, B.M.; Quintana Angel, B.; Velazquez Miranda, S.; Guerrero, J.M.N.; Ortiz Gordillo, M.J.

Objective: Basal cell and squamous cell carcinomas constitute the largest group of cutaneous epithelial cancers. Surgery is the mainstay of treatment but RT is recommends to treat no-melanoma skin cancers when tumors margins are positive or nearest, for any NMSC that shows evidence of substantial perineural involvement and when is necessary nodal radiotherapy; primary RT is an effective treatment option for elderly patients or when surgical morbidity would be unacceptably high; RT will, in

certain circunstances, give the bbst cosmetic and/or functional results. Treatment with high-energy photons when using high density bolus (eXaSkin of Anatomical Geometry) getting so a more precise treatment and possible inclusion of nodal areas in the same treatment dose distribution.

Method: We treat 5 patients. In two patients the lesions were inoperable; the stadium was in all cT2cN0. The lesions was on the scalp in 3 patients, 2 patients on facial area and on pinna in a patient, Thermoplastic immobilization mask was used. The treatment consisted of RT 3D CT images performed with bolus high density (eXaSkin) placed over the lesion to be treated with photon dose of 70 Gy and in the two patients not operated CTV has added a lymph drainage levels with doses of 50 Gy.

Results: In the 2 non-operated patients with a complete response of both clinical and radiological lesion after the treatment and remained asymptomatic with track 7 and 11 months was obtained. Patients in the RT is indicated postoperatively are disease free after 6 months of stopping treatment.

TREATMENT RESULTS OF CUTANEOUS MYCOSIS FUNGOIDES (MF)

Gutiérrez, B.; Ballester, R.; Tuset, V.; Jovè, J.; Melero, A.; Pérez, G.; Luis, Y.; Luguera, E.; Villà, S.; Arellano, A.

Purpose: To review recent treatment results of the modified Stanford dual technique for Total Skin Electron-Beam Irradiation (TSEI) in Mycosis Fungoides.

Material and methods: Study includes data from 39 patients treated between 1996 and 2013, 25 male, 14 female (ratio 1.8:1). 100% white. Median age 56 (range 33-85). 14 presented with stage I, 15 stage II, 3 stage III, 7 stage IV. We performed daily "in vivo" dosimetry as quality control in all cases, as well as protection of the nails and corneas. TSEI dose was 30-36 Gy (2 Gy/2 days). 7.5-9 weeks of treatment. (12 Gy to a patient with a stage Ia). Boost was delivered to concealed areas in all cases: 30 Gy to perineum, 16 Gy to calvaria and 10 Gy to armpits. Energy of electrons was 6 MeVs at high dose rate.

Results: 6 patients achieved complete remission with NED, 17 complete remission with later relapse, 14 initial partial response and later disease progression, and 2 maintained partial response. Partial response of >90% was reached in most cases. 12 patients are alive with NED (9 male, 3 female, ratio 3:1; 4 stage I, 7 stage II and 1 stage IV who also received allogeneic HCT). 4 present stable disease. 16 died due to MF. 7 died due to other causes (80% free of disease).

Conclusions: TSEI is an effective treatment for MF in early stages. At the presentation, we will update new patients and new treatment modalities.

VMAT/IGRT IN PULMONARY MELANOMA METASTASES: A CASE REPORT

Cucarella Beltran, P.; Alonso Pantiga, R.; De la Rua Calderon, M.A.

Background: To asse a case of lung metastatic melanoma after high dose VMAT RT.

Material and methods: 40 years old female, with surgical treatment cutaneous melanoma of the back in 2003. Two years ago developed solitary lung metastase treated with left upper lobectomy, eight months ago presented 2 lung metastases with histological report of melanoma. Our multidisciplinary team decide to treat both with high dose VMAT radiotherapy. The patient was treated after 4DCT for respiratory motion control and daily imaged CBCT. The RT treatment was performed in 2 phases: Phase 1 with PTV2 irradiation (left hiliar lesion), total dose 22.5 Gy in 5 fractions daily and Phase 2 with PTV1 and PTV2 irradiation. PTV1 (left subpleural lesion) total dose 50 Gy in 5 fractions daily and PTV2 irradiation, total dose 37.5 Gy in 5 fractions.The patient was irradiated with VMAT system True Beam with 6 MV photon energy and FFF beams. At Phase 1 with a left lateral semiarc and at phase 2 with two on the robotic table Exactrac.

Results: PTV coverage was for PTV1 (50 Gy) D95%: 100%, and for PTV2 (60 Gy): 100%. VMAT achieved good sparing of the lung (V20<10%) and heart (V20: 0%). The recent evaluation by PET-FDG/TC shows a considerable reduction of lesions. Currently the patient has a good PS and a good pulmonary function.

Conclusions: Use of VMAT is a promising alternative treatment for pulmonary melanoma metastasis in patients non subsidiary to surgical treatment.

UROLOGY

[^{11}C]CHOLINE PET/CT IN THE BIOCHEMICAL RECIDIVE OF PROSTATE CANCER (PCA) AFTER RADIOTHERAPY

Glaría Enríquez, L.A.; Rodado, S.; Colmenar, A.; Coronado, M.; Castaño, A.; Escribano, A.; Mañas, A.

The increase of prostate-specific antigen (PSA) after external beam radiotherapy (EBRT) is the most sensitive tool for detecting prostate cancer (PCa) recurrence, although this measure cannot distinguish between local, regional, or distant recurrence[1]. In general, time to PSA relapse, PSA velocity and PSA doubling time are useful in patient assesment. The recidive of prostate cancer after prostatectomy or radiotherapy requiere image survey for metastasis identified. In the restaging of prostate cancer recurrence, choline PET/CT is a promising imaging modality for the detection of local regional and nodal recurrence with an impact on therapy management[2]. Due to its high accuracy in detecting and localizing recurrences when a biochemical failure occurs, [^{11}C]Choline PET/CT may play a role in the re-staging phase to distinguish patients with local versus distant relapse, thus influencing patient management (curative versus palliative therapy)[3,5]. We present the data of the 22 betwen 2010 to 2012 patients with biochemical recidive after radiotherapy treatment evalued through PET-CT choline. In the 63% (n=14) of this serie [^{11}C]Choline PET/CT can identified recidive. In the 18% (n=4) the recidive was identifies limited to the prostate (parcial or difuse). Other 18% has been limited extrapelvic nodal disease (n=4), one of these have also bone metastases. Other 2 patients shown bone metastases (for a total of 4 patients with bone metastases). The half (2 patients) with bone metastases in [^{11}C]Choline PET/CT shown metastases in (99m)Tc bone scintigraphy too. We register the total PSA and PSA doble time (PSA DT) previous to [11C]Choline PET/CT as soon as the inicial TNM state and Gleason score. Media of PSA-DT was 5, 28 months. Three [^{11}C]Choline PET/CT positive patients shown PSA-DT over 10 months. All positive [^{11}C]Choline PET/CT patients was some inicial high risk features. These data are very limited and was sufficient for an inferencial statistic analises. However we can suggest that [^{11}C]Choline PET/CT in biochemical recidive in patients with some inicial high risk factor can detect a focus of disease, local or distant. This metabolic detected recidive were limited in size and number (oligorecurrence/oligometastases). Our data are in the same direction of the published data of [^{11}C]Choline PET/CT as a high sensitivity and specificity techniques for the detection of locoregional and distant metastases in PCa patients with recurrence of disease[4]. Prior to radiation treatment of recurrent prostate cancer, choline PET/CT may prove useful for patient stratification by excluding distant disease which would require systemic therapy[4]. Limited

data are currently available on the role of [11C]Choline PET/CT in target volume selection and delineation. According to available literature, [11C]Choline PET/CT is not clinically recommendable to plan target volume both for primary prostate treatment and for local recurrence. Nevertheless, promising data suggested a potential role of [11C]Choline PET/CT as an image guide tool for the irradiation of prostate cancer relapse[5].

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11C-CHOLINE PET/CT GUIDED RADIOTHERAPY. INFLUENCE IN PROSTATE CANCER PLANNING

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Aim: To evaluate the utility and influence of 11C-choline positron emission tomography (11C-choline PET/CT) on radiotherapy planning for prostate cancer patients.

Introduction: Precise information of the extension of prostate cancer is essential for the choice of therapeutic strategy. 11C-choline PET/CT has two main roles in RT: 1) Patient selection and 2) assistance for delineation of volumes. It might allow dose escalation, in conjunction with high-accuracy techniques, while sparing healthy tissues.

Materials and methods: We have carried out a retrospective study in order to analyse RT planning modification based on 11C-choline PET/CT in 16 prostate cancer patients. All patients underwent the 11C-choline-PET/CT scan prior to radiotherapy. Patients were treated with hypofractionated step-and-shoot Intensity Modulated Radiotherapy (IMRT), or Volumetric Modulated Arc Therapy (VMAT), and a daily Cone-beam CT for Image Guided Radiation Therapy (IGRT).

Results: Re-delineation occurred in the 37.5% of cases and new dose prescription was prescrieb. Data show good clinical results in terms of biochemical control and toxicity. No Gastrointestinal (GI)/Genitourinary (GU) grade-3 toxicities was observed after a median follow-up of 14.5 months.

Conclusions: In our experience, 11C-choline PET/CT may be helpful in radiotherapy planning of prostate cancer (PCa).

18F-CHOLINE PET IN PATIENTS WITH CASTRATION-RESISTANT PROSTATE CANCER

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Aims and purposes: EORTC imaging group recommends 18F-choline PET/CT imaging (18F-Ch-PET) or MRI, as first choice for evaluation of metastatic prostate cancer. Nevertheless, few publications about this issue are available. The objective of this study was to explore the utility of 18F-Ch-PET to evaluate castration-resistant PCa patients after salvage hormonal treatment because of biologic relapse. Patients hadn't evidence of disease with other diagnostic techniques.

Material and methods: Prospective study of 6 patients with biochemical evidence of relapse of PCa after local treatment (radiotherapy, prostatectomy) that are resistant to castration and had prior negative Bone Scintigraphy and CT. Scans were performed during 2014.

Results: Average age of patients in castration-resistant time was 68 years old (61-80), average PSA at the time of the test was 24.15 ng/ml (1.99-86). Gleason score was ≥7 in all patients. Initial treatment was radiotherapy in two patients, two received prostatectomy and salvage radiotherapy, and two were treated by prostatectomy. All patients received salvage hormonotherapy. Positive 18F-Ch-PET results were obtained in 100% of studies. Local and distant disease was observed in 2 patients, regional and distance disease in 2, and distant disease in 2 patients. 3 patients were biopsied. Histological confirmation was obtained in all or them.

Conclusions: While 18F-Ch-PET is not well established as a routine test for diagnose clinical disease in castration-resistant PCa, according to our data, it seems to have better performances in comparison to conventional techniques in this stage of disease. Results of this study concur with the recommendations of the EORTC imaging group.

18F-CHOLINE PET/CT AND RESTAGING OF BIOCHEMICAL RELAPSE IN PROSTATE CANCER

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Aims and purpose: Current NCCN guidelines suggest 18F-choline PET/CT imaging (18F-Ch-PET) as a diagnostic study for evaluating patients with recurrent prostate cancer (PCa). The objective of this study was to explore the indication of 18F-Ch-PET to restage patients with biochemical relapse (BR), a controversial issue.

Material and methods: It is a prospective study (data collected between February/2014 and February/2015) in a cohort of 18 patients with BR of PCa after treatment with radiotherapy and/or prostatectomy that fulfill certain conditions (High-risk, Intermediate high-risk, Gleason ≥ (4+3) and/or PSA Doubling time <8 months). Pearson χ^2 test was performed.

Results: These are provisional results; additional data will be collected and analyzed in the final report. Positive 18F-Ch-PET results were obtained in 66.7% of the scans performed. Scans were positive in 33.3% of patients with PSA<1 ng/ml and in 100% of patients with PSA≥1 ng/ml (PSA≥1 but <2, and ≥2 ng/ml) (p=0,011). A trend is observed toward the association of positive result and Gleason score ≥8. 45.5% of patients whose initial treatment was prostatectomy were positive. In the radiotherapy group it was positive 100% of times (p=0.057). 27.8% had local and/or regional disease and 38.9% had metastatic disease, so consequent treatment was performed.

Conclusions: 18F-Ch-PET seems to be a really useful diagnostic test for restaging of recurrent PCa in selected patients. It also could modify treatment management in an important percentage, identifying which ones can be offered a potential curative treatment. In our series, like in previous literature, PSA level is a strong predictive factor for positive 18F-Ch-PET.

31CC GENE PLATFORM (PROLARIS®) AND ADJUVANT RADIOTHERAPY (ART) IN PROSTATE CANCER

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Purpose: Indication of Adjuvant Radiotherapy after prostatectomy is still a matter of discussion, Our aim has been to assess prospectively the role of a genomic platform of 31 Cell Cycle Genes (Prolaris®) in predicting the need for adjuvant radiotherapy after prostatectomy in prostate cancer.

Materials and methods: One-hundred sixty-five patients were diagnosed of prostate cancer in our institution during 2012. Those patients with low and intermediate D´Amico Risk (54 cases) were treated by prostatectomy without postoperative radiotherapy and included in the present study. Data on age, pre- and postsurgery PSA, Stage, Gleason, Perineural Invasion, and surgical margins were prospectively collected. PSA and clinical examination during follow-up was also recorded. After surgery 3 cases remain low risk, 33 resulted intermediate and 18 had high risk tumours. In all, but one, of the 54 cases we obtained a genomic profile.

Results: Almost half of the cases (46%) had lower (12) or higher (11) molecular risk than clinically expected. Nine patient relapsed (17%) and actuarial Biochemical Free Survival (BFS) was 86.6% at 2 years. Those cases with ASTRO/AUA criteria for ART (29/53) had lower BFS than properly operated patients (77% vs 100% at 2 y; p=0.008). Prolaris Score® (range -1.7-1.8) and 10y Prolaris® Estimation of BFS (range 7%-92%) predicted BFS in single Cox Regression Analysis (p=0.029 and p=0.005) respectively. Among cases with ASTRO/AUA criteria for ART, Prolaris® identified a 25% of patients (7/29) who do not need ART even with unfavourable clinical criteria.

Conclusions: The 31CCG platform Prolaris® effectively predicts BFS in prostatectomy patients and helps to decide further adjuvant treatment.

ABIRATERONA IN METASTASIC PROSTATE CANCER, ANALYSIS OF RESULTS

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Introduction: Abiraterone acetate (AA), an androgen biosynthesis inhibitor, approved for the treatment of patients with metastatic castration-resistant prostate cancer (mCRPC) has shown a benefit in quality of life, a decrease or stabilization of PSA and in overall survival pre and post-chemotherapy.

Purpose: To evaluate the response and tolerability to the treatment of the patients treated with AA in our Institution.

Materials and methods: We analyze PSA levels, clinical progression based on ECOG and visual analogic scale, all this retrospectively dates.

Results: There have been treated 34 patients with mPCRC in our institution, 18 pre-chemotherapy and 16 post-chemotherapy. Less than 50% of the patients had a PSA response mayor than 50%. However every patient experimented a benefit in pain and in quality of life. So far 17 patients had stopped the treatment, but only 2 cases because of toxicity in relation to AA. Most patients who stopped AA, did it due to a biochemical-clinical and radiographic progression. 14 patients have died and 3 are receiving chemotherapy at the moment.

Conclusions: AA seems to be an effective and well tolerated treatment for patient affected of mCRPC.

ABIRATERONE ASSOCIATED WITH A DESCENT OF PAIN IN MCRPC PATIENTS

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Introduction: It has been demonstrated that Abiraterone Acetate (AA) has improved overall survival and quality of life of patients affected of Metastatic Castration Resistant Prostate Cancer (mCRPC) in terms of a lower number of skeletal events and a prolonged period until the need of chemotherapy.

Objetive: To evaluate the evolution of the pain and quality of life of patients treated with AA in our hospital.

Methods and materials: The Visual Analog Scale (VAS), the ECOG performance status and the response of PSA is evaluated the first day os the treatment and the months after.

Results: From January of 2012 to January of 2015, 31 patients have been treated with AA in our hospital, 14 post-chemotherapy and 17 pre-chemotherapy. 54% (14) presented a VAS of 3 or more at the beginning of the treatment. From these, the mean VAS value a the beginning of AA was 5.2, and the 3 months after of 1.7. Every patient had a benefit in pain, even those that suffered a biochemical progression that experimented a benefit in the VAS scale of 3 points or more. Only 4 patients need the use of major opioids 3 months after the beginning of the treatment keeping an ECOG of 1. Only 6.4% (5) stopped the treatment because of toxicity.

Conclusions: AA is associated with a reduce of pain in patients treated in our hospital, even in those who suffered a PSA progression. Future studies should evaluate the relation between AA and the pain relief observed.

ABIRATERONE IN METASTATIC CASTRATION-RESISTANT PROSTATE CANCER

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Purpose: Androgenic way is a target in MCRPC. AB is a specific inhibitor of CYP17, blocking androgen biosynthesis. The aim was to evaluate efficacy, toxicity and quality of life (QL) in pts with MCRPC treated with AB.

Methods: Pts diagnosed of MCRPC (April 1996 - 2013), KPS>60, bone and soft tissue involvement, with/without previous Qt were included. Pts were stratified by pre/post-Qt. Efficacy and QL were evaluated. Wilcoxon test and Kaplan-Meier methods were applied.

Results: A total of 48 pts were treated with AB (4 pts were excluded). Mean age 68-yr, mean KPS 80, 84% with Gleason ≥3+4, mean PSA 84 ng/ml. 50% pts had bone metastasis alone and 20% pts had soft and bone involvement. 24 pts had pain and 10 pts had opiods before AB. Mean cycles of AB: 7. 70% pts had radiological/clinical response. AB delayed opiods 8 months. Main reason to stop AB was progression (post-Qt group). On univariate, KPS pre-AB and number of AB cycles were associated with OS, PFS, and DMS. On multivariate, KPS pre-AB was associated with OS (HR 0.23) and DMS (HR 0.26), and number of AB cycles was significantly associated with OS (HR 0.08), PFS (HR 0.13), and DMS (HR 0.08). 1 pt had grade 3/4 toxicity.

Conclusions: AB is an effective treatment in MCRPC. KPS pre-AB and number of AB cycles are significant factors on survival. Profile AB toxicity is low. AB decreased pain, delayed opiods without deterioration of KPS.

ABIRATERONE THERAPY IN PATIENTS WITH CASTRATION-RESISTANT PROSTATE CANCER: DESCRIPTIVE STUDY

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Introduction: Abiraterone (AA) opens a new therapeutic window in metastatic castration-resistant prostate cancer (CRPC).

Material and methods: Retrospective analysis of 16 CRPC patients. Kaplan-Meier (KM) survival curves from the start of the AA were generated. Median follow-up was 11 months.

Results: As initial treatment, 4 patients were treated with surgery (S) all received external beam radiotherapy (EBRT), 9 with EBRT and 3 patients had no local therapy (NLT). The median age was 72 years. The median time to the onset of lymph node, bone and visceral metastases was 67, 65 and 75; 106, 26, 52.5; and 41.5, 0 and 15.0 months in the S, EBRT and NLT group. Seven patients (43.75%) had visceral metastases located in the liver (5); lung (2); bone marrow (1), bilateral adrenal glands (1) and meningeal carcinomatosis (1). Four patients received chemotherapy: 3 prior to AA administration and one after. The median to the onset of AA from initial treatment was 100, 60 and 33 months for the S, EBRT and NLT groups. The median PSA at the start of the AA were 31, 46 and 236 ng/ml for the S, EBRT and NLT groups. There were 8 (50%) deaths from prostate cancer and only one intercurrent. The one year survival rate was 62% and 80% for the visceral and non visceral metastatic patients. The median survival was 18 months for the overall group.

Conclusions: In our experience patients treated with AA have poor prognosis clinical characteristics with a median survival of 18 months.

ACCELERATED HYPOFRACTIONATED RADIOTHERAPY FOR INTERMEDIATE-RISK PROSTATE CANCER

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Aim: Optimal fractionation and total-treatment-time (OTT) in radiotherapy for prostate cancer (PCa) remains unclear. We present the first results of efficacy and safety of an accelerated hypofractionated prospective protocol in patients with intermediate-risk PCa, assuming that fractionation and total nominal dose (NTD) would result in a biological dose-escalation and a shorter OTT maintaining acceptable levels of late toxicity.

Methods: An iso-toxic scheme to the previous of our institution (74 Gy, 2 Gy/fraction) was designed. $\alpha/ß$ ratios chosen were 1.5, 3 and 10 for tumour, rectum and bladder, respectively. CTV1: prostate + seminal vesicles, 42 Gy, 15×2.8 Gy (NTD2: 51.6 Gy); CTV2: prostate +1 cm seminal vesicles, 22.4 Gy, 8×2.8 Gy, total 64.4 Gy (NTD2: 79.1 Gy). Margins: 1 cm (0.6 cm posterior). QUANTEC constraints were converted for plan approval. 3D-CRT/VMAT and a NAL-protocol for set-up control were used. Short neaoadjuvant-adjuvant androgen deprivation was indicated. Phoenix definition and a simplified CTCAE 4.0 scale were used for assessment.

Results: Between April'11 and June'13, 72 patients with intermediate-risk PCa (T2b-T2c, GS7, PSA 10-20 ng/ml) were included. Median age was 69 years. Only 2.8% of patients required VMAT after failed to achieve constraints with 3D-CRT. Acute GU, GI, rectal and anal toxicities grade ≥2 were 12.5%, 13.9%, 29.2% and 1.4%, respectively. Median OTT was 33 days. After a median follow-up of 19 months, there was no biochemical or clinical failure. Late toxicities grade ≥2 were 5.9%, 1.5%, 16.2% and 2.9%, respectively.

Conclusions: This protocol allows an accelerated hypofractionation 79 Gy-equivalent with 3D-CRT in only 4.5 weeks, with promising outcomes with a moderate late rectal toxicity.

ACUTE TOXICITY IN PROSTATE CANCER USING TOMOTHERAPY WITH SHORT HYPOFRACTIONATION

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Introduction: Hypofractionation shortens overall treatment time and may increase the local control rate. However, it also has limitations in avoiding acute toxicity problems even with intensity-modulated radiation therapy (IMRT) technique.

Objectives: To evaluate acute toxicity using a short hypofractionation course with helical tomotherapy in low-risk prostate cancer patients.

Materials and methods: Between 2013-2015 medical and dosimetric records of patients who received treatment with short hypofractionation (56 Gy/4fractions per week) was obtained. Selection criteria include low-risk category (NCCN defined), IPSS≤12 Target volumes, normal organ contouring and constraints were performed according to standard guidelines. Acute toxicity was defined up to 6 weeks. Genitourinay (GU) and gastrointestinal (GI) toxicity was recorded in RTOG grading system.

Results: Nineteen low-risk prostate cancer patients were treated, all completed treatment without interruptions, average prostate volume was 62.3 cc, GU toxicity was GI 42.1%, GII 36.8% and GIII 16.7% respectively; GI toxicity was GI 31.57%, GII 57.8%, GIII 10.5%.

Conclusion: The combination of helical tomotherapy, image-guided radiotherapy and hypofractionation is a promising technique to reduce treatment time in patients with prostate carcinoma, and may increase QOL of patients with prostate cancer associated to a short treatment time and acceptable toxicity profile in comparison with the available data.

ACUTE TOXICITY PROFILE IN 170 HYPOFRACTIONATED TREATMENTS OF PROSTATE CANCER

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Purpose: To describe and compare acute toxicities in prostate cancer (CP) treatment between two moderate hypofractionation conformal schemes.

Methods and materials: 170 patients with CP treated from March 2009 to December 2014 were included: 129 patients received 70 Gy/28fractions/2.5 Gy/day (group I) and 42 patients received 63 Gy/21 fractions/3 Gy/day (group II) with IMRT (Novalis-Linac. An internal marker was placed transperineally, guided by transrectal ultrasound. Daily verification of marker was performed with IGRT Exactrac®, using a 6D robotic couch, an infrared camera and orthogonal X-RAYs. Weekly assessment of acute reactions was done during treatment, at one month and at 3 months using RTOG scale. Crosstab analysis was performed to evaluate differences between incidences of acute events in both schemes.

Results: In group I acute urinary toxicities were Grade 0 in 28.7%, Grade 1 in 67.4% and Grade 2 in 3.9% of patients and acute gastrointestinal (GI) toxicities were Grade 0 in 97,7%, Grade 1 in 2,3% of patients. For group two, acute urinary toxicities were Grade 0 in 41.5%, Grade 1 in 29,2% and Grade 2 in 29% and acute GI toxicities were Grade 0 in 90,2%, Grade 1 in 9,8%. The cumulative incidence for acute urinary and gastrointestinal toxicity of grade 2 was higher in group II in a comparative analysis (p=0.03). However none of the two groups reported acute toxicity ≥ grade 3.

Conclusions: Moderate hypofractionated radiotherapy (21-28 fractions) schedules are well tolerated, with minimal acute toxicity. Longer follow-up is needed to determine late impact of this acute toxicity profile.

ADJUVANT/SALVAGE RADIOTHERAPY USING DIFFERENT FRACTIONATION SCHEDULES IN PROSTATE CANCER

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Purpose: To assess the toxicity in prostatectomy patients treated with hypofractionated schedule (HFS) or conventional fractionation (CF).

Material and methods: Retrospective review of 50 prostatectomy patients treated either with IMRT (24%) or Tomotherapy (76%) as adjuvant or salvage treatment. Twenty patients with HFS (2.2, 2.4, 2.6 and 2.9 Gy/fx/d) were treated with an estimated mean BED1.5 of 171.42 Gy and 30 patients with CF were treated with mean BED1.5 of 159.65 Gy. Genitourinary (GU) and Gastrointestinal(GI) toxicities were assessed using the CTCAEv4.0.

Results: Median follow-up was 33.9 months. Percentage total of acute GI toxicity was similar in HFS and CF but acute GU toxicity was 45% vs 53.33% (p=0.046) respectively; the totals for late GI and GU toxicities for HFS vs CF were 20% vs 10% (p=0.38) and 30% vs 16.67% (p=0.26) respectively. In HFS, grade ≥2 acute GI toxicity was 10%, grade-2 late GI toxicity was 5% and grade-2 acute GU toxicity was 15%; rest of cohort cases of toxicity were grade-1. In CF, all toxicities groups were grade-1. In the subgroups analysis of HFS, grade ≥2 acute and late GI toxicities in the Group-A (2.9 Gy/fx/d) were 9% for both. Grade ≥2 acute and late GI toxicities in Group-B (2.2 to 2.6 Gy/fx/d) were 11.11% and 0% respectively. Grade-2 acute GU toxicity in the Group-A vs Group-B was 27.27% vs 0% respectively. Grade ≥2 late GU toxicity was not reported in any of the groups.

Conclusions: Our results suggest that HFS may cause a trend to increase the rate of late toxicity; but due to the low number of patients and retrospective analysis, our results should be interpreted with caution.

ANALYSIS OF PROSTATE DISPLACEMENTS: IGRT WITH GOLD FIDUCIAL MARKERS

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Purpose: We analyzed in patients with early prostate cancer treated with Intensity Modulated Radiation Therapy (IMRT) and Image Guided Radiotherapy (IGRT), the movement of the prostate in all three spatial axes.

Material and methods: We studied 40 patients with early prostate cancer, Gleason 4-7 with 4 gold seeds as intraprostatic fiducial markers. IMRT, Total planned dose: 76 Gy, 38 fractions, 2 Gy/fraction and IGRT. During the 38 sessions, each patient daily positioning of the beams was performed using two orthogonal electronic portal imaging, by adjusting the fiducial markers. Displacements were collected in 3 axes of space: lateral, longitudinal and vertical. In each axis, we collected 1520 movement. We analyze the extent of displacement in each axis with respect to the isocenter:=0, between ≥-0.1 and ≤0,1 cm between ≤0,3 and ≥-0.3 cm between ≥-0.5 and ≤0.5 cm and between ≥0,5 and ≤-0.5 cm, expressing the result as a percentage.

Results: Movement between ≥-0.1 and ≤0.1 cm. Lateral axis: 30.1%, longitudinal: 27%, vertical: 25.8%. Movement between ≤0.3 and ≥-0.3 cm. Lateral axis: 62.7%, longitudinal: 60.9% Vertical: 44.4%. Displacements between ≥0.5 and -≤0.5 cm. Lateral axis: 78.5%, longitudinal: 83%, vertical: 64.5%. Displacements in ≤-0.5 cm and ≥0.5. Lateral axis: 21.5%, longitudinal: 17%, vertical: 35.5%.

Conclusions: The vertical axis is the group in which displacement is collected greater than ±0.5 cm, about the isocenter, reaching 35.5%. The positional variability of the prostate, can only be avoided if we use control systems for daily image. With this method we increase significantly the accuracy of radiotherapy.

ANAMEM: ASSESSMENT OF COGNITIVE CHANGES IN PCA PATIENTS UNDERGOING LHRH

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Objectives and aims: The effect of androgen suppression on cognitive performance (CP) in prostate cancer (PCa) patients is unclear. Studies conducted to date have been small (18 to 57 patients) with inconclusive results. We assessed changes in CP in >300 patients during their first 6 months of treatment with luteinizing hormone-releasing hormone (LHRH) analogues.

Material and methods: An observational, prospective, multicentre, open-label study. Bicalutamide (50 mg/d) was prescribed 2 weeks before and after initial LHRH administration. CP was evaluated at baseline and 6-months of LHRH treatment with 5 neuro-psychological tests: Digit Subtest, Wechsler Adult Intelligence Scale (WAIS III-1), Matrix Reasoning Test (WAIS III-2), Visual Memory Test, Line Orientation Test, Mental Rotation of 3D Objects. Changes on the tests were considered significant when the score change was outside of the upper or lower bounds of the 95% CI. The number and percentage of patients with ≥1 CP test showing improvement were calculated.

Results: Of the initial 404 patients screened, 384 received LHRH analogues and 308 completed the study. Median age was 71. Most patient (245; 79.5%) presented no changes in CP. In patients with CP changes, most were on a single test. However, 59 patient (19.2%) experienced improvements and 57 (18.5%) worsening in ≥ one test. Correlations between baseline and 6 months measurements for each test were found to be moderate to strong and statistically significant. No differences in CP in the subgroups studied were observed.

Conclusions: Cognitive performance in PCa patients was not adversely affected by LHRH therapy over a 6-month period.

BENEFIT OF ADJUVANT RADIATION THERAPY FOR LOCALIZED PROSTATE CANCER

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Objectives: To evaluate the results of adjuvant radiotherapy after radical prostatectomy and the effect of positive surgical margin and locally advanced disease in biochemical relapse free survival (BRFS).

Methods: 113 patients were treated at our institution from January 2002 to December 2014. Overall survival and biochemical-relapse free survival were calculated using Kaplan-Meier and differences between groups were assessed using de Log-Rank test.

Results: Mean age at diagnosis was 65 years (49-74). All patients underwent radical prostatectomy combined with pelvic lymphadenectomy in 46.5% of cases. Mean time to RT was 146 days and mean preRT PSA of 0.02 ng/ml (0-3.6 ng/ml). The distribution of patients by pT stage was pT2a/b (13%), pT2c (37%), pT3 (45%) and pT4 (5%) and by Gleason Score was ≤6 in 15.5% of patients, Gleason 7 (54.5%) and Gleason ≥8 in 30% of patients. Positive surgical margins were reported in 86.1% of cases. Neoad-

juvant androgen ablation before surgery was given to 13%. Mean follow-up was 48.07 months (2-149 months). Overall survival at 5 and 10 years was 97.4% and 91.9%, respectively and BRFS at 5 and 10 years was 86.2% vs. 82.6%, respectively. When stratified by pT stage, pT3-T4 appear to have higher rate of biochemical relapse than pT2, but did not achieve statistical significance (p=0.06).

Conclusions: Adjuvant radiotherapy provides excellent long-term overall survival and BRFS in patients with high risk for local recurrence after surgery. Positive surgical margin nor pT stage were related with worse biochemical control.

BLADDER PRESERVATION BY COMBINED MODALITY TREATMENT FOR INVASIVE BLADDER CANCER

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Objectives: To analyze the results of conservative treatment in bladder cancer in terms of tumour control and toxicity.

Materials and methods: Between 2002 and 2014 we treated 29 patients diagnosed with urotelial invasive bladder cancer with combination therapy consisting of RTU, radiochemotherapy and, if needed, salvage cystectomy. Clinical features: 23 males, 6 females; mean age: 66 y; T2: 26 p, T3: 3 p; median follow-up: 3 y. Treatment: maximal RTU; radiotherapy: 45 Gy to pelvis and bladder followed by tumour boost, mean total dose: 60.6 Gy (54.8-66); chemotherapy: cisplatin (25 mg/sqm/d×4d×2 cycles, 21 p) or gemcitabine (100 mg/sqm weekly × 6 cycles, 8 p). Statistics: Kaplan-Meier.

Results: 12 p. (41%) have relapsed (5 local, 5 local+distant, 2 distant). Four out of 10 p with local relapse presented superficial tumours that were treated with RTU+intravesical therapy and remained free of disease. Five-year actuarial local control and metastases-free survivals were 61% and 77%, respectively. Cistectomy was performed in 3/10 p (30%) with local relapse. Ten-year cistectomy-free survival was 80%. Three and 5-years actuarial overall and disease-free survivals were 72% and 60%; and 61% and 50%, respectively. Age, sex, stage, type of chemotherapy and radiotherapy dose did not influence in the outcome. Only minor acute toxicity (grades 1-2) was seen.

Conclusions: Conservative treatment of bladder cancer in selected patients provides survival rates similar to those of cystectomy and allows bladder preservation in a high percentage of patients. Our results encourage us to continue with this protocol.

CHOLINA-PET/CT GUIDE SALVAGE THERAPY IN RECURRENCE PROSTATE CANCER

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Objective and purpose: Describe the F-18Fluorocholine PET/CT (cPET/TC) activity after biochemical failure in localized prostate cancer. Analyze the response to cPET/TC-guided salvage therapy.

Material and methods: N: 80 patients with cPET/TC between 2006-2012, 64 p at time of biochemical failure. At diagnosis 15 p T1, 37 p T2, 23 p T3 and 5 p T4. N0 (87.5%). Gleason score: 6: 30 p, 7: 27 p, ≥8: 20 p, missing: 3 p. Baseline median PSA 9.0 ng/ml [0.9-114.5]. Initial treatment: 45 p (56.4%) prostatectomy, 7 p (8.8%) radiotherapy, 11 p (13.8%) radiotherapy and hormones 6 months, 13 patients (16.3%) radiotherapy and hormones 2.5 years and 4 (5%) patients had hormones alone. cPET/TC -guided salvage treatments were: 23 radiotherapy (36%), 2 brachytherapy (3.1%), 8 radiotherapy and hormones (12.5%), 29 hormones (45.3%), 1 chemotherapy (1.6%) and 1 radical protatectomy (1.6%).

Results: Median time from diagnosis to cPET/TC failure: 44.03 months [2.37-126.83]. Median PSA values were 1.69 ng/ml [0.1-70.6]. cPET/TC local failure(LF) occurred in 39 patients (60.9%), nodal failure(NF) in 15 patients (23.4%) and metastatic failure(MF) in 10 patients (15.6%). With a median follow up of 55 m after rescue treatment, 15p (23.4%) had biochemical failure again. At 5 years biochemical relapse free survival (BRFS) was 65%. Overall survival 5y: 91% (median: 119 months). BRFS was 59% without LF vs 83% with LF (p 0.26). BRFS was 75% without NF vs 30% with NF (p 0.065). BRFS was 77% without MF vs 17% with MF (p 0.001). BRFS was: PSA 0.2-1: 83%; 1.1-2: 66%; 2.1-10: 39%; >10.1: 37%. p:0.02.

Conclusions: cPET detect initial local and regional relapses that can be treated with local radiotherapy with or without hormonal therapy with good results.

CHOLINE PET IN PROSTATE CANCER MANAGEMENT. OUR EXPERIENCE

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Aims and purposes: ^{18}F-choline PET/CT imaging (^{18}F-Ch-PET) allows the identification of prostate cancer (PCa) patients with biochemical relapse, that also have a limited burden of local and/or metastatic recurrent disease. The potential interest in identifying this group of patients is to offer them a curative local treatment. The objective of this study was to explore the potential of ^{18}F-Ch-PET to change management of PCa patients with biochemical relapse.

Material and methods: We analyzed a subgroup of patients from a prospective cohort. Our population was 12 patients with biochemical relapse of PCa after local treatment and with positive ^{18}F-Ch-PET. All patients were High-risk, Intermediate high-risk, had Gleason ≥ (4+3) and/or had PSA Doubling time <8 months. Studies were performed between February 2014 and February 2015.

Results: Of patients treated with radiotherapy 1 had local relapse and 4 had distant metastases. In the prostatectomy group 4 had loco-regional disease and 3 had distant metastases. After ^{18}F-Ch-PET results treatment decision was modified in 3 of 5 patients whose initial treatment was radiotherapy and in 7 of 7 patients whose initial treatment was prostatectomy. Treatment volume was modified in all patients that received salvage radiotherapy after prostatectomy.

Conclusions: In our series, ^{18}F-Ch-PET modify treatment management in 83% of patients with a positive scan and treatment volume was changed in 57%. This would result in a better therapeutic result and a better optimization of resources.

CLINICAL IMPLEMENTATION OF A SPECIAL FORM OF VMAT

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Introduction and purpose: Because the its efficiency, Volumetric Modulated Arc Therapy (VMAT) has become the standard

on the use of IMRT due to the significantly shorter delivery times. All VMAT equipment are installed on specific clinacs in which it is possible the use of gantry speed, dose rate and leaf speed fo the modulation. A recent option is available in which the VMAT calculated plan is converted on a dynamic arc plan. Our challenge is develop treatments of VMAT in Oncentra Masterplan environment delivering it in a LINAC Varian.The purpose of this work is the clinical experience of its implementation.

Material and methods: A Varian Clinac 2100CD linac accelerator with the Treatment-Planning System (TPS) Oncentra Masterplan v 4.3.0 are used. The TPS includes the Oncentra Optimizer based in a Sequential Quadratic Programing (SQP) algorithm, developed by Ray Search.

Results: Today, we are treating with VMAT radiation therapy in a Varian LINAC with an Oncentra software. The dosimetric results in prostate treatments are comparable with a seven-field dynamoc IMRT, reducing to less than half the treatment delivering time. Because we have reduced the delivering time of treatment for prostate patients, we've increased comfort for them without compromising the quality of dosimetry. Our next step is to do the same with Head and Neck patients. In this work illustrative examples with dosimetric parameters comparisons are presented.

Conclusions: The implementation of this particular VMAT technique is feasible with significant improvement on the treatments efficiency.

COMPARATIVE OF TOXICITY: RADICAL VS POSTOPERATIVE RADIOTHERAPY FOR PROSTATE CANCER

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Objective: To determinate the incidence and severity of rectal and bladder toxicity (acute and late) following EBRT (postoperative and radical) and their correlation with clinical, tumoral and dosimetric risk factors.

Methods: 333 patients were treated for prostate cancer between 2007-2010, 258 radical and 48 postoperative (39 salvage; 9 adjuvant). The mean age was 69.04 y (50-83). Clinical, tumoral and dosimetric parameters were collected. Toxicity was scored using RTOG grading system. Median follow-up was 65 months. Prior to radiotherapy, 70% prostatectomized had incontinence. Decision trees were constructed by selecting toxicity predictors according to their statistical significance. For quantitative dosimetric variables we define the optimal cutoff that maximizes the association with the toxicity.

Results: Acute urinary and rectal toxicity ≥3 was 5.4% and 1.5%, respectively. Severe late urinary and rectal toxicity was 4.5% and 2.7%, respectively. No toxicity grade 5 was observed. 27 p had hematuria and 9 p rectal bleeding that required treatment. Only 25 p (7.5%) had sequel that worsened their quality of life (cystostomy, urethral stenosis, etc). 29 patients required non-pharmacological measures to ameliorate toxicity. Bladder toxicity was related with baseline symptoms prior EBRT (p=0.029). Rectal toxicity was more frequent and severe in patients with anticoagulants and high doses (p=0.021). Significant differences were observed between patients treated with radical EBRT vs postoperative only for acute (p=0.026) and late (p=0.020) bladder toxicity.

Conclusions: Tolerance to EBRT is good and the severe toxicity is limited. Baseline urinary function is the predictive factor that most influences in late toxicity.

CORRELATION OF CCP AND KI67 IN PROSTATE CANCER AT 10-YEAR

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Purpose: Ki67 is a proliferation marker in prostate cancer. A prognostic RNA signature was developed to characterize prostate cancer aggressiveness. The aim was to evaluate prognostic correlation of CCP and Ki-67 with biochemical failure (BF), and survival in high-risk prostate cancer patients (pts) treated with radiation therapy (RT).

Methods: CCP score and Ki67 were derived retrospectively from pretreatment paraffin-embedded prostate cancer tissue of 33 men diagnosed from 2002 to 2006.CCP score was calculated as average expression of 31 CCP genes. Ki67 was determined by IHC. Single pathologist evaluated all tissues. Factors associated to failure and survival were analysed.

Results: Median CCP score was 0.9 (-0-1-2.6). CCP 0:1 pt; CCP 1:19 pts; CCP 2:13 pts. Median Ki67 was 8.9. Ki-67 cutpoint was 15.08%. BF and DSM were observed in 21% and 9%. Ki-67 ≥15% predicted BF (p=.043). With a median follow-up of 8.4 years, 10-year BF, OS, DM and DSM for CCP 1 vs CCP 2 was 76%-71% (p=0.83), 83%-73% (p=0.86), 89%-85% (p=0.84), and 94%-78% (p=0.66). On univariate, high Ki67 was correlated with BF (p=0.013), OS (p=0.023), DM (p=0.007), and DSM (p=0.01). On Cox MVA, high Ki-67 had a BF trend (p 0.063). High CCP score didn't correlated with DSM.

Conclusions: High Ki67 significantly predicted outcome and provided prognostic information. CCP score may improve accuracy stratification. We didn't provide prognostic correlation of CCP and DSM. It should be validated in a larger cohort of pts.

DOES MULTIPARAMETRIC MRI INCREASE ONCOLOGIC OUTCOMES IN PROSTATE CANCER?

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Background and purpose: To compare the 4-year biochemical disease-free survival (BDFS) of patients with prostate cancer (PCa) staged according to multiparametric MRI (mpMRI) and treated with radical prostatectomy (RP) versus intensity-modulated radiation therapy (IMRT) ≥76 Gy ± hormonal therapy (HT).

Methods: Between 2007 and 2012, 237 patients with localized-locally advanced PCa were retrospectively included in the study sample, and treated either with RP (n=120) or IMRT (n=117). Risk groups were stratified based on mpMRI results.

Results: 32.7% versus 73.5% of patients were stratified into the RP and IMRT groups respectively, using mpMRI (p<0.05). Globally, 31.7%, 53.3% and 14.1% of the PR patients and 13.7%, 51.3% and 34.2% of the IMRT patients were classified as low, intermediate and high risk, respectively (p<0.05). In patients with high-very high risk, 4 years BDFS was significantly higher in IMRT+ HT (91.4%) vs. RP (58.8%). No differences were found for low risk and intermediate risk patients. Within the entire cohort, the factors found to be associated with BDFS were the pretreatment mpMRI, Gleason score, pretreatment prostate-specific antigen (PSA), and treatment modality (p<0.05). Among the high-risk group, pretreatment mpMRI, cancer in more than 50% of biopsy cores and treatment modality were associated with BDFS (p<0.05).

Conclusions: Treatment with IMRT+HT reduces biochemical failure in high-very high risk patients compared to RP. This can be due not only to treatment modality, but also to better diagnostic accuracy through mpMRI.

EFFECTS OF IMRT ON TESTOSTERONE IN LOW RISK PROSTATE CANCER

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Background: Studies suggest that scattered radiation to testes causes changes in serum testosterone (ST). We retrospectively reviewed ST changes in patients treated with IMRT alone, and assessed correlations between dosimetric parameters for testes and ST changes.

Methods: We studied 23 patients, median age 72 (range 67-79) with low risk prostate cancer (2009-2012). Patients were treated with IMRT with total dose of 76 Gy (2 Gy/d,5d/w). We measured ST, at baseline, 3, 12 and 24 months after treatment. We calculated mean and maximum doses in testes and distance PTV-testes. T-test and Pearson correlation (PC) were used.

Results: The mean baseline ST (±SD) was 402.7 ng/dl (±173.3) and 372.0 ng/dl (±138.5), 418.9 ng/dl (±158.7), 428.1 ng/dl (±137.7) at 3, 12, and 24 months respectively. The mean and maximum testes doses (±SD) were 0.47 Gy (±0.20) and 0.90 Gy (±0.38) respectively. At 3 months, the mean ST reduction was 29.4 ng/dl (±111.3), and PC concerning mean dose and maximum dose with ST decrease were 0.24 and 0.24 respectively (p=0.2). At 12 months, 60% (12/20) of patients had recovered their basal ST as well as 61% (11/18) at 24 months. The PC didn't show statistical significance between testosterone kinetics and dosimetric parameters at 12 and 24 months. In multivariate analyses, no significant relationships were found regarding: scattered doses; total dose; distance PTV-testes or age, with testosterone recovery.

Conclusion: IMRT for localized prostate cancer leads to low doses to the testes. Despite a decline in total testosterone, it doesn't correlate with either dosimetric parameters or scattered dose in testes. More studies are needed to elucidate the prostate's role as an endocrine organ.

ESCALATED HYPOFRACTIONATED RADIOTHERAPY IN PROSTATE CANCER

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Purpose: Results of hypofractionated versus conventionally fractionated radiotherapy for prostate cancer have recently been published in large phase 3 trials. We report preliminary data on local control, acute and late gastrointestinal/genitourinary toxicity in our series treated with dose-escalated hypofractionated radiotherapy.

Methods: Between January 2011, and December 2014, 320 prostate cancer patients have been treated in our department. A dose of 60 Gy in 20 daily fractions of 3 Gy within 4 weeks was prescribed to the prostate or prostate plus seminal vesicles if T3b stage. Volumetric Modulated Arc (VMAT) or three-dimensional conformal radiotherapy (3D-CRT) was used with daily kV cone beam CT (XVI) to verify patient position. Short-term androgen deprivation therapy (ADT) were prescribed in 30.9% of patients, long-term ADT were prescribed in 21.8% patients and 45% did not received ADT. Distribution by stage: 20.5% low-risk, 30.9% intermediate-risk; 33.6% high-risk, 14.1% very high-risk.

Results: With a median follow up of 24 months, reported acute genitourinary toxicity was G-0 23.5%, G-I 45.5%, G-II 29.1%, G-III 0.9%. Acute gastrointestinal toxicity was G-0 80.5%, G-I 14.1%, G-II 4.1%, G-III 0%. 5 years Local Control: 98.2%

Conclusions: Dose-escalated hypofractionated radiotherapy in prostate cancer provides an acceptable toxicity profile with a good local control and shorter overall treatment time. Longer follow up is needed in order to report data on late toxicity.

EXPERIENCE WITH ABIRATERONE IN PATIENTS WITH CASTRATION-RESISTANT PROSTATE CANCER

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Objectives: To describe our experience in implementing a treatment protocol with abiraterone acetate in prechemotherapy indications in patients with castration-resistant prostate cancer. Assess the safety and response to treatment.

Material and method: Prospective, descriptive study of a cohort of five patients with castration-resistant prostate cancer treatment with abiraterone acetate in pre-chemotherapy indication. We have implemented in our department a protocol of monitoring every two weeks during the first three months and then monthly. The radiological control is performed at six months or when there is worsening of symptoms. All patients studied were asymptomatic or minimally symptomatic at the start of treatment.

Results: With a maximum fourteen-month follow-up of the five patients continue treatment without signs of disease progression. They presented a good tolerance while maintaining or improving the quality of previous life. During the follow-up protocol one patient diagnosed with Barret disease has refered increased gastric symptoms.

Conclusions: Treatment with abiraterone acetate in pre-chemotherapy indication is safe and effective in controlling symptoms and quality of life of patients in our series. Due to the short follow-up of our patients and the small sample size we can not confirm the data obtained in monitoring the progression of the disease.

EXTERNAL BEAM RADIATION THERAPY IN TREATMENT OF PARAGANGLIOMA

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Objective: Evaluating the role of radiotherapy in the paraganglioma.

Material and methods: 19 year-old patient with family precedent: uncle died by metastatic pheochromocytoma. With a personal precedents of hemophilia B and factor IX deficit. An increasing of catecholamines and metanephrines was detected in a hypertension study. An I-123 MIBG visualized a hyperintensity area in right hemipelvis. In MRI found retroperitoneal lymph nodes and several right iliac tumors which were affecting pelvic floor and bladder. These tumors were resected and a partial cystectomy was performed. The pathological anatomy was compatible with multifocal paraganglioma with a lymph node involved, vascular invasion and infiltration of the edge of bladder resection. He is derived to radiotherapy to valuation adjuvance. He received external radiotherapy treatment from RapidArc: two isocentric arcs with full rotation and 6 MV photons. Treatment volume is surgical bed and pelvic nodal regions, receiving 50 Gy, with standard fractionation.

Results: Nowadays, the patient continue reviews in our service, achieving local and symptomatic control.

Conclusions: Paragangliomas primary bladder represent a 6% of all paragangliomas and a 0.06% of the bladder malignant tumors. Histologically there is no difference between benign and

malignant, the only malignancy indicator is the appearance of metastases, which are observed in the 15% of bladder paragangliomas The treatment of choice is surgical. Radiation therapy and chemotherapy are indicated in cases with unresectable or residual tumor. Some retrospective studies show symptomatic improvement and local control in more than 80% of the cases with adjuvant radiation therapy.

EXTERNAL RADIATION-THERAPY VERSUS BRACHYTHERAPY IN LOW RISK PROSTATE CANCER. RECAP-DATABASE ANALYSIS

Pastor Peidro, J.R.; López Torrecilla, J.; Jové Teixidó, J.; González San Segundo, C.; Cabeza Rodríguez, M.A.; Villafranca Iturre, A.E.; Collado Ballesteros, E.; Gómez Caamaño, A.; Muñoz Garzón, V.; Vallejo Ocaña, C.

Objectives: The guidelines consider external radiation therapy (ERT) and brachytherapy (BT) valid options in radical treatment of low risk prostate cancer patients. We analyse and compare overall survival (OS), biochemical relapse free survival (BRFS), metastases free survival (DMFS), cancer specific survival (CSS) and toxicity in two treatment options.

Material and methods: Multicenter retrospective comparative study of 1.341 low risk prostate cancer patients treated 986 with ERT and 355 with brachytherapy (31 HDR and 324 LDR). We used data from the RECAP database (November 1994-December 2013) and described clinical control and toxicity (RTOG/EORTC and CTCAE scoring) results. Descriptive statistics, survival estimates determined by Kaplan-Meier and comparisons of survival rates were performed using Log-rank test.

Results: The median follow up was 58.9 months (73.2 m in ERT-group and 24.2 m in BT-group). The median of ERT doses was 74 Gy (56-80 Gy) and median CTVprostate-D100 in BT-group 130.3 Gy (9.5-151.7 Gy). The 5-years results was: OS 92.7% vs 99%, BRFS 90.3% vs 89.2%, DMFS 98.8% vs 99.4% and CSS 99.3% vs 100% in ERT group and BT-group respectively. There were statistically differences in genito-urinary, haematuria and rectal bleeding worst in ERT. In BT-group there was 2 dead by haematuria. No grade 5 toxicity in ERT-group.

Conclusions: ERT and BT are very effective in the treatment for low risk group patients without differences in cancer control. The toxicity seems slightly worst in ERT group. But the follow up and number of patients is so different between two treatments.

HDR BRACHYTHERAPY MONOTHERAPY ONE FRACTION 20.5 GY FOR TREATMENT PROSTATE CANCER

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Background: Evaluate the technical feasibility, acute and late genitourinary (GU) and the gastrointestinal (GI) toxicity after high dose rate (HDR) brachytherapy as monotherapy in one fraction with transperineal hyaluronic acid injection into the peri-rectal fat to displace the rectal wall away from the radiation sources in order to decrease rectal toxicity.

Material and methods: Between May 2011 and April 2014, 52 consecutive patients were treated with favourable clinically localized prostate cancer; the median follow-up was 17 months (range 6-41). All patients received one implant and one fraction of HDR. Fraction dose was 20.5 Gy. Toxicity was reported according to the Common Toxicity Criteria for Adverse Event, Version 4.0 (CTAE v4.03) by the National Cancer Institute.

Results: All patients tolerated the implantation procedure very well with minimal discomfort. No intraoperative or perioperative complications occurred. Acute toxicity grade 2 or more was not observed in any patients. No chronic toxicity has been observed after treatment. The 41 months actuarial biochemical control was 100%.

Conclusions: This protocol is feasible and very well tolerated with low genitourinary morbidity, no gastrointestinal toxicity and the same level of LDR biochemical control at 41 months.

HIGH-DOSE RADIOTHERAPY AND LONG-TERM ANDROGEN DEPRIVATION IN LOCALIZED PROSTATE CANCER

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Background: The optimal duration of androgen deprivation (AD) combined with high-dose radiotherapy (HDRT) in prostate cancer remains undefined. We aimed to determine whether long-term AD (LTAD) is superior to short-term AD (STAD) when combined with HDRT.

Methods: Multicentre, phase 3 randomized trial. Eligible patients had cT1c-T3bN0M0 prostate adenocarcinoma with intermediate- and high-risk factors according to NCCN criteria. 355 patients were randomized to receive 4 months of neoadjuvant and concomitant AD (STAD) plus HDRT (median dose 78 Gy) or the same treatment followed by adjuvant AD for 2 years (LTAD). Stratification was according to risk group. The primary endpoint was biochemical disease–free survival (bDFS). Secondary endpoints included overall survival (OS) and metastasis-free survival (MFS).

Results: From 2005 to 2010, 178 patients were randomized to STAD and 177 to LTAD. After a median follow-up of 63 months, the 5-year bDFS was significantly higher among patients receiving LTAD (90% vs. 81%; HR 1.88 95% CI 1.12-3.15; p=0.01). Five-year OS and MFS were also significantly higher in the LTAD group (OS 95% vs. 86%; [HR 2.48 95% CI 1.31-4.68; p=0.009] and MFS 94% vs. 83%; [HR 2-31 95% CI 1.23-3.85; p=0.01]). Radiation toxicity was similar in both groups. Stratified analysis showed that the benefit in bDFS, MFS and OS was only significant in patients with high-risk disease.

Conclusion: Compared with STAD, 2 years of adjuvant AD combined with HDRT improved biochemical control and overall survival in patients with high-risk prostate cancer. Longer follow-up is needed to determine the benefit from >4 months in intermediate-risk disease.

HYPERBARIC OXYGEN TREATMENT FOR THE MANAGEMENT OF LATE RADIATION TOXICITY

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Objectives: To evaluate the effectiveness of hyperbaric oxygen in patients with chronic radiation toxicities at different locations.

Patients and methods: 21 patients diagnosed of late toxicity in our centre (January 2009-December 2014)were treated with hyperbaric oxygen. Late toxicity by radiation therapy consisted in ulcers and radionecrosis in 6 patients with head and neck tumors, and cystitis and proctitis in 15 patients with abdominal tumors. Before hyperbaric oxygen were conducted, patients received other treatments with steroids enema, sucralfate, argon laser, analgesics, hyaluronic acid, antibiotics, etc.

Results: Median age 63 (range 35-82); Gender male 15 and female 6. These patients developed toxicity with a median of

32 months (1-120 months). Median radiation doses were 66 Gy for head and neck tumors and 76 Gy for pelvic tumors. The toxicities described in these patients due to radiotherapy were: cystitis in 6 patients, proctitis in 6 patients, 2 patients had both toxicities. Only one patient had enteritis(gastric carcinoma). 4 patients with head and neck tumors had radionecrosis and 2 patients had ulcers. The median number of sessions needed to control symptoms was 40. Total response percentage was 50% for head and neck tumors and 86.6% for pelvic tumors. Median follow up was 33 months (range, 1-104 months). One patient needed to repeat this treatment and three had to receive other treatment for symptomatic control. No mayor complications were reported.

Conclusions: The treatment with hyperbaric oxygen is feasible, cost-effective and non-toxic for chronic radiation toxicity management. Therefore, we recommend hyperbaric oxygen to be used previously to other invasive treatments.

HYPOFRACTIONATED POSTOPERATIVE RADIOTHERAPY IN PROSTATE ADENOCARCINOMA. ACUTE TOXICITY

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Objective: To report the acute toxicity appeared in irradiated patients with hypofractionated regimen following radical surgery for Prostate Cancer.

Material and methods: 28 patients were analyzed. Mean age was 66.6. All of them were adenocarcinoma and treated with radical surgery.Prostatectomy with lymphadenectomy 53%, only prostatectomy 47%. Gleason score was in 57% of cases greater in surgery than biopsy. Gleason 6: 7%; Gleason 7: 54%; Gleason ≥8: 39%. Tertiary pattern 5: 21%. Bilateralism: 86%. Perineural invasion: 96%. Vasculo lymphatic invasion: 14%. Media dissected lymph nodes: 12.3. Stages: pT2c (25%), pT3a (50%), pT3b (25%). All pN0. Margins +57%. Adjuvant radiotherapy in 43% of cases. Salvage 57%. Of these patients prior to radiotherapy PSA<1: 38.5%, 1 to 2: 25%, and greater than 2: 12.5%. Range 0.27-16.3 ng/ml. Incontinence after radiotherapy grade 0: 38.5% grade 1: 27%, grade 2: 34.5%. All of them received 58.8 Gy daily fractions of 2.8 Gy, 5 sessions per week, 72 Gy BD2, on bed of prostatectomy exclusively using IMRT and IGRT daily (CT) and administered treatment with Rapid Arc (85%) or Tomoterapia (15%). 57% of patients receiving hormonal treatment, none more than six months.

Results: Acute genitourinary toxicity grade 1: 64%, grade 2: 3.5%. Gastrointestinal toxicity Grade 1: 29%, not greater toxicity. Grade 1 Anal: 7%.

Conclusion: In our series postoperative hypofractionated radiotherapy is safe, and the acute toxicity is no higher than conventional fractionation.

HYPOFRACTIONATION AND STANDARD RADIOTHERAPY IN PROSTATE CANCER NON-RANDOMIZED COMPARISON STUDY

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Purpose: To compare acute complications in radical EBRT for prostate cancer (CP) using hypofractionation IMRT-IGRT (Hypo-IMRT-IGRT) versus 3D-standard fractionation (3D-RT) regimen. Hypo-IMRT-IGRT was designed to minimize toxicity and reduce overall time of treatment.

Methods and materials: 247 patients with CP who underwent radiotherapy in January 2011 from December 2014 were evaluated. This double arm study consisted of 170 patients treated with Hypo-IMRT-IGRT using internal marker (ExacTrac-X-Ray system) delivered in 21 fractions/3 Gy (42 patients) or in 28 fractions/2.5 Gy (128 patients) with median overall treatment time of 33 days versus 77 patients managed with standard fractionation, 3D-RT and 78 Gy in 55 days (39 fractions/2 Gy). Differences between Hypo-IMRT-IGRT and 3D-RT included fractionation and margins (hypo-IMRT-IGRT margins 7 mm and 3 mm, for all but posterior margins respectively; 3D-RT margins 10 and 5 mm, for all but posterior margins, respectively). Genitourinary and Gastrointestinal acute effects were scored according to RTOG-EORTC criteria. Crosstab analysis was performed.

Results: No rectal acute complication grade 2 was reported in Hypo-IMRT-IGRT versus 3.9% grade 2 in 3D-RT group (p=0.01). Maximal urinary acute toxicity was Grade 2 in 10% hypofractionated arm and 22% in standard group (p=0.03). There were no statistical differences of acute rectal complications between patients treated with 3 Gy vs 2.5 Gy/fraction. None of the groups reported events ≥ grade 3.

Conclusions: Our results showed no increased incidence of acute complications when Hypo-IMRT-IGRT was employed additionally the total treatment time is reduced by almost half. Further investigation is needed to exclude bias related to lack of randomization.

HYPOFRACTIONATION IN PROSTATE CANCER AS STANDARD TREATMENT. A COST-BENEFIT ANALYSIS

Pérez Echagüen, S.; Sanz Freire, C.J.; Ossola Lentati, G.A.

Introduction: Prostate cancer and normal surrounding tissues show differential values of the alfa-beta ratio which support hypofractionation. The gain in therapeutic ratio allows a dose escalation to the tumor. Non-inferior clinical results of hypofractionation vs. normofractionation have been clearly established. Therefore, under a favorable cost-benefit analysis, hypofractionation should be considered the standard of treatment.

Objective: To conduct a comparative cost-benefit analysis of economic, resource allocation and social-emotional gain of hypofractionation vs. normofractionation.

Material and methods: Two treatment schemes were considered, both IMRT and daily-CBCT-IGRT delivered. Initially, 78 Gy-82 Gy were delivered at 2 Gy/fx. Since October 2010, 191 hypofractionated treatments were delivered. Two hypofractionated schedules were followed: HF1 features 27fx at 2.6 Gy/fx. HF2 features 20fx at 3.15 Gy/fx. The goal was to reach 82 Gy-EQD2. HF1 was also used for SIB if pelvic lymph-node irradiation was indicated. Training in CBCT-IGRT for the RTTs was carried out by a Radiation Oncologist.

Results: 73 HF2-treatments and 118 HF1-treatments were delivered (92HF1-SIB). Non-inferior short and middle-term local control rates and similar toxicities were obtained compared to the normofractionated arm. Similar medical physicist resources and allocated time slot per-fraction were used. A net gain of time slot per-patient, RTTs resources, regular medical and nursery consultations, medical and pharmaceutical expenses, ambulance transportation, CBCT extra-dose, was demonstrated. Moreover, patient fatigue, mental exhaustion, familiar-social or occupational disruption, transport related expenses, improved with hypofractionation.

Conclusions: In the context of a non-inferior therapeutic choice, the cost-benefit analysis shows overwhelming advantages of hypofractionation. Thus, hypofractionation should be considered the standard of treatment in prostate cancer.

INCIDENCE OF INTESTINAL TOXICITY IN PROSTATE CANCER PATIENTS UNDERGOING RADIOTHERAPY

Sanchez Sanchez, E.; Del Castillo Acuña, R.; Orellana Salas, A.

Introduction: The intestinal and urinary toxicity are the most common secondary effect in patients with prostate cancer who undergo radiotherapy. These effects cause a lower treatment tolerance, with possible interruptions, and decreased quality of life.

Objective: To determine the incidence of intestinal toxicity in patients with prostate cancer who will undergo radiotherapy.

Material and methods: A cross-sectional study was performed in a period between January 2014 and February 2015. The total dose administered was 74-76 Gy with a daily fractionation of 2 Gy. Weekly toxicity controls were registered including the presence of intestinal toxicity as diarrhea, tenesmus or proctitis. All patients during the first contact with the unit receive the same care information to be carried out to prevent the presence of toxicity, including dietary restrictions and the use of rectal hyaluronic acid.

Results: A total of 71 patients with prostate cancer were studied, with a mean age of 69.08±7.05 years. Of these, 16.1% had diarrheas, 33.8% rectitis and 8.4% rectal tenesmus. None of the patients have all three symptoms simultaneously, with enteritis and rectal tenesmus most frequently associated, by 9.5%.

Conclusions: Preventive care reduces the incidence of intestinal toxicity in patients receiving radiotherapy for prostate cancer.

INFLUENCE OF ANDROGEN DEPRIVATION TREATMENT WITH HYPOFRACTIONATION IN PROSTATE CANCER

Chávez Zeballos, A.; Chehal, A.; Nagore, G.; Tisaire, J.L.; Gonzalez, J.A.; Matute, R.; Azinovic, I.

Purpose and objective: To evaluate if concomitant androgen deprivation treatment (ADT) influences radio-toxicity with a hypofractionation schedule in prostate cancer.

Materials and methods: Retrospective review of 72 patients with localized prostate cancer treated with IMRT or 3D-EBRT. Twenty patients received ADT for 4-6 months (Group-A) and 52 patients did not receive ADT (Group-B). ADT was prescribed mainly in intermediate risk group. All cases were treated with a dose total of 67.5-70 Gy to 2.5 Gy/fx/d in 27-28 fractions. Genitourinary (GU) and Gastrointestinal (GI) toxicities were assessed using RTOG scores.

Results: Median follow-up was 34.7 months. Total acute GI toxicity for Group-A vs Group-B was 30% and 26.91% (p=0.79) and late GI toxicity was 15% vs 21.15% (p=0.64) respectively. Acute GU toxicity for Group-A vs Group-B was 30% and 21.15% (p=0.069) and late GU toxicity was 10% vs 15.38% (p=0.15) respectively. Grade≥2 acute GI toxicity for Group-A vs Group-B was 25% vs 19.22% and for GU toxicity was 10% vs 17.3% respectively. Grade≥2 late GI toxicity was 10% vs 7.69% respectively and GU toxicity was 10% vs 9.62% respectively. No patient in Group-A with Grade≥2 acute GI toxicity developed late toxicity vs 60% of the patients in Group-B. 11% of the patients in Group-B with Grade≥2 acute GU toxicity developed late toxicity vs 50% in Group-A.

Conclusions: From our experience, ADT does not influence in GI and GU toxicity. Due to the low number of patient and the retrospective analysis our result should be interpreted with caution.

INTEROBSERVATOR VARIABILITY WITH CBCT MV AND FIDUCIAL MARKERS

Salas Buzón, M.C.; De Ingunza Barón, L.M.; Gutiérrez Bayard, L.; Villanego Beltrán, I.; Díaz Díaz, V.; González Calvo, E.; Díaz Goméz, L.

Purpose: The aim of the study was to determine the interobserver variability in 3D volumetric images: Megavoltage Cone Beam CT with fiducial markers and IGRT.

Material and methods: In a serie of 40 patients with localized prostate cancer who had inserted four gold seeds as fiducial marks, five radiation oncologists have made the verification "off -line" in five random images extracted from five different randomly selected patients to determine interobserver variability, when adjusting the CBCT using gold fiducial markers. We have determined the correlation between different evaluators' measures by calculating the intraclass correlation coefficient (ICC), in each space axis.

Results: At lateral displacement, correlation coefficients for each pair of reviewers are above 0.95. The ICC: 0.963(95% CI: 0874-0996) and the test of significance (relative to 0) F=132.748 and p<0.0001. ICC value: agreement is very good. In longitudinal displacements, correlation coefficients for each pair of evaluators, are higher than 0.90. The ICC: 0.958 (95% CI: 0856-0995) and the test of significance (relative to 0) F=114.230 and p<0.0001. ICC value: agreement is very good. In vertical displacements correlation, coefficients for each pair of evaluators exceed 0.95. The ICC: 0.978 (95% CI: 0922-0997) and the test of significance (relative to 0) F=224.0 p<0.0001.ICC value: the agreement is very good.

Conclusion: With trained medical staff, despite the difficulties of adjustment (matching) of gold fiducial seeds between the reference image of CT and MV CBCT, interobserver variability is very small, being slightly higher in the longitudinal axis, although not clinically significant.

INTRA-FRACTION MOTION ANALYSIS IN PROSTATE CANCER PATIENTS: PRELIMINARY RESULTS

Montemuiño, S.; Rodríguez, B.; Pardo, J.; Aymar, N.; Ortiz, I.; Jiménez, E.; Ariño, A.; Font, J.; Alastuey, I.

Objective and purpose: To analyze the intra-fraction prostate and organs at risk movements; and evaluate the relationship with treatment time in prostate cancer patients undergoing IMRT radiotherapy.

Materials and methods: Fourteen successive cancer patients were enrolled. Radiotherapy treatment was delivered with a Varian CLINAC DHX High Performance linac with Integrated OBI system. During a total of 43 IMRT treatment sessions, a CBCT pre and post-treatment were performed. By the Offline Review of Aria network, in the images obtained three separate evaluations were made: for PTV (Planning target Volume), rectum and bladder are made respectively. Also, the elapsed time between the two CBCT was recorded. Total displacement was calculated as the square root of the squares of the displacements in each length.

Results: The average treatment time is 10.42±1.6 minutes and displacements of the three structures evaluated. The largest displacements occur in the vertical and longitudinal direction. Rectum is the organ with the bigger movements while the PTV is the one with the smaller displacements.

Conclusion: For a long time, pelvic organ motion during radiotherapy has been in debate. Our study shows that movement of prostate is small but not negligible. Our limitation is that we can only observe intrasession movement at the end of the session and not during it. Treatment with the minimum possible duration is recommended, to reduce uncertainties associated with intrasession movements. In order to increase and improve statistical sample, recruitment of patients continues.

LOCAL TREATMENT IN CASTRATION-RESISTANT PROSTATE CANCER: A CASE REPORT

Marbán Orejas, M.C.; Rodríguez Melcón, J.I.; Blanco, A.; García Cabrera, L.; León, P.; Blanco Suárez, J.M.; Mejía, D.; González Machín, G.; Artiles, J.L.; Lara, P.C.

Background: Initial treatment in metastatic castration-resistant prostate cancer (CRPC-M1) includes chemotherapy and sec-

ond-line hormone therapy, but therapeutic options in CRPC-M0 are limited and investigational. We present a CRPC-M0 patient who developed a rapid biochemical progression after hypofractionated radiotherapy with regional nodal relapse.

Case report: A 59y male diagnosed in May'12 of high-risk PCa (GS 4+4, PSA: 19.75 ng/ml, cT2cN0M0). Between December'12 to January'13 received EBRT: Pelvis 46 Gy 23×2.0 Gy + hSIB prostate + seminal vesicles 64.4 Gy 23×2.8 Gy (NTD2=79.1 Gy) plus ADT for 36 months. A sustained castration-level of testosterone was achieved. Three months after EBRT, a 0,16ng/ml PSA-nadir was reached. Eight months later, biochemical failure was detected with a PSA level of 6,50 ng/ml (PSA-DT: 1.2 months). Bicalutamide was then started, without response. Staging workup with CT-scan and bone scintigraphy found only a 2.4 cm external iliac lymph-node. The case was discussed in a Tumour Board and SBRT vs. surgery were proposed as salvage options. PET-CT ^{18}F-Choline was recommended to rule-out further disease, which confirmed the existence of single nodal lymph metastases as only disease. Left pelvic lymphadenectomy was performed on June'14 (PSA 31.82 ng/ml), with 2 out of 8 nodes affected by tumour. Pathologic and immunohistochemical tests (AE1-AE3 cytokeratins and PSA) supported its primary origin as PCa. Ten days after surgery a PSA of 1.72 ng/ml was obtained, and it lowered to 0.01 ng/ml two months later.

Conclusions: CRPC is a heterogeneous entity, with both castration-resistant and hormone-sensitive clonogens. CRPC-N+ patients may benefit from a salvage regional treatment although impact in OS remains uncertain. Further studies are needed.

LONG TERM OF ACETATE ABIRATERONE TREATMENT. A CASE REPORT

Davila Piñeiro, E.

Objective: Efficacy and tolerance of long term treatment.

Method: We present a patient with metastatic prostate cancer treated with abiraterone acetate from April 2012 since December 2014 objectifying complete biochemical response, stability of bone metastases and radiation response of lymph node metastases.

Results: It was found the efficacy and tolerability of long term treatment as well as it has improved quality of life.

LONG TERM TOLERANCE OF HYPOFRACTIONATED TREATMENT FOR PROSTATE CANCER

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Introduction: Considering that the a/b ratio for prostate tumors is low, we could yield a clinical benefit by increasing the dose per fraction, since tumor cells show greater sensitivity to fractionation than adjacent organs at risk.

Purpose: Assessment of long-term tolerance in patients treated with hypofractionated radiotherapy in our Center. Assessment of PSA levels in the first and second years.

Methods and material: Between January 2010 and January 2014, 78 men were treated at the Jaén Hospital, with ages comprised between 46 and 77 years old (average 68 years old), KPS 90-100%. They were diagnosed with prostate adenocarcinoma. PSA between 4 and 188 (average 14.5 ngr/ml), Gleason 6 (64%), 7 (22%), 8 (8%), 9 (5%), clinical stage cT1c (64%), cT2 (17%), cT3 (19%). 76% of concomitant treatments with androgen blockade.

Results: The administered dose was from 69.9 to 75.9 Gy (average 74.3 Gy), in a fractionation of 2.3 Gy per day, five days a week, with 7 fields (97%) shaped three-dimensionally and 18 MV photons. We used the CTVv3 to scale proctitis and cystitis radioinduced, 6 months after the end of treatment, every 3-6 months. We considered the Biologically effective dose to fraction of 2.3 Gy to evaluate Histograms dose/volume to rectum and bladder, be aware of V60<40%, maximum dose in rectum and bladder 75 Gy and 80 Gy respectivily. The tolerance after monitoring for a minimum of 6 months (7 to 36 months, average 15 months) was excellent, showing gastrointestinal toxicity: G0 in 88%, G1 in 7% and G2 in 5%. In a genitourinary level it was G0 in 90%, G1 in 10%. PSA was determined one year after completed in 61 patients. 2 patients developed distant disease. 14 patients without androgen blockade maintained PSA average of 1.31 ngr/ml. 50 patients with androgen blockade had PSA average of 0.25 ngr/ml. PSA was monitored in 20 patients after 2 years. 6 of them without androgen blockade with a PSA average of 1.17 ngr/ml. The other 14 with androgen blockade and PSA average of 0.07 ngr/ml.

Conclusions: The hypofractionated treatment shows an excellent medium-term tolerance. Greater monitoring is needed to determine the long-term effects and ensure its effectiveness in locoregional control.

LONG-TERM RESULTS OF HIGH-DOSE IG-IMRT FOR CLINICALLY LOCALIZED PROSTATE CANCER

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Aim: High-dose radiotherapy for prostate cancer (PCa) has shown an improved BFFS with a moderate increase in late toxicity. In 2005 a high-dose IMRT protocol was started with the hypothesis that an 8 Gy increase over standard dose would improve outcomes without increasing toxicity by using daily US-based IGRT. A previous prospective cohort (n=117) treated with 3D-CRT at 70 Gy was used for comparison.

Methods: Between September'05 and April'09, 107 patients were treated with step&shoot IMRT with daily IGRT. The protocol included two dose levels (74 and 78 Gy) and androgen deprivation (ADT) according to NCCN classification. When indicated, seminal vesicles and pelvic lymph-nodes received 62.4 Gy 1.6 Gy/fraction (SIB) and 45 Gy 1.8 Gy/fraction (3D-CRT). Margin to prostate ± seminal vesicles was 0.9 cm (except 0.5 cm posterior). For toxicity and biochemical evaluation, RTOG/EORTC scales and Phoenix definition were used.

Results: Median follow-up for IG-IMRT group was 6.5 years and median dose was 78 Gy. IG-IMRT group had significantly worse disease features than 3D-CRT group (intermediate/high-risk: 91.6% vs. 70%, p<0.0001). 89.7% of patients received ADT. IG-IMRT allowed a safe 8 Gy dose-escalation, even with a significantly lower acute GU toxicity ≥2 (14.5% vs 4.7%, p=0.014). Late GU and GI toxicities ≥2 were similar in both groups. Dose escalation improved 5y-BFFS rates in 10.2% and 8.3% for intermediate and high-risk, respectively (90.9% vs. 80.7%, p=0.137; 77.6% vs. 69.3%, p=0.525).

Conclusions: High-dose IG-IMRT achieved a clinically -but not statistically- relevant increase in the actuarial 5y-BFFS in intermediate and high-risk PCa patients, with the same late toxicity.

MAGNETIC RESONANCE'S VALUE IN THE DIAGNOSIS OF PROSTATE CANCER RECURRENCE

Domingo, C.; Maroñas, M.; Alcalá, M.; Castilla, J.F.; Ciafre, A.; Pinazo, J.; Jordà, E.; Algás, R.; Ferrer, E.

Objective: Reviewing the use of magnetic resonance (MRI) for prostate cancer recurrence compared with the literature.

Material and methods: This is a single institution retrospective review of fifty-five patients with prostate cancer (PC) who underwent radical prostatectomy (RP) between 2001 and 2011.

We select them because of biochemical recurrence (BR) during his follow-up. Patients were stratified following RTOG criteria. Thirty (54.5%) patients were classified at intermediate-risk PC. After RP, sixteen of them changed to high-risk group and three to low-risk. Twenty-one (38%) patients had positive margin and twenty-two (40%) patients had no detectable PSA. We observed BR between the following 6 to 108 months after RP. MRI included multiple sequences and was realized in all patients. External beam radiation therapy was established as a salvage treatment. Average dose of 67.16 Gy was reached to surgical bed and doses up to 73.3 Gy to those with suspicious nodule by image plus concomitant hormone blockage therapy.

Results: MRI detected recurrence in 20% of patients (11/55): local recurrence in ten of them and one with regional lymph nodes. Average volume of recurrence was 13.36cc and average size was 20.45 mm in largest dimension; similar measures have been observed compared with the literature.

Conclusions: MRI has a low sensitivity and specificity for BR after RP. Results are independent to RTOG group, margins or the post-surgical PSA value. However, new prospective studies should be made to determinate the most useful sequences of MRI to diagnose early recurrence.

METASTATIC PROSTATE CANCER: RADIATION THERAPY IN MALIGNANT PERICARDIAL EFFUSION

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Malignant pericardial effusion secondary to prostate cancer is a rare entity, with few published reports. We describe a case of malignant pleural and pericardial effusions due to metastasic hormone-refractory prostate cancer treated with short- course radiation therapy with good symptomatic relief.

Case report: A 64 year old patient presented in March 2010 with T2c-3 N0M0 gleason grade 4+5 prostate adenocarcinoma, after a screening prostate specific antigen (PSA) level 17.74 ng/ml. He was initially treated with high dose brachytherapy (HDR) (15 Gy)+external beam radiotherapy (46 Gy)+ complete androgen blockade. In August 2012, he presented dyspnea, double PSA level and progression of the disease with bone metastasis. He received 6 cycles of docetaxel with good response. In March 2014, he developed perciardial effusion complicated by tamponade, being treated with percutaneous pericardial drainage, followed by an intravenous course of docetaxel, achieved a poor response. After a surgical pericardiectomy in July 2014, this patient was treated with 30 Gy of 3D conformal beam radiotherapy, with no acute toxicity and a satisfactory relief of clinical symptoms, such as dyspnea. Radiation therapy should be applied in pericardial metastases with pericardial effusion if surgery is not feasible and prior chemotherapy has failed, and comparing with repeated periocardiocentesis, can achieve dyspnea improvement with acceptable toxicity. This case suggests that patients with pericardial tamponade due to hormone-refractory protate cancer do not have uniformly poor prognosis and should be considered for aggressive treatment to achieve successful symptomatic results.

MULTICENTRIC STUDY OF PERMANENT BRACHYTHERAPY IN YOUNGER PATIENTS WITH PROSTATE CANCER

Villafranca, A.E.; Fernandez, P.; Martínez-Monge, R.; Gutierrez, C.; Sola, A.; Collado, E.; Herruzo, I.; Hervas, A.; Muñoz, V.; Muñoz, J.

Purpose: To evaluate biochemical progression-free survival (BDFS) in men 60 years of age or younger with prostate cancer who underwent exclusive permanent brachytherapy.

Methods: 528 p with LR/IR. T1:423p T2: 105 p; Gleason 6: 520 p, gleason 7: 8 p; neoadyuvant hormonotherapy: 48 p; initial PSA≤10: 492 p>10: 36 p. Md follow-up 63 m (1-173 m). BDFS was defined ASTRO definition. Patients were selected from RECAP database, helped by URONCOR and GEG groups.

Results: Dosimetry: pD90: md147 Gy (45-215 gy); pD90>165 Gy: 19.8%; pd100: md86.2 Gy; pV150: md 54.6% prostate volumen: 36 cc (14-93 cc). D10 urethra: md 142% (112-191%); D2cc rectum: 79.2%. Toxicity: Acute: genitourinary: g2: 6.1%; g3: 0.6%; rectal: g2: 20%, g3: 3.7%. Late: genitourinary: g2: 7.7%; g3: 4.6%; rectal: g2: 2%, g3: 0.5%. Both were related with pV150: Acute GUg≥2: 71.7% (pV150>50%) vs. 28.1% (50%) vs. 18.2% (165 Gy: 92.5% (HR: 1.47, p: 0.46).

Conclusions: This is one of the biggest series at the moment in younger men with permanent brachytherapy. Patients 60 years of age or younger have a high probability of 10-year BDFS. There is a trend to get better results with D90>165 Gy.

MULTIPLE CONCURRENT FRACTIONATION IN THE SAME THERAPEUTIC PLAN. IT'S THE FUTURE?

Iglesias Agüera, A.; Mata, F.; Escolar, P.; Puchades, V.

Objectives: The context of the current radiotherapy moves in terms of IMRT and VMAT, far away is the 3D RT. This work is only one example about the possibilities that these new technologies offer us, asking ourselves unthinkable treatments for years about multiple concurrent fractionation.

Material and methods: The case of a 79 years old man diagnosed with stage IV prostate adenocarcinoma (T3bN1M1) by retroperitoneal lymph node involvement. The treatment plan: androgen deprivation therapy and radical treatment of prostate, vesicles seminal, plus boost level affected lymph nodes and retroperitoneal pelvic lymph node regions. Four subdivisions are prescribed: prostate + VVSS: 70 Gy (2.5 Gy fraction). Pelvic lymph node regions: 50.4 Gy (1.8 Gy/fraction). ParaAo chains: 46.2 Gy (1.65 Gy fraction). Boost affected lymphadenopathy Pa Ao: 56 Gy at 2 Gy/fraction. VMAT technique of Rapid Arc.

Results: Acute toxicity: urinary toxicity and gastrointestinal toxicity G1. OARs: Bladder V40: 47%, V60: 24%.Dmed: 46.2 Gy. Recto: V40: 50%, V60: 18%. Dmed: 46.57 Gy. Intestine: V45: 113 cc. Right kidney: Dmed: 11 Gy, left kidney: Dmed 11 Gy.

Conclusions: The multiple concurrent fractionation maintain a low dose OR and facilitates good tolerance to treatment without detriment to the dose to the target volume. But we must question how far it is convenient, practical and cost effective in terms of benefit in disease control and survival, time planning and time machine of this type of complex treatments. We wonder, this is the future of a radiation dose gradients?

NEXT STATION: ADAPTIVE RADIOTHERAPY (ART) IN PROSTATE CANCER

Muelas Soria, R.; Bonaque Alandí, J.; García Mollá, R.; Conde Moreno, A.J.; Ferrer Albiach, C.

Purpose: To evaluate if planned dose for rectum and prostate using volumetric arc therapy/image-guided radiotherapy (VMAT/IGRT) are equal to the dose really delivered. We present an analysis of CTV (prostate ± seminal vessels) and rectum variations in a 15×3.82 Gy schedule and the impact on HDV´s, showing ART scenarios.

Methods and materials: For 15 patients, a plan-CT (pCT) and 9 treatment Kilovoltage conebeam-CT (kvCBCT) scans per patient were acquired during the first three weeks of a prostate lGRT treatment (150 CTs). A rectal emptying preparation and full bladder protocol were used. Firstly a deformable image registration (DIR) with RayStation treatment planning system was made from the pCT to each kvCBCT, and then revised and recontoured by a

Radiation Oncologist, establishing control regions of interest for a second DIR. Finally a hypofractionated VMAT schedule (15×3.82 Gy) was planned and correlated with kvCBCT images, enabling to determine doses which would have been actually delivered.

Results: An interim analysis (five patients) shows a significant difference in D2 CTV planned and delivered (p=0.0119) and a not yet significant difference between D98 CTV (p=0.1749) and average rectal kvCBCT volume and pCt volume (p=0.2106). Depending on the rectum HDV planned there is a 2 Gy positive or negative deviation.

Conclusions: There are substantial differences in CTV dose prescribed and really delivered. Rectum variations instead of control strategies are high, especially during the first week, being critical for more hypofractionated schedules. ART should be used in patients with significant dose variations.

OTT AND CHARLSON-SCORE IMPACT ON TOXICITY OF IMAT-SIB FOR INTERMEDIATE/HIGH-RISKPCA

Najjari, D.; Ferrer, F.; Mendez, G.; Chiruzzi, C.; Boladeras, A.; De Blas, R.; Galdeano, M.; Pera, J.; Picon, C.; Guedea, F.

Purpose and objective(s): To explore if overall treatment time and Charlson score were prognostic factors for toxicity in patients with intermediate or high-risk prostate cancer treated by intensity IMAT with SIB.

Materials and methods: One-hundred-forty consecutive patients, diagnosed with intermediate or high risk prostate cancer, were treated. Data on comorbidity was recorded in order to calculate Charlson score. The IMAT plans were designed to deliver 60 Gy (2 Gy/fraction) to the prostate, seminal vesicles plus margin while delivering simultaneously to the prostate plus margin 70.8 Gy in 30 fractions (2.36 Gy/fraction). Univariate and multivariate analysis with logistic regression were performed. CTCAEv3.0 morbidity scores were used to assess toxicities.

Results: Median follow-up period was 14.8 months. Median Charlson score was 4. All patients received the prescribed delivered between 36 to 57days. Median radiation OTT was 47 days. One biochemical relapse was observed. Acute genito-urinary toxicity was observed in 81% of patients with maximal score of 2 in 40.9% of patients. Charlson score greater than 4 do not predicted increase in toxicity. Rectal acute toxicity grade 2 with mucosal discharge was present in 17.6%. Acute rectal toxicity risk is increased by 2.3 fold in the shorter OTT. Late rectal toxicity Grade 3 was seen in one patient and 5 more patients showed grade 2 score. Chronic urinary toxicity grades 1-2 were observed in 27.5% of patients, but only two patients with grade 2.

Conclusion: Shorter OTT seems to increase the risk of acute rectal toxicity. Charlson score should not be considered as predictor factor for toxicity.

OUTCOME OF SALVAGE RADIATIOTHERAPY AFTER PROSTATECTOMY FOR BIOCHEMICAL RELAPSE

Domínguez-Rullán, J.A.; Muñoz, T.; Candini, D.; De la Pinta, C.; Sancho, S.; López, F.; Vallejo, M.C.; Polo, A.; Hervás, A.

Objectives: To determinate the factors related to outcome in patients presenting biochemical relapse after radical prostatectomy treated with salvage radiotherapy.

Methods: 174 patients were treated at our institution from January 2002 to December 2014. Overall survival and biochemical-relapse free survival were calculated using Kaplan-Meier and differences between groups were assessed using de Log-Rank test.

Results: Mean age at diagnosis was 63.4 years (41-74). All patients underwent radical prostatectomy combined with pelvic lymphadenectomy in 40.8% of cases. Mean time to RT was 36 months (4.9-148.5) and mean preRT PSA of 0.85 ng/ml (0-12.8 ng/ml). The distribution of patients by pT stage was pT2a/b (40.8%), pT2c (35.1%), pT3 (17.8%) and pT4 (0.6%) and by Gleason Score was ≤6 in 31% of patients, Gleason 7 (57%) and Gleason ≥8 in 12% of patients. Positive surgical margins were reported in 37.4% of cases. Neoadjuvant androgen ablation before surgery was given to 52.4%. Mean follow-up was 52.47 months (4.4-156 months). Overall survival at 5 and 10 years was 99.3% and 94.5%, respectively and BRFS at 5 and 10 years was 68.8% vs. 52.1%, respectively. Gleason Score, pT stage and PSA preRT were significantly related with biochemical free survival.

Conclusions: Salvage radiotherapy for biochemical relapse after surgery provides aceptable biochemical control. Patients with worse pathologic profile and PSA pre-RT>1 ng/ml had higher rates of biochemical recurrence, but positive surgical margin, androgen deprivation nor time to RT under 24 months were significant predictors.

PATIENT´S PROFILE WITH CPRC TREATED IN OUR HEALTH AREA

Peleteiro, P.; Formoso, I.; Carballo, A.; Torrado, L.; Farjardo, I.; Sosa, P.; Varela, A.; Taboada, B.; Calvo, P.; Gómez, A.

Objectives: To define the patient's profile with CRPC treated in our health area.

Material and methods: 66 patients with CRPC were selected with pharmacological treatment from 2014/01/01 to 2015/02/15. Information collected from two intrahospital sources.

Results: The main tumor features at diagnosis were: PSA<20 in 27 patients and ≥200 in 13 patients. Gleason ≥8 in 42.4%. 40.9% of them were metastatic. The median time of developing castrate resistance, by measuring the interval of diagnose-resistance, was of 3.8 years and 2.4 years with the interval of the hormonal therapy beginning.-resistance. After becoming CRPC, 90.9% had bone metastasis, 40.9% lymph node and 9% visceral metastasis. 90% either didn't have symptoms or showed pain controlled with analgesia. As first-line treatment, 34 patients received Docetaxel, 17 received Abiraterone, 7 Cyclophosphamide and 8 patients received other treatments. 17 patients progress with this first-line treatment. 6 patients received more than fourth- line treatment. Since the approval of the prescription with Abiraterone prior to chemotherapy, these patients are managed by ORT and Urology Services.

Conclusions: The tumor features at diagnosis were very diverse. It is remarkable that once it becomes CRPC, 90% of the patients either didn't have symptoms or showed controlled pain. There is an increase in treatments with Abiraterone in the latest cases, which correspond to the participation of ORT and Urology Services in this treatment.

PATIENTS TREATED WITH ABIRATERONE ACETATE IN DEPARTMENT OF RADIATION ONCOLOGY

López-Honrubia, V.; Fernandez-López, J.; Murria, Y.; Solis, I.; Sabater, S.; Andrés, I.; Sevillano, M.M.; Villas, M.V.; Aguayo, M.A.

Abiraterone Acetate (AA) is indicated as a treatment for metastasis castration-resistant prostate cancer.

Material and method: A retrospective analysis of 9 patients treated with AA in the Radiation Oncology Department (2013-2014) based on data collected from clinical records.

Results: The average between the diagnosis of disease and early treatment with AA was 6years (average age 75.6 years). 66.6% has been treated with radical therapy. The management of other patients with Androgen Deprivation Therapy (ADT) was due to the extent of disease at diagnosis. Eight out of the nine

patients started treatment with ADT, where five of them were treated with radical radiotherapy. Only one patient was operated at diagnosis (+ external radiotherapy for biochemical failure 12 months later). No patients had received prior Docetaxel, not being indicated yet when starting treatment with AA. The main cause of starting the treatment was the metastasis bone disease (66.6%), while the local progression and lymph node or visceral disease are secondary causes. The most common symptom reported by patients during treatment was fatigue. Five patient still continued with treatment in November 2014 (average duration 6.4 months). The cause of the termination of the treatment in 2 of the cases was the progression; in one of the cases was due to a poor tolerance to corticosteroids and there was only one case resulted in death during treatment due to other causes.

Discussion: Most patients reported clinical improvement but some patients had received other therapies (palliative radiotherapy/analgesics). We need to continue to monitor and select more patients to report definitive results.

PILOT PROSPECTIVE STUDY: WB-DWI-MRI VS CHO-PET/CT IN METASTATIC PROSTATE CANCER

Conde-Moreno, A.J.; Herrando-Parreño, G.; Muelas-Soria, R.; Broseta-Torres, R.; Ferrer-Rebolleda, J.; Cozar-Santiago, M.P.; Ferrer-Albiach, C.

Purpose: To determine the effectiveness for detection of metastases of Whole Body-DWI-MRI vs Choline-PET/CT in patients with biochemically recurrent prostate cancer (PCa), and to select those who could benefit from SABR (olimetastatic patients) as well as evaluating the response to it.

Methods and materials: After approval of the ethics committee, PCa were enroled in a controled prospective-pilot-study. All read by experienced radiologis/nuclear-medecin, blinded from the other studys. Analysis of correlation by statistical kappa (κ) was performed. After SABR we performed again correlation within.

Results: 20 patients were enrolled. Medians: age 69 years, PSA of 0.78 ng/ml and testosterone 0.52 ng/ml at the studies. Bone-Scan: seven presented wih 18 bone metastases. CT-scan was negative in all. Location in the Cho-PET/CT: iliac/sacroiliac lymph-nodes 29.41%, 17.64% bone metastases, intraprostatic lesions 11.76% and 17.64% extrapelvic lymph-nodes. In WB-DWI-MRI, bone: acetabulum 11.76%, sacroiliac/pubic 17.65%, sacrum 11.76%, spine 11.76% and lymph-node 5.88%. Cho-PET/CT allowing detect lesions in 9 patients, who are not observable in the WB-DWI-MRI. There is agreement in 6 and only in 2 cases had WB-DW-MRI imagines not been observables in the Cho-PET/CT. The kappa (κ) obtained was of -0.1065 so that the correlation between tests is poor, the p-value is not significant, so the null hypothesis of $\kappa=0$ is accepted. Besides the value of $\kappa<0$ indicates that the mismatch is less than expected by chance.

Conclusion: There is no agreement between results of WB-DWI-MRI and Cho-PET/CT, latter allowing increased detection of no significant lesions on WB-DWI-MRI, especially in lymph-node metastases.

POSTOPERATIVE RADIATION THERAPY AFTER RADICAL PROSTATECTOMY

Domínguez-Rullán, J.A.; Candini, D.; De la Pinta, C.; Muñoz, T.; Vallejo, M.C.; Sancho, S.; López, F.; Polo, A.; Hervás, A.

Objectives: To compare the results of adjuvant and salvage radiotherapy after radical prostatectomy and to determine prognostic factors of biochemical relapse free survival (BRFS).

Methods: 302 patients were treated at our institution over a 12-year period. Overall survival and biochemical-relapse free survival were calculated using Kaplan-Meier and multivariate Cox regression analysis was used to assess differences between groups.

Results: Mean age at diagnosis was 65 years (42-80). All patients underwent radical prostatectomy combined with pelvic lymphadenectomy in 47.1% of cases. Adjuvant RT was performed in 113 patients and salvage RT in 183 (9 for local recurrence). The distribution of patients by pT stage was pT2a/b (30.3%), pT2c (35%), pT3 (29%) and pT4 (2.3%). Upgrade in Gleason score between biopsy and prostatectomy was experienced by 46.7% of patients. Positive surgical margins were reported in 56.5% of cases. Neoadjuvant androgen ablation before surgery was given to 36.5%. Mean pre-RT PSA of 0.46 ng/ml (0-12.8) and mean dosis to surgical bed of 70 Gy (60-76 Gy). Mean follow-up was 58.85 months (1-153 months). Overall survival at 5 and 10 years was 98.1% and 94.3%, respectively and BRFS at 5 and 10 years was 76.5% vs. 61.8%, respectively. The timing of RT (ART vs. SRT) and pre-RT PSA<0.5 ng/ml are significant predictors of longer BRFS.

Conclusions: Postoperative radiation therapy provides excellent long-term overall survival with an aceptable BRFS with pre-RT PSA<0.5 ng/ml and adjuvant RT as predictors of better outcomes.

PREDICTIVE FACTORS FOR APPEARANCE OF CASTRATION-RESISTANT PROSTATE CANCER AT DIAGNOSIS

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Introduction: The objective of this study is to assess the impact of castration-resistant prostate cancer (CRPC) and find possible predictive factors at the moment of diagnosis that might influence the appearance of CRPC.

Methods: The size of the final sample consisted of 281 patients. A forward Cox-model of regression was created with four variables and the adjusted-hazard ratios (HR) were obtained. The goodness-of-fit was obtained through a score test. This model was transformed into a point system through the Framingham methodology. The ABC of the system was calculated and the following cut-off points were determined: Optimum and High risk. Risks groups' were defined and their associated likelihoods of resistance were calculated. Curves of survival were represented through the Kaplan-Meier technique and each of the 3 groups was compared using log-rank test.

Results: Out of 281 patients with prostate cancer, 41 suffered from castration resistant prostate cancer (14.6%, 95% CI: 10,5-18,7%). The arithmetic mean of the follow-up was 71.2±34.5 months. The predictive factors of resistance to castration were: T3-T4 (HR=1,40, IC 95%: 0,69-2,84, p=0,351), M1 (HR=9,59, IC 95%: 4,68-19,63, p<0,001), Gleason A ≥4 (HR=3,04, IC 95% CI: 1,49-6,21, p=0,002) and high PSA (for each 10 ng/ml) (HR=1,01, IC 95%: 1,00-1,02, p=0,002).

Discussion: The statistical analysis shows clearly evidence for these results (high sensibility and specificity, with AUC=0,84). These results are consistent with the clinical evidence since patients with the highest risk were those who already had worse prognosis and therefore, less likelihood of developing CRPC.

PROGNOSTIC FACTORS RELATED TO PROGRESSION IN CRPCM TREATED WITH ABIRATERONE

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Purpose: Abiraterone is the indicated forefront metastatic castration-resistant prostate cancer (CRCPm) treatment for asymp-

tomatic or mildly symptomatic patients as well as in post-chemotherapy. It is currently prescribed until progression of disease. Our aim is to identify patterns of progression and prognostic factors related which can help identify strategies to be followed in these cases.

Methods and materials: We retrospectively analysed 41 patients following Abiraterone, 8 pre-chemotherapy and 33 post-chemotherapy. Mean onset age of treatment with Abiraterone was 73.3 years. PSA at diagnosis showed a median of 28 ng/ml and the median PSA at the beginning of Abiraterone was 69.7 ng/ml. When starting Abiraterone, metastasis number was only 1 location in 4 patients, from 2 to 5 locations in 4, and in the remaining patients multiple metastases appeared. The median follow-up was 8.5 years.

Results: Median time to progression with Abiraterone was 280 days. 36% of patients had radiographic oligoprogression. Patterns: node progression in 3 patients, 12 with bone progression, bone and lymph node progression in 3 and exclusive visceral progression in 1. PSA increase was observed in 17 patients. PSA nadir with Abiraterone resulted lower in patients who did not progress to Abiraterone and higher in those who had metastases exclusively located in lymph nodes, statistically significant.

Conclusions: Current data has not detected statistically significant prognostic factors associated with progression patterns. Periodic follow-up with imaging diagnosis techniques seems necessary to determine them. Further studies of strategies to control localized progressions while the remaining disease responds to Abiraterone are warranted.

PROSPECTIVE STUDY WITH MODERATE HYPOFRACTIONATION IN PROSTATE CANCER: PRELIMINARY RESULTS

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Background: To evaluate feasibility and acute toxicity of a moderate hypofractionated intensity modulated radiotherapy (Hypo-IMRT) schedule for localized prostate cancer (PC).

Methods: Between April 2012 to December 2014, 42 patients (median age, 70 years) with NCCN criteria defined: 14 low, 22 intermediate and 6 high risks were treated with moderate hypofractionated radiotherapy. Median PSA pretreatment was 9.45 ng/ml (range 2.11-85.39 ng/ml), median clinical stage was T1c, and a median Gleason score of 6. Intermediate and high risk patients received androgen suppressive therapy. Internal marker was placed transperineally guided by transrectal ultrasound. All patients received 63 Gy in 21fx (3 Gy/day) with IMRT (Novalis-Linac). Daily verification was performed with IGRT-Exactrac®, and 6D-robotic couch. Acute toxicity was assessed according to RTOG/EORTC criteria.

Results: All patients received complete treatment. There were no complications during marker placement. At an 11 months median follow-up (range 2-37 months) the RTOG/EORTC acute urinary toxicities were grade 1 in 27%, grade 2 in 30%. Maximal acute gastrointestinal toxicities were grade 1 in 8%. There were no events ≥ grade 3. Late toxicities were seen in 37 patients. Urinary toxicities grade 1 and 2 were 18% and 8% respectively. GI toxicities grade 1 was 5%. No later toxicities ≥ grade 2 have been reported. No biochemical relapses nor distant metastases were diagnosed.

Conclusions: Moderate Hypofractionation Intensity Modulated (63 Gy/3 Gy/fraction/21 fractions) with IGRT and internal markers is feasible and well tolerated. Longer follow-up is needed to determine late impact of this low rate of acute toxicity.

PROSTATE CANCER IN PATIENTS YOUNGER THAN 50 YEARS OLD

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Objective and purpose: Conflicting data exist about the behaviour of prostate cancer in patients younger than 51 years old, unlike in breast cancer patients.

Material and methods: Between 2006 and 2009, nineteen patients with an age under 51 years were diagnosed with prostate cancer in our hospital. We compared them with a group of 52 patients older than 69 years diagnosed in 2005 and 2006.

Results: Mean age was 47.8 (minimum 41 years) and 73 years (maximum 81 years) for each group. Of 17 evaluable patients in the younger group, 83.2% (14 patients) were treated with surgery and 16.8% (3 patients) with radical radiotherapy vs 10% (5 patients) and 45% (23 patients), respectively in the older group ($p<0.0001$). Seven patients (50%) treated with surgery in the younger group received adjuvant radiotherapy because of adverse prognostic factors. The risk group distribution was: 56.2% (9 patients) high risk, 18.7% (3 patients) intermediate risk and 25% (4 patients) low risk vs 65%, 18% and 17% ($p=0.15$ NS) respectively. Eight patients (53%) in the younger group had a biochemical relapse vs 26% (5 patients with radical radiotherapy; $p=0.28$). Overall survival at 5 years was 100%% for the younger group and 76% in the elderly group.

Conclusion: These results do not allow to conclude whether this tumor is more aggressive in younger patients despite the higher percentage of biochemical recurrence. There were no differences between the different prognostic groups. A high percentage of young patients required adjuvant radiotherapy because of adverse prognostic factors.

PROSTATE CANCER TREATED WITH DIFFERENT-ESCALATED DOSE TECHNIQUES: LATE G3 GI TOXICITY

Rodriguez Villalba, S.; Depiaggio, M.; Marín López, J.; Rivado Ortega, Y.; Richart Sancho, J.; Otal Palacin A.; Perez Calatayud, J.; Santos Ortega, M.

Purpose: A retrospective analysis in 368 consecutives prostate cancer patients (PC) (September 2004-December 2013) have been made, for evaluating the Late G3 Gastrointestinal (GI) toxicity of different multimodality radiotherapy approaches including escalated dose (ED) in intermediate risk (IR) and High risk (HR).

Methods and materials: Our protocol has been designed according to uniformity on the risk classification of PC with ED. We employ IGRT-EBRT exclusively or Low dose rate Brachythrapy (LDR BT) exclusively in low-risk (LR) patients, EBRT combined with LDR-BT or High dose rate (HDR) BT for Intermediate-risk patients (IR) and EBRT combined with HDR-BT for High-risk patients (HR). The doses prescribed are:

— IGRT exclusive: 72 Gy 18 pts, 75.6 Gy 31 pts, 79-81 Gy, 72 pts for LR, IR and HR respectively.
— LDR BT exclusive: 160 Gy, 59 pts.
— EBRT + LDR BT: 45 Gy (Prostate, seminal vesicles) + 110 Gy, 83 pts.
— EBRT + HDR BT: 60 Gy (Prostate, seminal vesicles) + 9.5-10 Gy in IR, 35 pts. 50.4 Gy (pelvis) + 2 fractions of 9.5 Gy in HR 70 pts.

Results: At the time of this analysis, the median follow up was 60 months (range 14-125 mo). GI toxicity grade 3 has been developed in 20 p (7%) treated with IGRT and, 3 patients of the group of EBRT and HDR (0.7%) being in all cases resolved with Argon.

Conclusions: In our experience, combination modalities with BT techniques escalating dose achieve more intensity treatments with a low G3GI toxicity mainly in patients treated with HDR.

PROSTATE CANCER: ACUTE URINARY RETENTION WITH HYPOFRACTIONATION AND VMAT TREATMENT

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Objectives and purpose: Moderate hypofractionation and dose escalation using VMAT to treat Prostate Cancer is a technique in vogue. We wanted to determine the incidence of acute urinary retention (AUR) in patients treated with hypofractionation and VMAT.

Material and methods: Data were analyzed from 74 patients diagnosed with prostate cancer treated with Hypofractionation or Normofractionation and VMAT between the years 2013 - 2014. Variables that have been evaluated were: T, Age, Prostate volume, Gleason, Dose, IPSS, PSA and Target volume; p value was obtained from Kruskal-Wallis test and Fisher test for the Target volume. For the relationship between PSA and acute urinary retention we used the mean and quartiles. 20 patients were treated after prostatectomy to 2 Gy/fraction until 70-72 Gy and the remaining 54 were treated to 2.5 Gy/fraction until 70 Gy.

Results: 5 events were detected, corresponding to 6.76% of the total patients. 3 of these patients were treated after prostatectomy (60% total events). No statistically significant relationship was found between AUR and the studied variables in hipofractionation treatments. There has been an increased tendency with major IPSS (mean 8.6, p=0.1769), and also with the target volume (0% if only prostate, 3.6% prostate and seminal vesicles, 4.5% including lymph nodes) in these patients.

Conclusions: Moderate hypofractionation with VMAT and dose escalation in the treatment of Prostate Cancer is a well tolerated technique (2.7% AUR).

PSA LEVEL IN PROSTATE CANCER PATIENTS TREATED WITH RADICAL TREATMENT

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Objectives: To evaluate the influence of PSA level in biochemical disease-free survival (BDFS), disease free survival (DFS), cancer specific survival (CSS) and overall survival (OS) after radiation therapy plus androgen deprivation therapy (ADT) in patients (pts) with prostate cancer (PCa).

Materials y methods: Retrospective comparative study of 317 pts with PCa with PSA level ≤0.1 ng/ml (127 pts) vs >0.1 ng/ml (190 pts) after RT plus ADT from October 2001 to June 2010. Baseline characteristic were similar in both groups. Median total radiotherapy dose was 76 Gy. Phoenix definition was used for biochemical failure. Kaplan-Meier curves were used for statistical analysis of survival and the long-rank test for the comparison of the survivals. Prognostic factors such as age, primary tumor stage, Gleason and ADT Prognostic factors such as age, primary tumor stage, Gleason and ADT have been related to BDFS, DFS, OS and CSS using Cox regression.

Results: The median follow-up was 79 months for pts with PSA level ≤0.1 ng/ml and 75 months for >0.1 ng/ml (p=0.021). The 10-year BDFS, DFS, OS and CSS for PSA≤0.1 ng/ml were 89.5%, 89.2%, 86.5% and 99.2% respectively and for PSA>0.1 ng/ml were 83.3% (p=0.021), 80.8% (p=0.014), 73% (p=0.614) and 99.4% (p=0.776) respectively. In the multivariant analysis only age and high risk group was significant predictor of OS. In both groups the majority of pts had acute and late genitourinary and gastrointestinal toxicity grade 1-2.

Conclusion: PCa pts reaching a PSA level ≤0.1 ng/ml after RT+ADT has significantly higher BDFS and DFS than pts with PSA level >0.1 ng/ml after treatment.

QUALITY OF LIFE IN CANCER OF PROSTATE PATIENTS AFTER RADIOTHERAPY

Sanz, A.; Yélamos Agua, C.; González, J.A.; Nagore, G.; Tisaire, J.L.; Abejar, R.M.; Moreno, O.; Azinovic, I.

Aims and purpose: Analyze the quality of life of patients with prostate cancer treated with two different forms of radiotherapy (brachytherapy and external beam radiotherapy).

Material and method: Quality of life is evaluated by applying Expanded Prostate Cancer Index Composite (EPIC) questionnaire, version Spanish which assesses specific aspects of prostate cancer and its treatments: urinary, bowel, sexual and hormonal function as well as overall satisfaction. Between 2008-2013, all patients were contacted by telephone to explain the study. Patients were treated between in our Units in Alicante, Alcázar de San Juan and Seville.

Statistical analysis and results: The sample consisted of 119 patients with prostate cancer treated in the IMO group units divided into two groups by the treatment received: Group 1 (brachytherapy): 41 patients aged between 52 and 83 years, mean age of 64.7. Group 2 (external beam radiation): 78 patients aged between 54 and 89 years, mean age and an average age of 68.27. Statistical analyses were carried out using SPSS of version 20.0 for Windows. With a sample t tests, we compared the EPIC scores our sample with the population of test validation to the Spanish. Independent sample t test was used to compare the quality of life according to the type of radiotherapy (BQ and RTE) used.

Conclusions and implications: Quality of life is inside PRO measures that allow knowing the satisfaction of our patients and the needs during and after the application of cancer therapies. Within the clinical benefit, results in the quality of life may be determinant for the choice of the treatment strategies.

RADIOTHERAPY IN HIGH RISK LOCALLY ADVANCED PROSTATE CANCER

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Objective and purpose: The role of local treatment like radiotherapy (RT) for patients diagnosed with high risk prostate cancer (HRPC) is not exempt from controversies. We reviewed retrospectively our experience in this kind of patients.

Materials and methods: We defined HRPC as any patients with level of PSA ≥50 ng/ml. In this way, 61 patients, diagnosed between 2002 and 2013, were reviewed retrospectively. The treatment consisted of neoadyuvant androgen deprevation (AD) 3-6 months, RT dose ≥70 Gy and adjuvant AD for ≥2 years.

Results: The median of follow-up was 69 months. The median age was 66 years old (range 44-76 years). The majority of patients had Gleason score of 7 (47.2%) and T2b (27.8%), N0 (97.2%), M0 (97.2%) prostate cancer. The median of level of PSA was 87.2 ng/ml at diagnosis and 0.96 ng/ml after neoadjuvant AD. At the end of the study 54.3% of patients were alive without evidence of failure treatment neither biochemical nor clinical, 14.3% of patients had biochemical failure but without clinical failure and 17.1%

had clinical failure. The 5.7% of patients died because of tumour and 8.6% died because of others diseases.

Conclusion: Our results confirm the positive impact of the RT doses ≥70 Gy and long term adjuvant androgen suppression, in locally advanced prostate cancer with a high rate of biochemical failure-free survival and metastases failure-free survival.

RIGID AND DEFORMABLE PELVIC REGISTRATION ACCURACY RELATED TO THE TABLETOP SHAPE DURING MAGNETIC RESONANCE IMAGING

Sabater, S.; Pastor, M.R.; Berenguer, R.; Andres, I.; Lozano, E.; Sevillano, M.M.; Jimenez-Jimenez, E.; Fernandez-Lopez, J.; Lopez-Honrubia, V.; Arenas, M.

Introduction: Diagnostic MRI (MRI-DX) scans are performed on curved couches, so patient position differ from RT position.

Purpose: To verify registration accuracy of the rigid and deformable registration of pelvic MRI-DX related to MRI scans acquired with flat tables (MRI-RT).

Material and methods: Six prostate cancer patients underwent T2 weighted MRI in two different positions with identical MRI parameters with a flat tabletop (MRI-RT) and curved couch (MRI-DX). A rigid registration followed by a b-spline registration was performed. The MRI-RT and two sets produced after rigid (MRI-rigid) and deformable registration (MRI-def) were compared. Prostate and rectum were segmented on every image set. Volume differences using 3D vectors, Hausdorff distance (HD) and the Dice similarity coefficient (DSC) were computed.

Results: All image metrics showed significant differences between rigid and deformed images related to RM-flat (all p=0.028). No significance was seen for median 3D prostate vectors nor 3D rectal vectors. DSC did not show significant differences for prostate. Significance was seen for rectal DSC (median, rigid, 0.7828; deformable, 0.9054, p=0.028) and 95% prostate and rectal HD distance (median prostate, rigid, 3.135; deformable, 2,255; p=0.028; median rectum, rigid, 4,005, deformable, 2.655, p=0.028).

Conclusions: Additional studies are need before to use images acquired with curved couches on RT treatments.

RISK FACTORS FOR TOXICITY IN HYPOFRACTIONATED PROSTATE CANCER RADIOTHERAPY

Chehal, A.; Lopez Guerra, J.L.; Chavez, A.; Nagore, G.; Tisaire, J.L.; Gonzalez, J.A.; Matute, R.; Mateo, M.; Sanchez-Reyes, A.; Azinovic, I.

Purpose and objective: We report our experience with hypofractionated radiotherapy (RT) in prostate cancer delivered without using image-guided RT.

Materials and methods: The study includes 129 patients with localized prostate cancer treated with hypofractionated RT from 2008 to 2013.There were 66% patients who had low risk disease and 34% had intermediate risk disease. In addition, 35% patients received hormonal therapy for 4-6 months in combination with RT.All cases were treated with 70 Gy at 2.5 Gy per fraction, delivered with intensity modulated RT (IMRT) in 86% of cases.

Results: The median age was 70 years (54-89) and the median follow up was 48 months.The biochemical control rate was 98%. The rates of acute grade 2 gastrointestinal (GI) and genitourinary (GU) toxicities were 2% and 10%, respectively. The rates of acute grade 3 GI and GU toxicities were 2% and 6%, respectively. IMRT associated with less acute toxicity for both GU and GI systems than three-dimensional conformal RT (3DCRT; OR: 0.13, p=0.003). Older patients (≥75 years old) experienced less severe (grade≥3) GU and GI toxicity than younger patients (OR: 3.42, p=0.05). Additionally, the RT technique and the age also associated with the risk of moderate and severe (grade≥2) GU toxicity. Patients treated with IMRT had a lower risk than those treated with 3DCRT (OR: 0.16, p=0.004) and older patients had a higher risk than youngers (OR: 3.18, p=0.05). Finally, there was no grade 4 or 5 toxicity.

Conclusions: Our findings suggest that IMRT and younger patients achieve an excellent outcome when using hypofractionated RT with less toxicity compared with those treated with conventional 3DCRT or older patients, respectively.

SALVAGE BRACHYTHERAPY FOR RECURRENT PROSTATE CANCER AFTER PREVIOUS RADIATION TREATMENT

Rodriguez Villalba, S.; Richart Sancho, J.; Otal Palacin, A.; Depiaggio, M.; Perez Catalayud, J.; Ballester, F.; Santos Ortega, M.

Objectives: We presented a retrospective analysis in 11 patients with histological proven local-recurrent prostate cancer, undergoing salvage brachytherapy (BT), treated between February 2009 and December 2014.

Material and methods: Four patients have been rescued with 125I permanent seed implant (LDR) and seven with High-Dose-Rate-BT (HDR). Previous treatments were: 3 LDR (145 Gy), one combined treatment with external radiotherapy (EBRT) (45 Gy) and LDR (100 Gy), and 7 EBRT (68-74 Gy). LDR patients received 145 Gy with 125I. HDR patients, has been treated with 30 Gy in 3 fractions of 10 Gy separated ten days. Median time to Biochemical failure (BF) from the first treatment was 48 months (12-114). All patients received previous hormonotherapy. Median time to rescue was 69 months (33-156). Toxicities were evaluated according with CTC scale (version 4).

Results: Median follow-up: 26.5 months (3-72). The overall survival time was 98 months (65-174). At the end of the follow up, February of 2015, all patients are alive, nine (82%) without evidence of disease, one patients had a retroperitoneal failure 7 months after the salvage-BT and other patient was diagnosed of a solitary bone metastases at 12 months. Median PSA nadir post-salvage-BT was 0.1 (0-0.29). There were not grade 3 GU or GI toxicities. 100% of LDR patients presented acute GU-toxicity grade 2. Fifty-seven % of the HDR patients had GU-toxicity grade 1 (0% grade 2).

Conclusions: Prostate BT is an effective and well tolerated re-irradiation treatment in local-recurrent prostate cancer patients, with, few long-term toxicities, mainly in HDR-BT patients.

SALVAGE HYPOFRACTIONATED VMAT FOR BIOCHEMICAL PROSTATE CANCER RELAPSE. LATE TOXICITY

Lazo, A.; López, E.; Arregui, G.; Rivas, D.; Gómez, J.; Serradilla, A.; Chaves, A.; Sacchetti, A.

Introduction and objective: In last few years, hypofractionated schemes have been shown to be equivalent, in effectiveness and toxicity, to conventional fractionation, in prostate cancer, thanks to new technologies. We want to communicate technical and clinical results, emphasizing in late toxicity, in a series of patients with relapsed prostate cancer treated with volume modulated arc therapy (VMAT) and hypofractionation.

Material and methods: We have studied patients with biochemical relapse between 2010 and 2014. All have been treated technique by intensity modulated radiotherapy (IMRT) VMAT type, image guided(IGRT) by cone beam system. The salvage prescription dose was 60 Gy (3 Gy/fraction-BED> 120 Gy); administered at 20 daily sessions. Treatment volume included the

surgical bed following the guidelines RTOG contouring. We comunicate the late toxicity.

Results: Twenty nine patients with a median age of 65 years (48-73). Although the aim of this study did not focus on the effectiveness of treatment, it is noteworthy that the mean PSA is 0.20 ng/ml (0,00 to 1,12 ng/ml) with a median follow-up of months (6-45). And despite of the hypofractionation, it was not observed any case of grade III-IV toxicity. Twenty two patients (91.6%) have no genito-urinary symptoms. Only two patients (7.7%) have late gastrointestinal toxicity (grade I). Mean time per session was 5'07" (3'15-7'25").

Conclusions: Radiotherapy is the standard nonsurgical salvage treatment for prostate cancer. Dose escalation and hypofractionation, with modern techniques, may improve the control of the disease with low late toxicity.

SBRT WITH VMAT-FFF BEAMS IN LOW OR INTERMEDIATE PCA

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Purpose and objective(s): To evaluate the feasibility and toxicity of hypofractionated SBRT with VMAT and flattening filter-free (FFF) beams.

Materials and methods: A prospective phase I-II study was approved by institutional review and ethics board. Inclusion criteria were prostate adenocarcinoma, Gleason Score 6-7, clinical stage T1b-T2b, PSA ≤20 ng/ml, prostate volume ≤60 cc, no previous surgery, and IPSS 0-7. IGRT with CBCT (with or without fiducial markers) was mandatory. Urinary catheter was needed in order to maintain bladder volume stable during treatment. SBRT was delivered at a prescribed planning target volume (PTV) dose of 35 Gy in five fractions in 5 alternative days using the TrueBeam with RapidArc VMAT, with 6 MV FFF photons. CTCAE v3.0 morbidity scores were used to assess toxicities.

Results: Eleven patients have been recruited. Mean age was 71.2 years. Pathology centralized Gleason score was 6 in 6 patients and 7 (3+4) in another 6 patients. Mean PSA was 9 ng/ml. According to D'Amico risk classification, 6/11 patients were low-risk and 5/11 were intermediate risk. Mean prostate volume was 38.3 cc. All patients completed the treatment as programmed with good tolerance. No toxicity greater than grade 2 was observed. Acute rectal and GU toxicities were seen in 4/11 (36.4%) and 3/11 (27.3%) patients respectively. Both rectal and GU late toxicities G 2 were: 1/11 (9.1%).

Conclusion: Early findings indicate that SBRT with VMAT and FFF beams for low–intermediate-risk prostate cancer delivered in five fractions is feasible and well tolerated in selected patients.

SECOND MALIGNANCIES AFTER IODINE-125 PROSTATE BRACHYTHERAPY AS MONOTHERAPY

Fernandez Ots, A.; Bucci, J.; Malouf, D.; Chin, Y.; Browne, L.

Purpose: To report incidence of second primary cancer (SPC) after Iodine-125 brachytherapy for prostate cancer in a single institution and compare it with the cancer incidence in the general population.

Patients and methods: This retrospective study included 906 patients. Data were collected on all subsequent SPC diagnoses. Interval since the implant was evaluated for potential radiation induced malignancy. Standardized incidence ratios (SIRs) were calculated.

Results: Patients were followed for a mean of 3.3 (0-11) years with 226 (25%) patients having 5 years or more follow up. 62% patients were >60 years. Of the total, 37 patients (4.1%) subsequently developed a SPC; 7 were bladder and 1 rectal cancer. The 5-year cumulative incidences were 6.8 (4.6-9.9) and 1.5 (0.7-3.7) for any second malignancy and bladder cancer, respectively. The SIR for all malignancies was 0.98 (95% CI, 0.7-1.4) and significantly higher for bladder cancer at 4.24 (95% CI, 1.7-87). In the subgroup analysis, Bladder SPC risk was higher than expected for ≤60 years (SIR 9.7; 95%CI 2.0-28.3; AER 23.9) and in the first 5 years of follow up (SIR 3.76; 95% CI 1.22-8.77; AER 14.5). Older age (HR 1.06, p=0.041) and smoking status (HR 2.81 p=0.017) were associated with increased SPC risk (p=0.032).

Conclusion: Overall, no increased tumor incidence was found compared with the general population. We observed a higher than expected incidence of bladder SPC after brachytherapy in the first 5 years of follow-up, probably resulting from screening bias. Because of power limitations, an increase SPC cannot be formally excluded.

SET-UP UNCERTAINTIES CORRECTION IN PROSTATE CANCER PATIENTS (PCP) TREATED WITH IMRT

Pardo Masferrer, J.; González González, J.; Montemuiño Muñiz, S.; Sintes Garriga, M.; Alastuey González, I.; Guerrero Grande, A.; Bodi Blanes, L.; Font Gelabert, J.; Ortiz González, I.; Jiménez Jiménez, E.

Purpose: To compare two methods to calculate the margins for expansion from CTV to PTV in PCP.

Materials and methods: 40 consecutive PCP treated with IMRT were included. CBCT was performed the first 4 treatment days. The average of the displacements regarding the reference image was determined and checked by another CBCT in the fifth day. Weekly follow- up-CBCT was performed. For each patient, deviations values were obtained in the three directions and the average value and SD of these errors were calculated. Regarding random errors, the first 5 CBCT errors were corrected by subtracting the systematic errors mean value. With the "corrected" errors and the other errors measured during follow-up-CBCT, SD was determined. Each individual overall deviation was squared, added all squares and obtained the SD of random errors (σ).Formulas of van Herk and Stroom were applied for each direction.

Results: Systematic errors mean values (cm) of the first 5CBCT were:ver: 0,3, long: 0,2 y at: 0,2. The SD of the random errors was: σver: 0.3, σlong: 0.2y σlat: 0.2. The results of applying van Herk and Stroom formulas..

Conclusions: No significant differences were obtained with the two formulas. Margin obtained by Stroom´s ensures that 99% of CTV is within the 95% isodose, and the obtained by van Herk's ensures that 90% of the population receives at least 95% of the prescribed dose to CTV. We have decided to apply the van Herk formula because has less impact on OAR.

SIB-IMRT IN HIGH RISK PROSTATE ADENOCARCINOMA: INSTITUTIONAL EXPERIENCE

Fondevilla, A.; Sautbayev, A.; Dzhugashvili, M.; Platoshkin, V.; Sempere, P.; Castañeda, P.; Díaz, J.M.; Azinovic, I.

Purpose: To evaluate survival and toxicity results of Intensity Modulated Radiation Therapy with Simultaneously Integrated Boost (SIB-IMRT) for high risk prostate cancer patients.

Materials and methods: One hundred sixty-six patients with high risk prostate cancer (according to NCCN criteria) were treated between July 2008 and December 2012. Median age -68 years, T≥T2c disease stage was observed in 48% of patients, Gleason score was ≥8 in 60%; more than 55% of patients had PSA levels

above 10 ng/ml. "Step and shoot" IMRT technique with SIB was applied. A total dose of 54.12 Gy was delivered to lymph node chains, 59.40 Gy –to seminal vesicles and 74.25-75.90 Gy– to prostate in 33 daily fractions. Toxicity was scored using RTOG criteria.

Results: Dosimetric analysis: 79% of patients had rectal V70 less than 10%. Mean maximum rectal dose was 76.9 Gy (72-82 Gy). Small bowel V30 was less than 40% in 56% cases. Bladder V60 was less than 40% in 89% of patients. Toxicity: Acute proctitis GI-II was observed in 20% of cases, acute enteritis G0-G1– in 95%. Chronic cystitis GI was observed in 14% of patients, 2 patients suffered from proctitis GIII. Only 5% of patients (8 patients) developed biochemical recurrence during 5-year follow-up (median=24 months). Three patients (2%) developed distant metastases.

Conclusion: SIB-IMRT technique is a well tolerated regimen and is characterized by low acute and chronic toxicity (enteritis and proctitis). Longer follow-up period is needed to assess locoregional and biochemical control rates as late effects.

SINGLE-CENTRE RANDOMIZED TRIAL OF MULTI-FIELD 3D-CRT IN PROSTATE CANCER

Rodríguez Melcón, J.I.; Soria Carreras, P.; Martín Rincón, C.; Blanco Villar, M.; Henríquez Hernández, L.A.; Blanco Suárez, J.M.; García Cabrera, L.

Aim: In 2004 a prospective randomized trial was prompted to determine whether a 3D-CRT multi-field arrangement can improve dosimetric parameters and toxicity over standard 4-field-box, in the treatment of prostate cancer (PCa). Design and early results were previously reported in FESEO 2004. Long-term results are now presented.

Methods: Between February'04 and September'05, 120 PCa patients were randomized 1:1 to 70 Gy 3D-CRT with 7-fields (7F) or 4-fields (4F). CT simulation was conducted without bladder/rectal filling control or immobilization devices. All VOIs were contoured by a single radiation-oncologist. PTV included prostate ± seminal vesicles (according to Roach formula) with 1 cm margin (0.6 cm posterior). The constraints used for OARs were based on those published by Emami. Set-up control was performed with EPID. For toxicity assessment RTOG/EORTC scales were used.

Results: 117 patients were available for analysis (7F n=57, 4F n=60). No significant differences between groups in clinical or pathological features were detected. For non-different PTV volumes, 7F performed better in the low-dose (≤45 Gy) part of DVH, while 4F was better in the high-dose (rectal V70 compliance 89.5% vs. 98.3%, p=0.049). No significant differences in acute toxicity were found. Only skin toxicity was lower in 7F arm when analyzed as 0-1 vs. ≥2 (p=0.003). After a median follow-up of 7.8 years, rates of late GU and GI toxicity ≥2 were identical in both groups (5.1% and 1.8%, respectively).

Conclusions: None of the field-arrangement was clearly superior to the other and the small differences detected were clinically irrelevant.

STUDY OF HYPOFRACTIONATION MODERATE SCHEME IN LOCALIZED PROSTATE CANCER

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Objetives and purpose: In our study we have evaluated dose - volume histograms (DVH) of rectum and bladder once processed to equivalent biological dose for different fractionation schedules. This analysis is done through dose-volume parameters recommended in QUANTEC.

Material and methods: We have analyzed DVH transformed to 2 Gy equivalent dose (ED2 Gy) for rectum and bladder in twenty patients with low risk prostate adenocarcinoma according to NCCN classification. We have used a moderate hypofractionation (2.5 Gy/session) with a total dose of 70 Gy (ED2 Gy=80 Gy; α/ß=1.5 Gy) and conventional fractionation (2 Gy/session) with a total dose of 74 Gy.

Results: We have noted that the values obtained in case of bladder are lower than QUANTEC recommendations in all patients and for both fractionation schemes. The values obtained in case of rectum are lower than QUANTEC recommendations except for two patients, although this circumstance occurs in the hypofractionated and standard schemes.

Conclusions: The radiobiological study for localized prostate cancer with moderate hypofractionated scheme (70 Gy/2.5 Gy session) compared to the standard scheme (74 Gy/2 Gy session), shows that an increase of biological equivalent dose in tumor would be achieved by keeping the levels of late toxicity in rectum and bladder.

SUCCESSFUL RESULTS OF HYPOFRACTIONATED RAPIDARC IGRT IN PROSTATE CANCER

Salinas Ramos, J.; Iglesias Agüera, A.: Gómez Aparicio, MA.:, Escolar Pérez, P.P.

Introduction: In 2011 we started up a prospective protocol for external radiotherapy in localized prostate cancer. Staging workup included DRE, PSA, Gleason score, total-body CT, bone scan and prostate MRI. Radiotherapy scheme were 70 Gy in 28Fx. Technique RapidArc with SIB. Volume: low risk: prostate only; high risk: prostate and pelvis; intermediate risk: prostate + pelvis according roach formula. IGRT was performed with daily CBCT. Intermediate and high risk patients had short and long hormonal therapy respectively.

Methods: We analyzed a consecutive non-selected series of patients treated until 2013 Feb. Total number were 115 patients. Characteristics: mean Age 70.1 (range: 52-82); mean PSA 15 (range 1.7-85). T distribution: T1 71, T2 38, T3-4 6. MRI showed extracapsular extension in 39 patients. Gleason score: G5 2, G6 37, G7 41, G8 25, G9 8, G10 2. Risk groups: low risk 25; intermediate risk 32; high risk 58. Median follow up 32 months.

Results: 3yr results. Mean final PSA: 0.17 (0-1.19), median PSA: 0,09. Cause specific survival 100%. Biochemical Relapse Free Survival 100%; Local, Regional and Metastasis Free Survival 100%. Crude Survival 96.5%. Toxicity: Genitourinary G0 62, G1 40, G2 11 (9.5%), G3 2 (1.7%). Gastrointestinal G0: 92; G1: 19; G2 4 (3.4%); G3 1 (0.8%).

Conclusion: In our experience IGRT-RapidArc for localized prostate cancer showed an excellent short term results. We need a longer follow-up to confirm biochemical and local control and assess toxicity.

SURVIVAL AFTER BIOCHEMICAL FAILURE IN PROSTATE CANCER: RECAP DATABASE OUTCOMES

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Objectives: Patient's evolution after biochemical failure (BF) is a poor studied parameter. We analyze survival from recurrence, patterns of progression and efficacy of salvage therapies in patients treated with radical or postoperative radiotherapy.

Material and methods: Multicenter retrospective comparative study of 1.141 pts with BF, treated with radical (909 pts) or postoperative (232 pts) radiotherapy. Data were acquired from the

RECAP database (August 1993-December 2013). Clinical, tumoral and therapeutic characteristics were collected. Descriptive statistics, survival estimates determined by Kaplan-Meier and comparisons of survival rates were performed using log-rank test.

Results: Mean time to BF from initial diagnosis was higher in irradiated patients (54.6 vs 36.1 months). With a median follow-up of 101 months [99-105], the 5-years cause-specific survival was 86.5% without significant differences between groups. Only 162 patients (14%) died of prostate cancer and 31 (2.7%) of second cancer. 16% who underwent prostatectomy and 15% of irradiated patients did not receive treatment after BF. Only 41 patients (4.5%) who underwent radical RT had local salvage treatment (cryotherapy, HIFU or brachytherapy) and 71% received androgen deprivation ± chemotherapy. The poorest outcomes were observed in patients who developed BF after adjuvant RT, in patients with persistent elevated PSA after prostatectomy and in cases with high Gleason score.

Conclusions: In prostate cancer patients, median survival after BF is fairly long. There is no difference in survival in both groups at 5-years. Androgen deprivation is the most common treatment after BF.

TESTOSTERONE LEVEL IN PROSTATE CANCER PATIENTS TREATED WITH RADICAL TREATMENT

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Objective: To evaluate the influence of testosterone level on biochemical disease-free survival (BDFS), disease free survival (DFS), cancer specific survival (CSS) and overall survival (OS) in patients treated with radiotherapy and androgen deprivation therapy (ADT).

Materials and methods: Retrospective comparative study of 317 (pts) treated from October 2001 to June 2010 with low testosterone levels (LTL=128) and normal levels (NTL=189) after treatment. LTL pts were older and had higher PSA level, primary tumor stage, risk group, Gleason score and positive cylinder percentage. Median total radiotherapy dose was 76 Gy (60-78). Phoenix definition was used for biochemical failure; Kaplan-Meier curves and log-rank test were used to compare survivals. Prognostic factors like age, primary tumor stage, Gleason and ADT were related to BDFS, DFS, OS and CSS using Cox regression.

Results: Median follow-up was 78 months for NTL and 72 months for LTL. The 10-years BDFS, DFS, OS and CSS in NTL were 87%, 85%, 97% and 100% respectively and in LTL were 85% (p=0.066), 85% (p=0.083), 56% (p=0.0001) and 98% (p=0.068). In the multivariant analysis, ADT>24 months was significant predictor for BDFS and DFS, and age for OS. In both groups, the majority of pts had acute and late genitourinary and gastrointestinal toxicity grade 1-2.

Conclusion: In spite of pts with LTL had more advanced and aggressive disease at baseline the results of BDFS, DFS and CSS didn´t show significant differences compared with pts that had NTL. The lower OS was due to deaths because of second cancers and age.

USE OF ABIRATERONE IN METASTASIC PROSTATE CANCER WITHOUT PREVIOUS CHEMOTHERAPY

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Background: We present the experience of the Radiotherapy Department in the use of abiraterone in metastasic prostate cancer previous chemotherapy based on the results of COU-AA-302 study.

Methods: Descriptive analysis of 10 patients treated with Abiraterone after progression to hormonal and radiotherapy treatment, being asymptomatic or mildly symptomatic, treated between December 2012 and December 2014. The mean age was 68, all with ECOG 0-1. No case had visceral disease. All patients had a Gleason score ≥8 and they fulfilled criteria castration resistance.

Results: With a median follow-up from diagnosis of metastatic disease 25 months, 90% of patients are still alive. In 5 cases, PSA declines of greater than 50% with stable or radiological partial response was obtained; in 3 cases decreased the PSA less than 50%, with stabilization of bone disease in 2 cases and progression in one of them; and in two cases, the PSA continued to rise, although only one of them is documented progression of metastatic disease today. Among responders, there is a complete response maintained after 22 months of treatment. In terms of tolerance, there is no discontinuation due to poor tolerance or serious toxicity.

Conclusions: In terms of survival, the results of cohort require a greater number of events or progression for the correct statistical analysis. Treatment with abiraterone in chemotherapy-naïve patients is an option with excellent tolerance and low toxicity. It will be necessary to extend monitoring and the number of patients to see if our cohort reproduces the results of the COU-AA-302 trial.

USE OF POPULATION BASED DVH REFERENCE FOR VMAT TREATMENT PLAN EVALUATION FOR PROSTATE CANCER

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Introduction and objective: To generate population based DVH and use it for treatment plan evaluation in VMAT prostate.

Materials and methods: Prostate patients are treated with a single arc VMAT technique using a moderate hypofractionation (3 Gy/fraction to 60 Gy in 20 fractions). DVH and technical parameters are exported from treatment planning systems to a centralized database established in 2005. Retrospective DVH analysis is performed using an in-house software that allows for relevant statistics for organ at risks and target volumes. Population based DVHs are generated for critical organ at risks. Actual patient is compared with reference population DVHs allowing for fast identification of clinical dosimetry problems or outliers. Using database DVH a comparison of 3D RT and VMAT RT is done using NTCP as quality criteria.

Results: Using representative patients of the database three population based DVH (mean DVH, 10% percentile DVH and 90% percentile DVH are generated for rectum, bladder and femoral heads. Actual patient DVH is exported from TPS to an in-house software that compare actual DVH with population DVH and population clinical parameters. Comparison of rectum NTCP versus plan date shows the difference between 3DRT and VMAT and learning curve.

Conclusions: There is a need for centralized database of dosimetry parameters that allows to compare actual treatment with historical treatments. We made a software application that allows for such comparison and provide valuable help identifying complicate or outlier treatments and providing more information for optimizing process.

WHOLE-PELVIS RADIOTHERAPY WITH HYPOFRACTIONATED SIMULTANEOUS-INTEGRATED BOOST FOR HIGH-RISK PROSTATE CANCER

Rodríguez Melcón, J.I.; Henríquez Hernández, L.A.; Pérez Molina, J.L.; García Cabrera, L.; Blanco Suárez, J.M.; Marbán Orejas, M.C.; González Machín, G.; Jiménez, C.; Artiles, J.L.; Lara, P.C.

Aim: Elective pelvic irradiation (WPRT) in prostate cancer (PCa) is under debate. High-risk patients may benefit from both WPRT and dose-escalation to the prostate. We present initial results of a WPRT + hypofractionated simultaneous-integrated boost (hSIB) prospective protocol for high-risk PCa.

Methods: An iso-toxic scheme to the previous of our institution (74 Gy, 2 Gy/fraction) was designed. CTV1: pelvic nodes, seminal vesicles and prostate, 46 Gy, 23×2.0 Gy; CTV2 (hSIB): prostate + 1 cm seminal vesicles, 64.4 Gy 23×2.8 Gy (NTD2: 79.1 Gy, α/ß: 1.5). QUANTEC constraints were converted for plan approval (α/ß: 3 for rectum, 10 for bladder). 3D-CRT/VMAT and NAL-protocol for set-up control were used. Neoadjuvant and long-adjuvant androgen deprivation was indicated. Phoenix definition and a simplified CTCAE 4.0 scale were used for assessment.

Results: Between June'11 and June'13, 35 high-risk patients (≥T3a, GS≥8, PSA>20 ng/ml) were treated. Median age was 68 years. 11.4% of patients required VMAT after 3D-CRT failed to achieve constraints. Acute GU, GI, rectal and anal toxicities grade 2 were 45.7%, 31.4%, 54.3% and 14.3%, respectively (no grade 3-4). Median OTT was 34 days. After a median follow-up of 15 months 3 patients relapsed (one died from PCa). Actuarial 3y-BFFS, MFS and CFFS were 92.6%, 93.2% and 85.4%, respectively. Late grade 2 toxicities were 10%, 0%, 9.7% and 0%, respectively (rectal grade 3 toxicity 3.2%).

Conclusions: This protocol allows WPRT with a simultaneous 79 Gy-equivalent dose to the prostate in 4.5 weeks. Patients needed more medical interventions during and up 6-months after treatment, without an increase in late toxicity. These outcomes require further follow-up.

YOUNG SESSION

ACCURACY OF RESTAGIN MRI AFTER PREOPERATIVE CHEMORADIOTHERAPY IN RECTAL CANCER

Büchser García, D.; Martín Martín, M.; Fernández Banda, L.; Marín Palomo, A.; Alvarenga, F.V.; Cerezo Padellano, L.

Purpose: The role of Magnetic Resonance Imaging (MRI) in restagin rectal cancer after preoperative chemoradiotherapy (CRT) is under discussion and its accuracy in this particular scenario remains unclear. We evaluated the accuracy of magnetic resonance imaging after neoadyuvant chemoradiotherapy in our centre in patients with rectal cancer.

Methods and materials: We analized retrospectively 50 patients with rectal cancer who received neoadyuvant CRT, from March 2007 to June 2014. Only patients who received long course CRT and underwent restagin MRI followed by total mesorectal excision (low anterior resection or abdominoperineal resection) were included. The primary endpoint was to estimate the accuracy of restaging MRI as compare with pathologic staging. To do so, we calculated Cohen Kappa coefficient and specificity and Sensitivity of restaging MRI.

Results: After pathologic assessment, 76% of patients experienced downstaging. Regarding T staging, post-CRT MRI classified correctly 68% patients (34), understaged 18% (9) and overstaged 14% (7), the concordance degree was 0.5 (moderate). Regarding N staging, post-CRT MRI agreed in 52% patients (36) with the pathologic analysis, 18% (9) were understaged and 30% (15) were overstaged achieving a concordance degree of 0.21 (fair).

Conclusions: Post-CRT MRI shows a moderate accuracy in local restaging after neoadyunavt therapy, whereas concordance in nodal involvement was just fair. Further and more solid studies are nedeed before we can rely on post-CRT MRI to select patients who could be managed using less agressive interventions (transanal resection).

BCRA1 OVEREXPRESSION AS PREDICTOR OF RADIORESISTANCE IN LUNG CANCER

Fernandez Banda, L.; Büchser, D.; Alvarenga, F.V.; Obispo, B.; Prada, J.; Bashir, S.; Marin, A.; Cerezo, L.; Martin Martin, M.

Objective: BCRA1 is a gene which plays a crucial role in DNA repair pathways. Its expression has been related to chemo-radiotherapy resistance. The determination of BCRA1 expression in patients who have undergone lung surgery, could help to individualize chemotherapy treatment and to adjust the dose of radiation among them. The objective is to determine if BCRA1 expression in those patients included in the SCAT trial have greater overall and disease-free survival rates than those without BCRA1 expression, and to determine their recurrence pattern.

Material and methods: 41 patients with operated Non-Small Cell Lung Cancer were treated from 1st August 2007 to 31st March 2014. We analyzed the RNAm of BCRA1 genes from patients included in the SCAT trial.

Results: The BCRA1 expression was determined in 39% of the patients: 18% had low expression, 56% intermediate expression and 25% high expression. With a median follow-up of 24 months, the disease-free and overall survival in those patients with BCRA1 expression was 56% and 73% respectively vs 40.5% and 33% in those without BCRA1 determination. In patients with high/intermediate expression there were 25% of local recurrences vs 0% in low expression and 62.5% of systemic recurrence vs 50%.

Conclusion: The determination of BCRA1 helps to individualize chemotherapy treatment achieving greater survival rates. We have not found statistical significance probably due to the small number of patients. We have observed a greater local recurrence rate in patients with high/intermediate expression, which may imply the necessity of adjusting the radiation dose in these patients.

COMPARISON OF TWO SCHEMES BRACHYTHERAPY IN PROSTATE CANCER

Laria Font, C.; Paredes Rubio, S.; Castaño Zuleta, F.A.; Velilla Millán, C.; Bascón Santaló, N.; Bellosta Ferrer, R.; Blasco, B.; Pérez Arbej, J.A.

Prostate cancer is the most common solid tumor and it ranks as the second most prevalent cancer mortality in men. Over 95% of cases present with localized disease. The treatment of prostate cancer has evolved significantly in recent years, performing surgical techniques less invasive and use of radiotherapy techniques and more precise brachytherapy, have increased local control rates and decrease morbidity. In this study we compare the short term adverse effects present with the use of two different doses of brachytherapy. We have analyzed a total of 51 patients with prostate cancer, 27.5% had an intermediate risk, 56.9% high risk and 15.7% very high risk. 90.2% were with combined androgen blockade. All patients received external irradiation on prostate and vesicles and 56% also on the pelvis Using CT based treat-

ment planning. 47.2% of the sample received 9.5 Gy boost with brachytherapy and 52.1% received 13 Gy. In patients in which boost of 9.5 Gy was given: They were implanted an average of 15 needles. 6 cases of acute adverse effects were observed, all urological characteristics. With a median follow-up 3 months 4 patients with urological disorders and 3 digestive became evident. In patients in which boost of 13 Gy was given: an average of 15 needles were implanted. Only one case of acute urological abnormalities were observed. After a median of three months there was only one case in each of urological and gastrointestinal adverse effects. In view of these results, we have recently increased the boost prostate brachytherapy about 15 Gy.

FEASIBILITY OF HDR BRACHYTHERAPY IN ONE FRACTION FOR APBI

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Objetive: To show how we apply accelerated partial breast irradiation with rigid interstitial implant brachytherapy in a single 18 Gy fraction after conserving-surgery with skin sparing and in vivo dosimetry. APBI allows deliver adjuvant radiation therapy after conserving-surgery (CS) in one week or less. There are several techniques tested such as external beam radiotherapy, intraoperative radiotherapy or brachytherapy. Intersticial brachytherapy has been employed the longest and has the most extensive follow-up.

Material and method: To perform the implant is necessary to have an adequate infrastructure and to have a radio-operating room which allows maintaining aseptic conditions and an adequate insulation. The material used will be: Metal Catheters. Different sizes of racks. Hyaluronic Acid. MOSFET dosimetry. The day of the intervention, after local anesthesia of the patient and preparation of the surgical field, we insert catheters guided by ultrasound or fluoroscopy. Hyaluronic acid will be used if necessary to separate dose limiting structures. Finally, we make a TAC for planning the treatment and we place the MOSFET dosimeters at dose limiting structures and subsequent to administration of the treatment. The dose administrated is 18 Gy, we use constrains recommended by the American Brachytherapy Society.

Results: From January 2013 to January 2015 we have treated three patients in this way. One patient had epidermitis g2 as acute toxicity. None of them have recurrence in this moment.

Conclusions: APBI with metal catheters in one fraction with 18 Gy is a feasible technique with low acute toxicity using subepidermic hialuronic acid and with dose control with Mosfets dosimetry.

SENESCENCE CELLULAR MARKERS IN RECTAL CANCER AFTER NEOADJUVANT RADIOCHEMOTHERAPY

Rivero, M.; Carnero, A.; Ortiz, M.J.; Pachón, J.; Rincón, I.; Fernández, M.C.; Silva-García, A.

Objectives: The golden goal of anticancer therapies is the induction of specific tumor cell death. Tumors are considered chemo/radioresistant when we cannot obtain this response, but other mechanisms can stop tumoral proliferation. Cellular senescence is a terminal cell division arrest induced by different stimuli, including ionizing radiation and chemotherapeutic drugs. The aim of this study was to identify the induction of senescence in locally advanced rectal tumors after neoadjuvant radio-chemotherapy, and its correlation with patients survival.

Material and methods: We constructed tissue microarrays from the biopsy paraffined samples of 44 patients with rectal carcinoma treated with neoadjuvant radio-chemotherapy. We made histological sections and evaluated them immunohistochemically to identify p21waf1 and Ki67.

Results: Low expression of Ki67 associated high levels of p21waf1, and high Ki67 associated low p21waf1 (p10, and obtained the same inverse association with Ki67 (p10, and we registered it in 11% of patients (p>0.002) who showed higher disease free-survival (p<0.063) and overall survival (p<0.242).

Conclusions: Senescence cellular is a tumor suppressor mechanism induced by radiochemotherapy. Identification of senescence biomarkers could be an effective tool interfering in clinical strategies.

BRACHITHERAPY

MICCIONAL DYNAMICS IMPACT AFTER I-125 PROSTATE BRACHYTHERAPY: UNDERLYING FACTORS

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Purpose: To evaluate the main factors that have influence in the presentation of acute urinary retention (AUR) in patient who have been submitted to I-125 prostate brachytherapy.

Materials and methods: Between March 2011 and December 2013 we have carried out 66 prostate brachytherapy in patients with prostate cancer of low and intermediate risk. In 4 patients we carried out external radiotherapy in addition. 14 patients received previous hormonotherapy. The doses used was 145 Gy in exclusive brachytherapy and 108 Gy in combined external radiotherapy. Of 66 patients treated, 5 didn´t have initial IPSS, 13 didn´t have complete follow up, and 48 remaining have a suitable follow up. The variables that have been evaluated were: Prostate volume, Qmax, Number of seeds, Number of needles and Urethra´s D1; p value was obtained for Mann-Whitney test. The average of prostate volume was 33.73 cc, Qmax: 18.7 ml/sec, number of seeds: 60.2, number of needles: 16.1 and Urethra`s D1: 138% the prescribed dose.

Results: With an average follow up to 27 months, 3 patients presented AUR, in the first month after the implant. Only prostate volume had "p" closer statistically significant (p: 0.0583). IPSS and Qmax showed a tendency, without p statistically significant. In this patients average of prostate volume was 42.47cc, Qmax: 7.63 and IPSS: 9.33, worse than non AUR

Conclusions: Incident of AUR in patients submitted to prostate brachytherapy is low (4.5%), existing a relation with prostate volume, and a tendency with Qmax and IPSS at diagnosis

7 YEARS OF FOLLOW. HIGH DOSE RATE BRACHYTHERAPY IN MONOTHERAPY IN PATIENTS WITH PROSTATE CANCER AT LOW RISK. EXPERIENCE CENTRAL UNIVERSITY HOSPITAL OF ASTURIAS

Orduz Arenas, A.C.; Jimenez, García, I.E.; Gonzalez Suarez, H.

The High-dose-rate brachytherapy as monotherapy, is a treatment option in patients with low-risk prostate cancer and can be used as an alternative to the Low-dose-rate brachytherapy. Compared to the Low-dose-rate, the HDR single dose has not proven long-term results with regard to disease control. Also unknown the dose of treatment should be used to reduce unaffordable toxic effects. Results of the Hospital Universitario Central de As-

turias (HUCA) on patients treated with High-Dose-Rate Brachytherapy as monotherapy are presented below.

Materials and methods: Sample: A series of 75 patients in the HUCA between 2008 and 2013 treated with High-Dose-Rate Brachytherapy (HDR) single dose of 19 Gy and 20.5 Gy were selected. A technique of guided-ultrasound brachytherapy and dynamic-calculated intraoperative dose was used.

Results: The results show an overall survival of 91.3% of patients, with disease-free survival of 97% of patients and a biochemical disease control of 72.5%. Patients toxicity: Acute urinary toxicity: 53.8% (Grade 2). Chronic urinary toxicity: 49.2% (Grade 2). Acute gastrointestinal toxicity: 86.2% (Grade 1). Chronic gastrointestinal toxicity: 89% (Grade 1). Acute urinary retention rate of 2.9%.

Conclusions: Given these results, the biochemical control of HDR monotherapy is low and therefore not an appropriate treatment for patients with low-risk prostate cancer.

A NEW INTRACAVITARY/INTERSTITIAL TEMPLETE COMPATIBLE WITH MRI GEC-ESTRO RECOMMENDATIONS

Rodriguez Villalba, S.; Richart Sancho, J.; Otal Palacin, A.; Depiaggio, M.; Perez Calatayud, J.; Ballester, F.; Santos Ortega, M.

Purpose: To present a novel MRI compatible perineal template, able to support: an intrauterine probe (Intracavitary component. IC) and Titanium needles (TN. Interstitial component) for 4D MRI-Guided brachytherapy (BT) applications in locally advanced gynaecological cancer (LAGC).

Materials and methods: From January 2006 to November 2013, 65 interstitial treatments employing Martinez Universal Perineal Interstitial template (MUPIT) have been done at our Institution for LAGC as a radical treatment. MUPIT has well known advantages: possibility of treat medial and distal parametrium (avoiding the dosimetric sum with external radiotherapy), medial and distal vaginal and tumoral affectation of rectal and bladder wall. But it has some limitations too: impossibility to add the IC limiting the BT-CTV in cranial direction and the need to use CT for the dosimetry due in part to the artefact produced by the stainless steel needles. From 2006 we began to employ MRI following the GEC-ESTRO recommendations in BT procedures mainly in early stages of cervix carcinoma and in 2009 we incorporate Utrecht applicator for these patients.

Results: Looking for unification of the gynaecological interstitial and IC BT technical advantages we have developed a Templete. This have several holes rows to introduce straight and angled TN to allow coverage of DP and the totality of the vagina. It has also the possibility to include a intrauterine probe and vaginal cylinders of several sizes with 8 positions of needles in its surface.

Conclusions: We present the technical description of a new template MR-compatible, allowing improvement on target contouring and CTV conformation.

ADYUVANT VAGINAL BRACHYTHERAPY WITHOUT EXTERNAL BEAM RADIOTHERAPY FOR ENDOMETRIAL CANCER

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Purpose: The aim is to report the results obtained in patients diagnosed of endometrial carcinoma stage IA-IIA treated with surgery followed adyuvant brachytherapy at our institution.

Materials: From 2006 until 2013, 116 patients with endometrial carcinoma stage IA-IIA have been treated with surgery and exclusive vaginal brachytherapy. Median age of the series was 62 years. Total hysterectomy, double anexectomy, pelvic lymphadenectomy and peritoneal washing was made in 61.4%. The majority of the pathologycal FIGO stages were IB (77.2%). Exclusive brachytherapy was performed using vaginal cylinders with 3 cm of diameter (50.9%). The reference isodosis covering the proximal 3 cm of the vagina (96.4%). The dose was specified at 5 mm distant from the surface of the cylinder. Dose schedule with high dose rate brachytherapy was 21 Gy in 3 fractions. The median of dose equivalent received in the rectum was 31.8 Gy and in bladder 38 Gy.

Results: At the moment of this analysis there are 4 relapses: 2 of them live with disease, and 2 death for tumor; 110 cases live without disease (94.82%), and 2 cases death for another cause. Withmedian follow-up of 26 months, free disease survival was 90.2% and 2 years overall survival was 88.3%. No toxicity was reported in the 52.6%, and when it was present the most frequent was cystitis (12.3%).

Conclusions: The exclusive vaginal brachytherapy is effective in ensuring vaginal control, with few toxic effects. So, this schedule should be an adyuvant treatment for these patients.

BRACHYTHERAPY IN THE CONTEXT OF ELDERLY PATIENTS

Pérez Echagüen, S.; Ossola Lentati, G.A.; Sanz Freire, C.J.

Objective: Elderly cancer patients in situation of independence for carrying out Basic Activities of Daily Living (BADL), without comorbidity and life expectancy above one year are being referred to Radiation Oncology Departments more frequently. These patients over 85 with local or locally-advanced esophageal, ano-rectal, skin or head-and-neck tumors for which surgical management is excluded, symptomatic radiation treatment is indicated Quality-of-life (QOL) for these patients is affected by tumor local growth. Because of their advanced age, the surgical, chemo or radiation therapy treatment associated morbidity, and upon cost-benefit considerations, palliative-cytoreductive radiotherapy is indicated. These treatments are short EBRT regimens such as 20 Gy in 5 fx or 30 Gy in 10 fx for symptomatic local control. Endorsed by our extensive expertise, we decided to consider Brachytherapy as an alternative treatment for these patients.

Material and methods: We report on our experience in BT in the context of elderly patients. Comparative analysis of tumor response, progression-free survival, toxicity and cost-benefit of BT vs. short-scheme EBRT is carried out. An extensive number of locations and settings are considered: esophageal endoluminal BT, anal-canal endoluminal BT, custom-made skin molds, oral-cavity intracavitary BT.

Results: Brachytherapy was indicated as elective treatment for elderly patients who meet the above described requirements over the last 7 years in our Institution. Comparable results of local control to palliative EBRT were obtained. Better results of toxicity and tolerance to treatment were achieved. Social-family benefits and QOL improvement were reached.

Conclusions: Brachytherapy is considered as an excellent treatment option in the context of symptomatic management of tumor local growth in elderly patients.

BRACHYTHERAPY WITH IODINE 125 FOR PROSTATE CANCER, PRELIMINARY RESULTS AND COMPLICATIONS

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Introduction: Prostatic brachytherapy is a therapeutic option in the treatment of organ confined prostate cancer with free biochemical failure survival 87%-90% in 5-10 year follow-up in the published series. We review the experience with prostate carcinoma patients treated with permanent implants of ^{125}–I seeds. We analyse preliminary results and complications after tree years.

Methods: From September 2011 to December 2014 we have performed 118 implants with brachytherapy with BARD PROLINK system. We include low-risk patients (T1-T2a and Gleason 10 and ≤20 ng) and selected cases of intermediate risk (T2b, or Gleason=7 or PSA>10 and ≤20 ng). Mean follow-up is 21 months (1-48), we excluded patients with less than 12 months of follow-up for statistical analysis. Biochemical failure was defined in accordance to the ASTRO criteria. Urinary and gastrointestinal complications were evaluated in accordance to the RTOG criteria.

Results: Mean age was 67 (48-81). T1C was the stage in 93%, T2a 5% and 2% T2b. 90% with PSA<10 and Gleason ≤6 in 94% cases. Hormonal treatment was used in 14 patients (12%). We included 3 patients with previous RTU. 98% of patients had a prostatic volume <60 cc. We obtained mean IPSS 6 (0-19) before brachytherapy and 14 IIEF-6 (0-35). Urinary complications were G1: 39%, G2: 11% average duration of one year. One patient has required RTU in the first year. An urinary catheter was necessary in 3 patients. Gastrointestinal complications were G1: 1%-4% in the first 6 months, tending to limit themselves to the loss of activity of the implant. The IPSS and IIEF-6 showed an aggravation to 10 and 4.9 points respectively in the first month, with a recovery time of 12 months. PSA progressively decreased and PSA levels were <1 ng/ml after 12 months. We have not objectified booster effect. Overall 3 years survival was 100%.

Conclusions: The outcome of patients with low risk prostate carcinoma treated with I-^{125} is very good with were low rate complications, howere our folllow -up serie is short.

BT VERSUS EBRT IN PALLIATIVE MANAGEMENT OF SKIN LESIONS. A CASE REPORT

Pérez Echagüen, S.; Ossola Lentati, G.A.; Sanz Freire, C.J.

Objective: Elderly non-melanoma skin cancer patients with comorbidity but life expectative over one year are referred to RO Departments by dermatologists or surgeons more frequently. For this highly-evolved skin cancer patients where surgery is discarded due to associated morbidity, no-invasive RT is indicated. Two options are considered: palliative BT vs. palliative short-course EBRT. This work reports on the evolution of a case of skin lesion approached through non-invasive BT.

Material and methods: We started to work with custom-made skin molds in the context of elderly patients in 2013 with similar results to EBRT of tumor response and better results of toxicity and tolerance to treatment. The case here considered is a 96 year-old patient with highly evolved non-melanoma skin cancer who was refereed to our Department. Due to patient characteristics, both invasive interstitial BT or immobilization for a complete course of EBRT was simply unthinkable. We decided to go for a contact BT with custom-made mold with plastic catheters embedded. Prescribed dose was 74 Gy EQD2 in 10fx. Patient with mold in position was 3D-simulated and contoured. Dose calculation was volume-optimized. Normalization was set to obtain complete CTV coverage with 90% of the prescribed dose. Graphic material of the treatment and follow-up were recorded.

Results: Results of the excellent response to treatment are presented in graphic format. Pictures of the lesion evolution before, during, and 1-3-5-12 months after treatment are shown.

Conclusions: Contact brachytherapy can be considered as therapeutic choice in highly evolved non-melanoma skin cancer in elderly patients where EBRT or invasive BT is unfeasible.

COMPARISON OF TWO PROTRACTED ^{192}IR-HDR-SCHEDULES IN POSTOPERATIVE ENDOMETRIAL CARCINOMA

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Objectives and purpose: To analyze toxicity and vaginal-cuff-relapses(VCR) in two protracted brachyterapy (BT) schedules after surgery for endometrial carcinoma (EC).

Material and methods: 319 patients(p) with EC staged as I-IIIC after surgery. External beam irradiation (EBI) plus BT was considered for high-risk and stages II-IIIp and BT-alone for intermediate-risk p. From 2003-2007 (166 p): 3 fractions(f)/week(w) of 4-6 Gy after EBI (Group-1:125p) and 4-6 Gy in 6f/2w for BT alone (Group-2:41 p). From 2007-2011 the daily dose schedule in 94/153 p was 2f/w of 5-6 Gy after EBI (Group-3) and 5-6 Gy in 4f in BT-alone (Group-4:59 p). The mean EBI dose in Groups 1 and 3 was 44 Gy. BT was performed mainly using vaginal cylinders (median active length: 2.5 cm). Toxicity was prospectively assessed using the RTOG score for the rectum and bladder and objective criteria of LENT-SOMA for the vagina. Statistics: Chi-square and Fisher tests.

Results: Mean follow-up(months): Group-1: 68.08 (7.73-123.13); Group-2: 63.41 (21.2-108.56); Group-3: 41.46 (3.1-73.53); Group-4: 41.46 (19.23-87.90). Median overall BT-treatment time (days): Group-1: 5 (3-23); Group-2: 13(8-28); Group-3: 2 (2-12); Group-4: 6 (4-15). VCR: 5/320 p (1.56%). Group-1: 3 p; Group-2+4: 0 p; Group-3: 2 p. Late Toxicity: 1-Vagina: Group-1: 20.8% G1-2; 0.8% G4; Group-2: 24.4% G1-2; Group-3: 26.6% G1-2;1.1% G4; Group-4: 20.0% G1-2. 2-Bladder: Group-1: 0.8% G2,0.8% G3; Group-2: 2.4% G2; Group-3: 1% G1; Group-4: 0%. 3-Rectal: Group-1: 4% G1,2% G2; Group-3: 1.1% G1; 3.2% G2; 2.1% G3; Groups-2+4: 0%. No differences in toxicities were found between the two schedules for rectum (p=0.125), bladder (p=0.710) and vagina (0.680); on comparing Groups-2+4 vs. Groups-1+3, the latter had higher rectal toxicity (0=0.009) without differences in bladder (p=0.620) and vagina (p=0.667).

Conclusions: No differences were found in VCR and in rectal and vagina toxicities between the two BT-schedules. Rectal toxicity increased in EBI p. Treatment with the least number of fractions is preferable.

CORRELATIONS BETWEEN PRELIMINARY ULTRASONOGRAPHY AND 3DVOLUMETRY IN PROSTATE BRACHYTHERAPY

Pérez Aguiar, J.L.; Jiménez Calero, J.; Peña Perea, M.T.; Ferrera Alayón, L.; Dolado Correa, M.C.; Otón Sánchez, L.F.

Introduction: Prostate volume (PV) measurement is essential in prostate cancer and is estimated by transrectal ultrasound (TRUS). There are differences between the volume obtained by preliminary TRUS and intraoperative ultrasonography with threedimensional planimetry at brachytherapy (BCT).

Objectives: Quantify the correlation and differences between PV obtained by TRUS and BCT. To set an optimal model to measure the prostatic dimensions with TRUS minimizing the error when compared with the BCT volume.

Methods and materials: PV of 200 consecutive cases with prostatic cancer treated with brachytherapy in our Department were analyzed by a retrospective research in two phases: observational-descriptive and experimental-analytic designs.

Results: TRUS overestimates significantly (p-value <0,001) the BCT with a mean of 6.19 cm^3 CI 95% [5.05-7.33 cm^3]. Those differences are lower if remeasured maximum prostatic axes are used (4.057 cm^3 IC 95% [3.72-4.39 cm^3]). BCT estimated by preliminary TRUS could be more accurate, if we combine model Vol A (three axes through the center of the prostate) and model Vol C (three maximum prostatic axes, regardless of the slice or its perpendicularity) and applying the mathematical function: BCT=1.907+0.377 · Vol A+0.809 · Vol C.

Conclusions: PV is systematically overestimated by the usual TRUS measurement. We can better estimate PV with TRUS by standardizing measurement of maximum axes and applying the proposed mathematical function.

COSMESIS IN PATIENTS WITH NMSC TREATED WITH HDR BRACHYTHERAPY

Blanco Suárez, J.M.; Amendola, B.; Amendola, M.; Pérez, N.; Wu, X.

Introduction: Brachytherapy is a safe and efficacious treatment option in the management of skin cancer patients. It may be especially useful to treat irregularly shaped and difficult access lesions.

Materials: 38 patients ages ranging from 37 to 101 years with 41 non-melanoma skin cancers (NMSC) were treated between February 2003 and December 2014 with High Dose Rate (HDR) Brachytherapy using custom-made surface molds. A shortened HDR fractionated schedule of 10 fractions with 4.85 Gy or 5 Gy each given twice weekly in 5 weeks was used. The tumor dose was equivalent to the conventional external beam radiation therapy (EBRT), usually given in 30 fractions of 200 cGy/day. Individually designed applicators were used for; the size and shape of these varied according to the characteristics and location of the tumor. Cosmesis and acute and late toxicity were rated using Criteria for Adverse Events (CTCAE).

Results: The follow-up period ranged from 4 to 145 months (mean 85 months). Local control was 95%. Two patients (5%) developed recurrent disease. Good to excellent cosmetic results were achieved in all patients.

Conclusions: Based on this experience, the use of HDR brachytherapy delivered with custom made skin applicators for NMSC may prove to be especially advantageous for patients with NMSC in anatomical locations where surgery could be mutilating. It is also a viable option for treating older patients and those with busy schedules, in whom the alternative would be several weeks of conventional EBRT.

CUSTOMIZED HDR-BRACHYTHERAPY MOLD IN THE MANAGEMENT OF INOPERABLE HARD-PALATE CARCINOMA

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Purpose: To explore the feasibility of brachytherapy in 2 cases of inoperable hard palate carcinoma.

Methods and materials: We analyze 2 cases of two 84 years old patients with an inoperable T2N0 hard palate carcinoma treated in september of 2014 at our hospital. A customized maxillary mold made off acrylic resin with three 6-French catheters in every case were designed in collaboration with the dental technician from the maxillofacial surgery department.The catheters inside the resin mold, formed one single plane just next to the tumor. The lateral catheters were installed next to the lateral limits of the tumor. The anterior and posterior limits of the tumor were localized with metallic point sings joined into the mold. The inferior sides of the resin molds were made with 3 cm thickness in order to separate the tongue from the iridium source. A 3D CT scan dosimetry was performed to deliver a total dose of 35 Gy in 10 fractions of 3.5 Gy prescribed to the 100% isodose with a ^{192}Ir source.

Results: Both patients obtained a complete remission nearby 2 months after the treatment. With a follow up of 5 months none of the patients have suffered mucositis outside the tumor area, osteradionecrosis or weigh loss and they have not needed pain killers so far.

Conclusion: HDR brachytherapy with a resin customized maxillary mold seems to be a well tolerated alternative treatment to hemi-maxillectomy in inoperable patients.

DOSE ESCALATION WITH HDR-BRACHYTHERAPY IN HIGH-RISK-PROSTATE-CANCER: COMPARISON OF TWO CONSECUTIVE PROTOCOLS

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Purpose and objective: To compare Toxicity and Nadir+2 PSA Relapse-free Survival (RFS) in two consecutive dose escalation HDR brachytherapy phase II protocols used at the University of Navarre from 2001 to 2012.

Materials and methods: Patients with NCCN High and Very High Risk Prostate Cancer enrolled in protocols HDR4 (2001-2007, n=183) and protocol HDR2 (2007-2012, n=56) were analyzed. All patients received mini-pelvis EBRT to 54 Gy and 2 years of androgen blockade along with HDR Brachytherapy. HDR4 protocol consisted of four 4.75 Gy fractions delivered in 48 h while HDR2 protocol delivered two 9.5 Gy fractions in 24 h. Average EQD2 (alphabeta=1.2) Prostate D90 doses for HDR4 and HDR2 groups were 89.8 Gy and 110.5 Gy. Both groups were well balanced regarding risk factors. Prior TURP was more frequent in the HDR2 group (p=0.001).

Results: Median Follow-up is 3.5 years (range, 2-8). Rectal Toxicity grade ≥2 were HDR4=9.3% and HDR2=14.3% (p=ns) and grade ≥3 HDR4=1.6% and HDR2=3.6% (p=ns). Urinary toxicity grade ≥2 were HDR4=17.5% and HDR2=28.6% (p=0.07) and grade ≥3 HDR4=5.5% and HDR2=8.9% (p=ns). Six-year PSA RFS for HDR4 and HDR2 protocols were 84.2% and 87.8% (p=ns).

Conclusions: HDR4 and HDR2 Protocols produce similar results at the intermediate time point of 6 years. HDR2 patients have more grade ≥ 2 urinary events that can be partly explained by a higher number of prior TURPs. OAR constraints will be further refined in the ongoing HDR2 protocol.

DOSIMETRIC COMPARISON IN HIGH DOSE RATE BOOST 9 GY VERSUS 15 GY IN PATIENTS DIAGNOSED WITH HIGH GRADE PROSTATE CANCER

Soler Catalán, P.; Morales Marco, J.C.; García, V.; Andreu, F.; Tortosa Oliver, R.; Chinillach Ferrando, N.

Introduction: High dose rate brachytherapy boost in patients diagnosed with high grade prostate cancer, is nowadays, an accepted practice. We suggest two different ways of delivering the dose, 15 Gy and 9 Gy (if seminal vesicles are affected), in this group the coverage of 1cm. of seminal vesicles is needed.

Objectives: To compare the different dose constraints and values in the different boost groups, attending to the different PTV coberture required, and demonstrate there are no differences in the values and dose items analysed.

Methods: 120 patients prospectively recruited, diagnosed with high grade prostate cancer, underwent high dose rate brachytherapy boost.

The technique used was VMAT, as described below:

— 15 Gy boost (high risk):
  • 46 Gy pelvic areas (2 Gy/fraction), 23 sessions.
— 9 Gy boost group (seminal vesicles affected/T3b):
  • 46 Gy pelvic areas (2 Gy/fraction), 23 sessions.
— 14 Gy seminal vesicles and prostate (2 Gy/fraction), 7 sessions
— The dosimetric parameters analysed include: CI (Conformity index), COIN (Conformal index), DHI (Homogeneity index), DNR (Non-uniform dose ratio).

Results: The results analysed were consistent in both groups.

Conclusions: We conclude that, although the volume of treatment required is bigger in the 9 Gy boost, no difficulties have been seen in terms of the dose coverage and the constraints.

DOSIMETRIC COMPARISON OF LOOSE VERSUS STRANDED SEEDS IN PROSTATE BRACHYTHERAPY

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Purpose: To compare dosimetric differences of intraoperative and post-implant plans using loose seeds (LS) and stranded seeds (SS) 125-I permanent implants in low dose prostate brachytherapy.

Material and methods: Fifty-two patients were selected: 26 underwent LS permanent implant (selectSeed model; Isotron GmbH, Germany) and 26 patients SS (125STM1 model; CR Bard Inc, USA). Both plans, intraoperative with transrectal ultrasound (TUS) and post-implant with computed tomography (CT) were compared using the same parameters. For prostate dosimetry D90, V100, V150, V200, UV150, UD 30, RV100, RD 3 cm^3, dosimetric homogeneity index (DHI), seed and needle number and the nomogram were used.

Results: Intraoperative plans using LS showed overdosing for the clinical target volume (CTV) and urethra and less in rectum than using SS. Dosimetric coverage of intraoperative and post-implant plans and organs at risk constrains in both patient groups were suitable. Post-implant plans with SS had an statistically significant improvement in DHI. Using SS was no-migration detected, but 5 seeds migrated with LS. Seeds and needle number needed to reach dosimetric coverage was less with SS. Nomogram with LS has an slightly better fit, nevertheless both were consistent.

Conclusions: SS resulted in better dosimetric homogeneity showing less overdosing in CTV and urethra. No seeds migration was demonstrated with SS. More studies would be necessary to determine if these results will affect clinical outcome.

EARLY BREAST CANCER: PARTIAL BREAST IRRADIATION VS. WHOLE BREAST IRRADIATION

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Material and methods: A comparative study between two groups of patients with early breast cancer treated with conservative surgery matched for age, surgical technique, tumor size, nodal status and adjuvant treatment was performed. Control group received standard whole breast irradiation 50-60 Gy in 5-6 weeks and experimental group received free hand intraoperative multi-catheter breast implant (FHIOMBI) for perioperative HDR as PBI 34 Gy in 10 fractions.

Results: A total of 160 patients, 80 in control group and 80 in the experimental were analyzed. The median age and follow up were 56 vs. 60 years ($p>0.05$) and 55 vs. 33 months ($p<0.05$), respectively. No significant difference between complications rates were observed between the two groups. Minor complication (infection, seroma, bleeding) were recorded in 14 patients (8.7%), seven in each group and major complication (reintervention due to bleeding o dehiscence) in 2 patients (1.2%) one in each group. No significant difference between surgical time and hospital stay were observed between the two groups 97' (range 27'-309') vs. 123' (range 72'-234'), 2 days for each group. Significant differences between time from surgery to end of radiation were observed being 130 vs. 11 days in the control and experimental groups respectively. No local failure or distant failure were observed in both groups and excellent cosmetics results were recorded in more than 80% of both groups.

Conclusion: FHIOMBI is as safe and effective as standard whole breast irradiation but provides a significant improvements in logistical issues like reduction in overall loco regional treatment.

HDR BRACHYTHERAPY AS FOCAL THERAPY IN LOCALIZED PROSTATE TUMORS

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Purpose: To evaluate the technical feasibility, acute genitourinary (GU) and rectal toxicity after high dose rate (HDR) brachytherapy as focal therapy in one 24 Gy fraction.

Material and methods: We have designed a multicenter nonrandomized study phase II to evaluated the efficacy and tolerance of HDR brachytherapy as focal therapy for localized prostate tumors. Primary objectives are biochemical control and genitourinary and rectal toxicity. We have included patients with diagnosis of prostate adenocarcinoma T1c-T2b N0 M0, Gleason score ≤4+3 and PSA<15 ng/ml. Treatment is based on one 24 Gy fraction HDR brachytherapy guided by fusion multiparametric magnetic resonance imaging with transrectal ultrasound images in real-time and intraoperative planning is delivered. We propose transperineal hyaluronic acid injection into the peri-rectal fat to displace the rectal wall away from the radiation sources and in vivo dosimetry in all patiens. 6 patients have been included.

Results: The procedure were very well tolerated. No intraoperative or perioperative complications occurred. Acute toxicity grade 2 or more was not observed in any patients.

Conclusions: This technique is feasible and very well tolerated with very low rates of acute toxicity and should be offered to patients with selected criteria for focal therapy.

HDR BRACHYTHERAPY IN LOCALLY ADVANCED TONGUE CARCINOMA

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Objectives and purposes: Locally advanced tongue carcinomas (LATC) are managed with external beam radiation therapy (EBRT) and chemotherapy. We analyze the outcome of these patients when HDR brachytherapy is added as a boost.

Material and methods: From May 2000 to March 2014, 37 patients with LATC received a boost with interstitial plastic tubes HDR brachytherapy, most of them with 18-21 Gy in 6-7 fractions after 40-60 Gy EBRT. Mean age was 60, 31 men and 6 women, T2:9, T3:13, T4:6. In nine cases brachytherapy was used as a salvage treatment due to recurrences or second tumors (with previous EBRT).

Results: With a follow-up of 60 months, local control at 3 and 5 years was 70% and 52% (T2: 76-38%, T3: 80-67%, T4: 83-83%, salvage brachytherapy 55-37%). If salvage cases were excluded, local control was 76% and 58%. Disease free survival was 70% and 52% at 3 and 5 years. Disease-free from regional relapse was 88% and 81% (four cases were recurrences and three cases N+). Six patients developed distant metastasis with disease-free from distant metastasis of 81% and 76%.

Conclusions: HDR brachytherapy boost in LATC is able to increase local control compared with other published works with exclusive EBRT. In cases with previous EBRT and salvage brachytherapy more than one third can be controlled at long term. Brachytherapy should be considered in advanced boost carcinomas whenever feasible.

HEMIABLATIVE FOCAL LDR BRACHYTHERAPY: A PHASE 2 TRIAL PROTOCOL

Fernández Ots, A.; Bucci, J.; Chin, Y.; Malouf, D.

Background: The objective of focal brachytherapy is to provide effective cancer control for low-risk disease but with reduced genitourinary and rectal side effects in a cost-effective way.

Purpose: Phase II study examining technical and dosimetric feasibility and toxicity, QOL changes and local control with post-treatment biopsy outcomes in men with early stage low volume prostate cancer treated with focal brachytherapy with seeds I^{-125}.

Patients and methods: The study design is a prospective, multicenter trial with a planned sample size of 20 patients including men ≥60 years of age with a life expectancy estimated to be >10 years with low or low-tier Intermediate Risk Prostate Cancer, unilateral disease on the biopsy, Gleason ≤3+4, <25% cores involved, <50% cancer in each core. The investigations specific for the study are a Multiparametric MRI (baseline and at 18-36 months to rule out high grade disease and a Transperineal mapping biopsy (baseline and at 36 months) for more accurate patient selection. The hemigland region will receive 144 Gy. Standard normal tissue constraints will be considered as for a whole gland implant. Dosimetric parameters will be evaluated at day 30 after the implant.Toxicity and QOL will be evaluated with international validated questionnaires focusing on urinary, rectal and sexual domain, and general health related quality of life. The patients will complete this assessment at baseline and then approximately every 6 months after the implant up to 10 years.

Results and conclusions: Study design and implementation will be outlined.

HIGH-DOSE-RATE (HDR) INTERSTITIAL BRACHYTHERAPY FOR PENILE CANCER: A CASE REPORT

Cadavid, A.; Polo, A.; Escribano, M.C.; Domínguez, J.A.; Hervás, A.; Muñoz, T.; Ramos, A.

Background: Interstitial brachytherapy (IB) has been used as a conservative treatment for penile carcinoma (PC), with long-term local control rates ranging between 70%-90%.

Case report: A 58-year-old male without past significant medical history presented with whitish lesion of the distal third of the penis. A wide local excision and circumcision was performed. Additional workup for staging failed to reveal disease outside the penis. Histologic exam showed a well-differentiated PC. Six-months later he presented a local relapse on the glans penis with associated induration and impaired flow of urine. The patient was then referred to our Unit to asses treatment. Physical examination showed an erythematous area with a significant induration confined to the left part of glans penis together with a palpable ipsilateral inguinal lymphadenopathy but with negative results for malignancy on FNA-cytology. An interstitial implant was performed under spinal anesthesia with eleven metallic needles, guided by two plastic templates with holes arranged in four rows with equidistant spacing of 1 cm. The spatial reconstruction was performed using CT-simulation and dosimetry planning to supply 10 fractions (BID) of 5.2 Gy, equivalent to 65 Gy (EQD2). Once treatment ended surgical implant was removed without complications. At the discharge, the patient was stable and in good condition. Eight months after treatment, the patient showed no evidence of local tumor recurrence or distant metastases.

Conclusion: HDR-IB is a feasible technique that allows a conservative approach for localized PC, showing excellent results in local control and few side effects, including demonstrated preservation of sexual function.

INTERMEDIATE-RISK PROSTATE CANCER TREATED BY PERMANENT 125-IODINE IMPLANTS: 13 YEARS OF FOLLOW-UP

García Blanco, A.S.; Anchuelo Latorre, J.; Ferri Molina, M.; Kannemann, A.; Cardenal Carro, J.; Sánchez Mazón, J.; Prada Gómez, P.J.

Background: Low dose rate (LDR) prostate brachytherapy alone in intermediate risk (IR) prostate cancer is controversial. We analyzed oncologic outcome, side-effects and complications after I-125 brachytherapy as monotherapy in an important cohort of only IR cancer prostate disease.

Methods: Between March 2000 and December 2004, 122 consecutive patients with IR prostate cancer were treated with brachytherapy alone. The median follow-up was 122 months. No patients received external beam radiation and 51% received hormone therapy before brachytherapy, this therapy was given for 6-12 months. Biochemical failure was defined according to the "Phoenix consensus".

Results: For the entire cohort of 122 patients, 20 had evidence of biochemical relapse, 9 had a clinical relapse and 4 died from prostate cancer; 7 patients died of other illnesses. The 13-year actuarial biochemical control was 82. The multivariate Cox regression analyses no identified independent prognostic factors for biochemical failure. When stratified by two individual risk factor (Gleason and pretreatment PSA). The 13-year actuarial biochemical control was 81% and 87% respectively (p=0.48) for patients Gleason 10 and Gleason 7 and PSA<10. No patients reported incontinence after treatment. Acute urinary retention was seen in 3 (2.4%) patients. Genitourinary (GU) grade II toxicity was 5% at 12 month.

Conclusions: The excellent long-term results and low morbidity presented demonstrate that brachytherapy alone is an effective treatment for IR prostate cancer.

INTRAOCULAR MEDULLOEPITHELIOMA IN A CHILD TREATED WITH BRACHYTHERAPY: CASE REPORT

Reyes, J.A.; Escribano, A.; Romero, A.; Glaria, L.; Silva, D.; Castaño, A.; Colmenar, A.; Miralles, L.; Mañas, A.

Background: Intraocular Medulloepithelioma is a rare embryonal tumor, arises from the nonpigmented ciliary epithelium

of the pars plicata, and rarely in the iris, retina, or optic nerve head. Ciliary body medulloepithelioma most commonly occurs in children at a median age of 2 to 5 years and is rare in adults. However population-based information on incidence is not available. It is a slow growth tumor and can cause multiple secondary complications including secondary neovascular glaucoma, lens notching and subluxation, neoplastic cyclitic membranas.

Case report: A 5-month-old boy who initially presented with an opacity in the lens was admitted to our hospital in November 2014. Ocular Ultrasound showed in the right eye, behind the iris, a well-defined nasal tumor of mixed echogenicity with a small hypoechoic areas. The left eye was normal. On December 2015, the tumor was treated with ocular brachytherapy (Ruthenium-106), the total dose given was 40 Gy in to the apex. Not acute toxicity have been reported. An intraoperative fine needle aspiration cytology was performed, the pathology examination revealed a medulloepithelioma tumor.

Conclusion: Radiotherapy can be considered a therapeutic option in these tumors. External beam radiotherapy show a mild response, but the brachytherapy remains an alternative for smaller tumors. In a series of 3 cases used brachytherapy with a dose of 40 Gy show a slow tumor regression with control in all cases and no recurrence over a median follow-up period of 1 year. And there are no significant risks to take into account with this treatment.

INTRAOCULAR METASTASIS AS PRESENTATION OF SYSTEMIC CANCER

Alonso Martínez, P.; Diezhandino García, P.; de Frutos Barajas, J.; García Álvarez, C.; Saornil Álvarez, M.A.; Miguel Pérez, D.; López-Lara Martín, F.

Introduction: Intraocular metastases are the most common malignant intraocular lesion observed in up to 4–12% of necropsy series of patients with solid cancer. However, they are unfrequented reasons for consultation in ophthalmology clinics. In many cases they could be the presentation of the systemic cancer. The purpose of this investigation is to review the frequency of intraocular metastasis in an ocular oncology clinic, and to describe the profile of the patients when is the first sign of systemic cancer.

Material and methods: Between January 1993 and December 2013, 21 intraocular metastases were diagnosed in the Intraocular Tumors clinic.

Results: Intraocular metastases occur preferentially in breast (47.5%) and lung (23.8%) carcinomas. 61.8% were women with a mean age 62.7 years. The main symptom was decreased vision. All the patients but one received treatment with chemotherapy 5 of them required adjuvant radiotherapy and 1 enucleation. In 13 (61.9%) of the 21 patients the ocular tumor was the presentation of an occult primary, with decreased visual acuity. The exudative retinal detachment is more common in the group of unknown primary tumor and 5 of them required radiotherapy. In the 5 patients with lung carcinoma the presentation of the disease was the ocular tumor.

Discussion: Intraocular metastasis could be the first presentation of an occult cancer. A correct diagnosis of ocular lesion gives the patient the early and appropriate treatment, a good quality of life and prognosis of their disease. Radiation therapy consistently shows rapid symptom alleviation, give up excellent local control and functional outcomes when chemotherapy fails to local tumor control.

IS IT NECESSARY TO ADMINISTER RECTAL ENEMAS BEFORE GYNECOLOGIC HDR-BRACHYTHERAPY?

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Introduction: During vaginal cuff brachytherapy (VCB), rectal enemas have been advised during low-dose rate (LDR). Our aim was to analyze the rectal dosimetric effect of rectal enemas during VCB during high-dose rate (HDR).

Material and methods: Forty endometrial or cervical cancer patients treated with postoperative VCB alone or combined with external beam irradiation were analyzed. No rectal preparation was performed before the first application. Two Fleet enemas were self-administered before the second application. The first the night before the procedure and the second enema, at home, before the hospital admittance. Rectal DVH were extracted. Comparisons between the first and second application were performed with paired non-parametric test.

Results: Thirty-six patients had an endometrial cancer and four patients had a cervical cancer. The mean rectal volume decreased significantly by 6.75±19.12 cc with rectal enemas (p=0.0313). However, a rectal volumen increase was observed in 16 patients in spite of the cleaning protocol (increase in 16 patients, 9.01±8.72 cc, and decrease in 24 patients, -17.26±16.80 cc). Rectal DVH parameters slightly worsened after administrated the enema but without any significance. A split subgroup analysis was carried out according to the type of rectal volume variation after the enemas administration.

Conclusions: Because of the lack of uniformity rectal changes after the rectal enemas administration, the rectal DVH differences according the rectal volume increase or decrease associated with the administration of enemas. No significant differences were observed.

LDR DOSE RATE BRACHYTHERAPY WITH A ROBOTIZED AUTOMATIC SYSTEM. OUR EXPERIENCE

Martínez Agra, M.; Willisch Santamaria, P.; Vazquez de la Torre González, M.L.; Ibáñez Villoslada, C.; Cespón Outeda, E.; Andrade Álvarez, B.; Teijeiro García, A.; Medal Francesc, D.; Triñanes Pérez, A.; Muñoz Garzón, V.

Goals: To analize our experience results in low risk prostate cancer treatment with low dose brachytherapy using a robotized automatic system.

Methods and material: We have analized 101 patients, who have been diagnosed of low risk prostate treated with low dose rate brachytherapy since 2011 in our unit. The patients have received one fraction of 145 Gy (120 Gy in relapse), with the Seedselectron system of Nucletron, which makes a train of seeds-stripers, unassembled and an automatic seed loading. The dosimetric criteria on CTV: D90>100%, D100>80%, V100>95%, V150<50%; Organs at risk: Urethra: D1%<160%, D10%<150%, D30%<130%, D0.1 cc<200 Gy, Dmx<200 Gy. Rectum: D2 cc<145 Gy, D1 cc<160 Gy.

Results: We have treated 101 male patients with an average of 66.1 years old (47-82). 40% of patients presented minimum irritative clinica as an acute toxicity and 2 patients presented acute retention of urine. The average of needles used was 17 and of seeds 53. Seed migration was observed in 5% of patients, without any complication (3 lung, 2 heart). 96% present controlled disease, 4% present biochemical disease (1% local relapse, 2% distant relapse). One specific cause death and two because other causes.

Conclusions: LDR brachytherapy with robotized automatic system allows homogenitazion fo the implant, and dismisses the professional variability. It is an effective treatment for low risk prostate cancer with minimum side effects and good local control.

LOCAL CONTROL IN YOUNG WOMEN USING HDR BREAST BRACHYTHERAPY BOOST

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Objectives and purposes: Young women with breast cancer have an increased risk of local recurrence compared to older women. In the boost/no-boost trial (EORTC 22881-10882), women aged 40 or younger, had a 10-year relapse rate of 24% with 50 Gy whole breast irradiation, that declined to 13.5% with the use of a boost of 16 Gy. But even with this boost, the relapse rate at 20 years achieves 24.4%. We analyze the effect of a HDR brachytherapy boost in a single fraction ("fast-boost") in women aged 40 and younger.

Material and methods: We studied 72 patients with conserving-surgery and free margins, treated with 50 Gy whole breast irradiation plus interstitial brachytherapy, a single fraction of 7 Gy in an outpatient basis. The clinical target volume was based on clinical assessment.

Results: 10-year breast failure was 5.6% in the whole group. In 27 patients aged 35 and younger we obtained a 10-year local failure rate of 11.5%. No G3 late complications. Cosmetic results were good or excellent in more than 90% of cases.

Conclusions: Interstitial HDR brachtytherapy following radiation to the whole breast is a safe and very effective technique to boost the tumor bed in young women with early breast carcinoma. A single dose of 7 Gy ("fast-boost") is quick and well tolerated with few complications due to the high homogeneity delivered by the needle-technique. Local control in women aged 40 and younger is improved compared to published data. It is a very good way to preserve the breast.

LOW-DOSE-RATE BRACHYTHERAPY FOR PATIENTS WITH TRANSURETHRAL RESECTION. LONG-TERM RESULTS

Muñiz Delgado, A.; Kannemann, A.; García, A.S.; Anchuelo, J.; Ferri, M.; Cardenal, J.; Sánchez, J.; Prada, P.J.

Objectives: Our aim was to analyse the long-term oncologic outcome for patients with low and intermediate risk prostate cancer with transurethral resection that were treated using low-dose-rate (LDR) prostate brachytherapy.

Methods and materials: Between January 2001 and December 2005, 57 consecutive patients were treated with clinically localized prostate cancer. No one received external beam radiation. All of them were brought under LDR prostate brachytherapy. Biochemical failure was defined following the "Phoenix consensus". Patients were stratified as low and intermediate risk based on the "Memorial Sloan Kettering" group definition.

Results: The average follow up time for these 57 patients was 104 months. The overall survival under Kaplan-Meier estimates was 88% (±6%) at 5 years and 77% (±6%) at 12 years. The 5 and 10 years for failure in tumour-free survival (TFS) were 96% (±2%) respectively, while for biochemical control were 94% (±3%) at 5 and 10 years respectively, 98% (±1%) of patients being free of local recurrence. A patient reported incontinence after treatment (1.7%). The chronic genitourinary grade I were 7% and with grade II, 10%. At six months 94% of patients reported no change in bowel function.

Conclusions: The excellent long-term results and low morbidity presented, as well as the many advantages of prostate brachytherapy over other treatments, shows that brachytherapy is an effective treatment for patients with transurethral resection and clinical organ-confined prostate cancer.

LOW-DOSE-RATE PROSTATE BRACHYTHERAPY: RESULTS OF EXPERIENCE AT A SINGLE INSTITUTION

Domínguez-Rullán, J.A.; Hervás, A.; Polo, A.; Muñoz, T.; Sancho, S.; Vallejo, M.C.; Ramos, A.

Objectives: Prostate brachytherapy has been established as an effective treatment for localized prostate cancer. We reviewed the impact of clinical and pathological factors in biochemical failure and survival in patients treated with this technique.

Methods: 148 patients were treated with permanent I^{-125} seed implantation with prescribed dose to PTV of 145 Gy in the period between June 2002 and June 2006. Overall survival and biochemical-relapse free survival (BRFS) were calculated using Kaplan-Meier and differences between groups were assessed using de Log-Rank test.

Results: 134 patients with mean age of 70 (44-83) were classified as low risk (iPSA<10 ng/ml, Gleason≤6) and 13 as intermediate risk (iPSA 10-20 ng/ml, Gleason 7). The distribution of cases by T stage was T1c (75.5%), T2a/b (24.5%) and by Gleason Score was G<6 (11.6%), G6 (87.8%) and G7 (0.7%). 121 patients are alive (83.4%), 97 patients with bNED (83.47%), 7 with PSA failure (5.78%), 12 with loco-regional relapse (9.92%) and 1 (0.82%) with distant recurrence. Twenty-four patients died, six (4.1%) because of or with prostate cancer. All the patients were monitored for at least 3 years with mean follow-up of 96.03 months (95%CI: 62.28-129.78). Overall survival at 5 and 7 years was 93% and 86%, respectively and BRFS 5 and 7 years was 86% and 80%, respectively. PSA nadir <0.5 ng/ml was the only factor related with longer BRFR. Most urinary events were classified as Grade 1-2, only 7.7% developed Grade 3 toxicity.

Conclusions: Brachytherapy provides excellent long-term results with an aceptable toxicity profile. Further studies are needed to determine which factors could predict treatment outcomes.

OPHTHALMIC BRACHYTHERAPY FOR OCULAR MELANOMA: INSTITUTIONAL EXPERIENCE

Celada Álvarez, F.J.; Ortega, C.; Martínez Costa, R.; Chicas Sett, R.; Soler, A.; Carmona, V.; Farga, M.D.; Roldán, S.; Bernisz, M.; Tormo, A.

Objectives: Retrospective review of the institutional experience treating ocular melanoma with ophthalmic plaques with I^{-125} and evaluation of clinical and dosimetric data.

Material and methods: From 2007 to 2015, 30 treatments in 29 patients have been performed. The median age was 55 years (32-88). Ocular fundus examination, ultrasound and MRI were performed in order to provide the necessary information on tumor size and location. Depending on the tumor thickness the prescription point was determined. For >5 mm tumors the prescription point was the apex, and 5 mm for smaller tumors.

Results: Larger tumor diameter and thickness were 12 mm (5-23) and 6 mm (3-11). Median dose rate was 86.3 cGy/hour (64.99-114.7). After a median of 94.49hours (76.21-170) 85 Gy were reached in all cases according to the calculation model COMS. With dosimetric models updated with correction factors as the active length of the seeds, anisotropy, or disposal of sources, the median dose has been 69.91 Gy. Median follow-up was 20 months (1-90), with 31% of patients with more than 3 years

follow-up. There have been no severe acute complications after removal of the plaques and no severe late toxicities were registered. Persistence/local progression has been reported in 4 (13%) patients. In two of these cases margin from tumor to plaque was only 1 mm. Salvage treatment was enucleation in three cases and new brachytherapy in one case and always salvage treatment was performed in the three first years of follow-up.

Conclusions: In selected patients according to tumor size and location, ocular brachytherapy is a suitable option in order to avoid enucleation.

PATTERN OF RECURRENCE IN UVEAL MELANOMA TREATED WITH EPISCLERAL BRACHYTHERAPY

Diezhandino Garcia, P.; Garcia Alvarez, C.; Alonso Martínez, P.; Saornil Alvarez, M.A.; De frutos Baraja, J.M.; López-Lara Martín, F.

Objectives: Describe the timing, frequency and clinical characteristics of treatment failure after episcleral brachytherapy in patients diagnosed of uveal melanoma.

Methods: Prospective and consecutive non- intevencional case series of patients diagnosed of uveal melanoma treated with episcleral brachytherapy between 1995 and 2013.They were treated according to a standar protocol. The presence of growth tumor after treatment was defined as recurrence.

Results: 602 patients diagnosed of uveal melanoma, 248 were treated with episcleral brachytherapy. With a mean follow up of 78.2 months, 14 recurrences were detected. All tumors were choroidal and according COMS size classification, 2 patients had small tumors, and 12 medium. None had metastases at diagnosis. All patients received brachytherapy I^{-125}. Kaplan Meier analysis showed a median time to recurrence of 37.6 months (standard deviation 2.26). All eyes with growth tumor were enucleated. 3 patients presented distal metastases. There were statistically significant differences in survival of patients with recurrences.

Conclusions: In our series, there is a very low incidence of recurrence (5%), which approximates the incidence of other series. Of these, there is no specific clinical pattern that help to early detection. These recurrences worsen the prognosis of the patient.

PERIOPERATIVE HIGH-DOSE-RATE BRACHYTHERAPY IN LOCALLY ADVANCED AND RECURRENT GYNECOLOGIC CANCER: RESULTS OF A PHASE II TRIAL

Valtueña Peydró, G.; Juez Viana, L.; Matínez Fernández, M.I.; Olarte García, A.; Sala Elarre, P.; Cambeiro Vázquez, M.; Jurado Chacón, M.; Martínez Monge, R.

Purpose: To determinate the feasibility of perioperative high-dose-rate brachytherapy (PHDRB) as an adjunct to salvage surgery in primary advanced or recurrent gynecologic cancer.

Methods: Forty-five patients with either locally advanced (n=14) or recurrent (n=31) gynecologic cancer suitable for salvage surgery were included. Unirradiated patients were treated with preoperative chemoradiation followed by salvage surgery and PHDRB (R0 and R1 resections receiving 16 or 24 Gy, respectively). Previously irradiated patients were treated with salvage surgery and PHDRB alone with 32 or 40 Gy for R0 or R1 resections, respectively.

Results: Resections were categorized as R0 in 12 patients (26.6%) and R1 in 33 (73.3%). Four previously irradiated patients suffered fatal bleeding between 8 and 13 months after surgery and PHDRB. After a median follow-up of 4.1 years (range, 0.2-13.7+), 19 patients have failed (42.2%). Thirteen-year actuarial overall survival was 33.4%, with a median survival of 30.4 months.

Conclusions: Local and pelvic control results are excellent for this very high-risk-disease population.

PHASE-II-TRIAL OF DOSE ESCALATION TO INTRAPROSTATIC LESIONS WITH TRUS-MRI FUSION GUIDED HDR-BRACHYTHERAPY

Gomez-Iturriaga, A.; Casquero, F.; Urresola, A.; Ezquerro, A.; Canteli, B.; Espinosa, J.M.; Minguez, P.; Lopez, J.I.; Llarena, R.; Bilbao, P.

Purpose and objective: To demonstrate the feasibility, safety and effectiveness of dose escalation to Dominant Intraprostatic Lesion (DIL) as defined on multiparametric MRI (mpMRI) with Real-Time MRI-TRUS fusion High-Dose-Rate (HDR) Brachytherapy.

Materials and methods: 15 patients with intermediate-high risk Prostate cancer and visible dominant intra-prostatic nodule on mpMRI have been treated prospectively. The treatment consisted of combined MRI-TRUS fusion HDR-brachytherapy (1 fraction of 1500 cGy) and Hypofractionated external beam (3750 cGy in 15 fractions) (BED: 265 Gy). Within the usual dosimetric constraints, a dose of 1875 Gy was delivered to at least 98% of the DIL volume (V125%>98%) (BED: 351 Gy).

Results: Median age was 70 years, median prostate volume was 23.8 cc, median number of needles was 16 (13-18). Dose escalation to DIL was feasible in 14/15 patients (93%) without violating dosimetric constraints and 1 patient presented a minimal deviation of dosimetric restrictions. Median V100, V125, V150 and V200 to DIL were: 100, 99, 78.5 and 20% respectively. With a median follow-up of 10 months (range 9-16), none of the patients developed acute urinary retention, 2 patients presented acute GU-grade-2 toxicity, none of the patients developed chronic grade ≥2 toxicity. All patients returned to the pre-treatment IPSS level after 2 months of follow-up. In addition to standard PSA follow-up, response has been assessed by mpMRI at 12 months. All patients evaluated with MRI presented a complete response based on functional parameters.

Conclusions: This study demonstrates that dose escalation to DIL with MRI/TRUS fusion guided HDR brachytherapy is feasible, longer follow-up will demonstrate the safety and efficacy of this procedure.

PROSPECTIVE STUDY OF HIGH-DOSE-RATE I NTRAOPERATIVE BRACHYTHERAPY IN RECTAL CANCER

Villafranca, E.; Sola, A.; Arias, F.; Navarrete, P.; Asín, G.; Rico, M.; De Miguel, M.; Oteiza, F.; Ciga, M.A.; Tejeira, L.

Purpose: A high-dose-rate intraoperative brachytherapy (HDR-BT) technique for rectum cancer was developed for patients with circumferential margin afected in MRI afther preoperative chemoradiotherapy.

Methods and materials: Between 2010 and 2014, 14 patients with primary tumors were treated with external beam RT, chemotherapy with capecitabine, surgery, and HDR-BT. HDR-BT was only administered if the resection margins were ≤2 mm in the MRI afther 6 weeks of preoperative treatment. The flexible intraoperative template is Fleipburg flap® with 1 cm-spaced parallel catheters. Clips were placed during surgery to define the target area. A dose of 10 Gy was prescribed at a 1 cm depth from the catheters, this is 0.5 cm from the surface of the flap.

Results: Initial radiologic stage: T3 8p T4: 6p; N0:1p, N1: 4p; N2: 9p; pathological stage ather preoperative treatment:ypT0:

2p; ypT3: 8, ypT4:4; ypN0=:7p, ypN1:2p, ypN2:5p. circumferential margin: median 1.5 mm (0-10) afected in 5p: Two patients had severe toxicity: 1 hydronephrosis, 1 cutanea fistula. The median follow-up was 31 m (11-67 m). Overall, no patients had local recurrence, 4p (28%) had metastasic recurrence. The 3-year local control was 100%, Disease free survival 3 y: 57%. The overall survival was 3 y: 63%.

Conclusion: The preliminay results show a high level of local control with HDR-BT in this serie. It is necesary to confirm these results with a high number of patients.

REAL-TIME PLANNING IN HIGH DOSE RATE PROSTATE BRACHYTHERAPY

Lorente, M.; Torres Donaire, J.; Arjona Gutierrez, J.; Rios Asus, P.; Morera López, R.

Objectives: To describe the technique of real-time planning in high dose brachytherapy implemented in our department in combination with EBRT for patients with high and intermediate risk prostate cancer. To evaluate acute and chronic toxicity.

Methods: We have in our department Vitesse 3.0 software that allows us adapt the HDR equipment to perform prostate brachytherapy with the technique of real-time planning ultrasound-guided. This technique reduce overall time and avoid displacements of the patient and possible variations in volumes and implant. We have treated 19 patients diagnosed with intermediate and high risk prostate adenocarcinoma. Two treatment schemes were performed: scheme A: 10 Gy/1 fr. HDR-BT+60 Gy/30 fr. EBRT; scheme B: 15 Gy HDR-BT+37.5 Gy/15 fr. EBRT.

Results: The technique of real-time planning in high dose brachytherapy was performed without incidents and with good dosimetric optimization. G3 acute or chronic toxicity was not observed. We have reduced treatment times previously performed exclusively with external radiotherapy schemes. This technique allows to perform dose escalations safely and with minimal toxicity.

Conclusions: The technique with HDR real-time dosimetry optimizes treatment of prostate cancer efficiently, achieving dose escalation safely. That could impact our serie on disease-free survival and overall survival with longer follow-up.

RECURRENT EARLOBE KELOIDS TREATED WITH PERIOPERATIVE HIGH DOSE RATE BRACHYTHERAPY

Sánchez Paz, R.; Lozano Martinez, A.; Esteban, A.; Escobar, S.; Romero Borque, A.

Purpose: To analyze the results obtained in a prospective group of patients with recurrent earlobe keloids that have been treated with surgical excision and perioperative HDR brachytherapy in our institution.

Methods and materials: From February of 2008 to February of 2015, 15 patients affected of recurrent earlobe keloid have been treated with perioperative HDR brachytherapy in our institution. Most patients received adjuvant topical treatment like corticosteroid injection or intralesional cryotherapy. Between 1 to 3 6-French flexible plastic catheters were installed over the keloid scars just after the lesions got removed in the same surgical procedure. In every patient, after a theoretical dosimetry was performed, a total dose between 12 to 20 Gy was delivered, in 4 fractions separated 6 hours between fractions and the total dose was delivered in the first 2 days after the excision.

Results: Every patient completed the treatment. After a follow up of 6 years, no patient suffered a keloid recurrence. Grade 1 dermitis was achieved in twelve patient around 15 day after the brachytherapy treatment that did not maintain more than one month in any case. Grade 1 fibrosis was achieved in 6 patients. No cases of chronic pruritus were achieved. Cosmetic results were considered to be good or excellent and no skin pigmentation changes were observed.

Conclusion: Perioperative intersticial HDR brachytherapy is an effective and well tolerated treatment for earlobe keloid scars, that achieve a better dose conformation over the irregular earlobe anatomy than teletherapy and obtains an excellent rate of local control.

SALVAGE BRACHYTHERAPY IN ANAL CARCINOMA. A CASE REPORT

Sierra Marin, M.; Fuertes Velez, F.J.; Reta Decoreau, I.; Lorenzana Moreno, P.; Urquilla, K.B.; Egilior Olabarrieta, J.D.; Barrondo Azkorra, B.; Martin Urreta, J.C.

Epidermoid anal carcinoma is uncommon disease. Until recently, diagnosis of anal cancer meant mutilating abdominoperineal resection and permanent colostomy. However, different trials confirmed the benefit of chemoradiation (CRT). CRT resulted in 5 year patient survival rates are similar or even superior to surgery. We present a 51 year old female patient who referred symptoms consisting of constipation, pain and rectal bleeding. In the physical exploration an indurated lesion was palpated on the left anal margin. In the colonoscopy an ulcerated lesion of 5.5×2 cm was noted, the biopsy confirmed the epidermoid anal carcinoma. The CT showed the anal lesion without other local or distant lesions. The patient underwent CRT consisted on 5-Fluoroucil and Mitomycin C plus radiotherapy with IMRT techique at a dose of 54 Gy. A residual lesion of 1.5×1 cm was observed on follow-up colonoscopy at 3 months and a biopsy confirmed the malignancy of the lesion. A new CT was realized that confirmed disease only at anal level. With these findings, we decided together with tumors committee, perform a salvage HDR Brachytherapy (BT). Needles placement and 3D-planning were performed by anal applicator and CT. The patient was treated by 7 fractions of 4 Gy. After BT the patient presented mucosytis and radiodermatitis G2-G3 as acute toxicity. On follow-up colonoscopy at 3 months an erythematous area was observed and the biopsy revealed secondary changes because of the radiotherapy without signs of malignancy.

SALVAGE HDR BT ACUTE TOXICITY AFTER RT FOR PROSTATE ADENOCARCINOMA

Sierra Marín, M.; Fuertes Velez, F.J.; Lorenzana Moreno, P.; Urquilla, K.B.; Egilior Olabarrieta, J.D.; Barrondo Azkorra, B.; Reta Decoreau, I.; Martin Urreta, J.C.

Purpose: Evaluate the acute toxicity of patients with recurrence of prostate cancer treated with salvage Ir 192 high-dose rate brachytherapy (HDR BRT).

Materials and methods: From August 2012 till January 2015, 10 Patients with recurrence of prostate cancer have been treated with salvage HDR BRT in our center. Clinical recurrence was confirmed by biopsy in all cases after bioquemical failure and imaging studies (CT, MRI, choline PET/CT). There were 4 patients with recurrence localized in prostate, 4 in seminal vesicle, 1 in prostate and seminal vesicle and 1 patient had a nodule in bladder neck. Needle placement was performed by transrectal US and therefore, CT based 3D planning in all cases. 9 patients were treated by a single dose of 19 Gy and 1 patient with 2 fractions of 9 Gy. Urinary and gastrointestinal toxicity were evaluated

one month after treatment and then every 4 months, using the RTOG/EORTC scale.

Results: 5 Patients had no urinary symptoms, 3 patients presented a urinary toxicity G1 and two of them G2. 6 Patients had no gastrointestinal toxicity, 3 patients presented a gastrointestinal toxicity G1 and 1 patient G2.

Conclusions: Salvage HDR BT could be an optimal treatment in selected cases with low toxicity profile, although it would be necessary to have a larger amount in regard to acute toxicity concerns of patients.

SALVAGE IODINE-125 BRACHYTHERAPY FOR LOCAL PROSTATE CANCER RECURRENCE AFTER RADIOTHERAPY

Chicas Sett, R.A.; Celada, F.J.; Roldan, S.; Burgos, J.A.; Soler, A.M.; Garcia-Mora, M.C.; Collado, E.; Farga, D.; Gimeno, J.; Tormo, A.

Purpose: The aim of the present prospective study is to analyze intermediate-term outcomes and toxicity after salvage brachytherapy (BT) with I^{-125} in prostate local recurrence after BT or external beam radiotherapy (EBRT).

Methods and materials: From January 2010 to January 2015, 32 patients was analyzed with PSA relapse and histological confirmation, underwent salvage-BT with I^{-125} at least 2 years after the initial treatment (16 BT and 16 EBRT). After histological confirmation, patients received LDR-BT between 120-130 Gy. Magnetic resonance imaging and/or Choline-PET-CT as study of distant disease were realized in every case. At relapse, average age was 71 years (58-82); median Gleason was 7 and PSA pre-salvage BT 5.27 ng/ml (2.81-11.7). Eight (25%) patients were treated with androgen deprivation therapy previously salvage-BT. The median dose to 90% of prostate volume was 128.17 Gy with a median seed activity of 0.478 mCi (0.319-0.522). Constraint median doses for urethra and rectum were 162 Gy and 120 Gy, respectively. Toxicity was scored according CTCv4.0.

Results: Median follow-up of 30 months (6-59): 23 (71.8%) patients are free from biochemical failure, 7 patients have developed PSA relapse with distant failure evidence, 2 patients presented PSA relapse within the first 6-12 months after salvage-BT. The toxicities found corresponding to: one case grade 3 (TURP after acute urine retention) and three cases grade 2 (2 acute rectal mucositis and 1 acute cystitis).

Conclusions: Despite of the short follow-up in some patients, BT seems to be a safe and effective treatment option for salvage treatment, but careful patient selection is essential to improve outcomes.

SCAMOUS CELL CARCINOMA OF COLUMELA AND NASAL VESTIBULE: A REAL EXAMPLE

Fernandez Cordero, M.J; Dominguez Rodriguez, M.; Delgado Gil, M.M.; Bayo Lozano, E.

Objectives and purposes: The objective here is to make clear that with brachytherapy techniques excellent disease control rates are achieved with better aesthetic results. What is striking about this case is its rare and difficult surgical management location for the aesthetic consequences that could involve.

Materials and methods: We chose to use a technique of brachytherapy at plesiotherapy modality. We administrated a total of twelve sessions on alternate days for four weeks with a fractionation 4 Gy per sesión during July-August. The total dose was 48 Gy with BED 70 Gy. We used 3D planning and virtual simulation with short immobilization through thermoplastic mask on which PTV was defined and was covered by tubing system positioned according Paris System.

Results: In the periodic reviews during the treatment, radiodermitis II-III in the target área and upper lip mucositis was observed. After two months of radiotherapy, clinic and radiological lesions complete remission is evident without aesthetic or organic sequels at this level. At the moment, the remission remains complete.

Conclusions: In tumours of difficult surgical Access that involve important aesthetic alterations, the plesiotherapy modality brachytherapy is a good therapeutic option. We achieved complete responses without late toxicities that condition the quality of patients´ life.

SINGLE FRACTION HDR-BT AS PRE-TREATMENT EBRT BOOST IN PROSTATE CANCER

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Purpose: To assess the toxicity of combined therapy between external beam radiation therapy (EBRT) and high dose rate brachytherapy (HDR-BT) as a boost in patients with intermediate or high risk prostate cancer.

Methods and material: From August-2010 to February-2015, a total of 242 patients were treated with EBRT plus HDR-BT. Median age was 72 years (range 52-85). Most patients (68%) were classified as high-risk and 70 patients (32%) were considered intermediate-risk. MRI determined the stage of tumor. First received HDR-BT as boost and 4 gold fiducials were implanted. EBRT (IMRT), subsequently, was made through IGRT (CBCT and KV). The patients received HDR-BT as a single 15 Gy/9.5 Gy implant, followed by EBRT to 46/60 Gy depending if was presented seminal vesicles invasion. The constraints indicated in the GEC/ESTRO recommendations have been respected (Rectum D2cc≤75 Gy EQD2; Urethra D10≤120 Gy EQD2). GI and GU toxicity was evaluated utilizing the RTOG and CTCv4.0 criteria. Median follow-up was 30 months.

Results: No treatment failure has been observed to the last follow-up. The incidences of any acute ≥ Grade 2 GI or GU toxicities were 0% and 9% respectively. Dysuria and urgency was prevalent symptoms in acute GU toxicity. Late genitourinary toxicity included 2 patients (0.9%) with urine obstruction requiring intermittent/permanent catheter. One case of grade 2 gastrointestinal late toxicity presented actinic rectitis event.

Conclusion: The use of a single fraction HDR-BT as pretreatment EBRT boost provides early-term and good outcomes in treatment-related toxicity. These data can help physicians to assess this scheme of radiotherapy as an acceptable option in the prostate carcinoma treatment.

SPINAL CORD COMPRESSION IS A MEDICAL EMERGENCY THAT REQUIRES IMMEDIATE TREATMENT

Alonso, A.; Querejeta, A.; Alonso, R.; Alonso, D.; Orduz, C.; Olay, L.

Material and methods: 52 patients with spinal cord compression treated between 2009-2011 with exclusive radiotherapy in our Center.

Characteristics: 28 men, 24 women. Most common primary tumors: prostate, not affiliates primary, lung... Location: 38 cases affecting the dorsal spine, cervical spine in patients 5 and 8 at the lumbar level. 1 case of involvement of all vertebral areas. Clinical presentation: pain in 32 cases, neurological deficit in 17 cases. 1 case with both symptoms and 2 incidental findings. Radiological image: mass of soft tissue in 30 patients and fracture

- crushing in 20 cases, 2 with both radiological findings duration of symptoms to RT: from 0 days to 6 months with a median of 15 days. More frequent treatment schemes: 30 Gy 10 fractions, 8 Gy in a fraction, 20 Gy/5 fractions...

Results: After RT, in 17 cases with neurological clinic there was complete response in 3 cases, partial response in 3 cases and no changes in 11. Improvement in 62% of cases occurred in 32 patients with pain. After treatment the median survival is 41 days with a range between 1 and 1550 days.

Conclusions: Radiotherapy is a treatment used commonly in spinal cord compression. There is a clear dose and fractionation scheme. Radiation therapy is effective for improving pain and neurological clinic.

TOXICITY DIFFERENCES BETWEEN TWO DIFFERENT SCHEDULES USED IN VAGINAL CUFF BRACHYTHERAPY FOR THE TREATMENT OF THE UTERINE CARCINOMA

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Purpose and objectives: An important treatment in the management of uterine carcinoma is endocavitary brachytherapy. We implemented this technique in 2008 and used as a boost after pelvic radiotherapy or as radical treatment depending on the disease stage. We used two different schedules since the implementation of this technique, the objective of our study is to evaluate the toxicity produced by the treatment and compare between the two schedules employed.

Materials and methods: The unit used to administer the treatment was a Varian Gammamed Plus, and the applicator used in all cases was a vaginal cylinder with diameters of the segments between 20 mm and 35 mm. Planification and dosimetry was performed using Brachyvision software. We used 2 different schedules:

— From September 2008 to September 2012: Treatment after external radiotherapy (46 Gy): 15 Gy in 3 sessions separated at least 48 hours. Treatment with exclusive brachytherapy: 30 Gy in 6 sessions separated at least 48 hours.
— From October 2012 to November 2014: Treatment after external radiotherapy (46 Gy): 14 Gy in 2 sessions separated at least 48 hours. Treatment with exclusive brachytherapy: 28 Gy in 4 sessions separated at least 48 hours.
— Toxicity was recorded according to RTOG criteria before every session. We compared the toxicity observed in the different schedules. We evaluated the bladder, rectal and vaginal toxicity in every patient.
— We divided the patients in two groups, the patients that made external radiotherapy (brachytherapy as a boost) and the patients that made exclusive brachytherapy.

Results: We evaluated 261 patients. 88 patients treated with external radiotherapy and boost with 15 Gy in 3 fractions, 42 patients treated with external radiotherapy and boost with 14 Gy in 2 fractions, 84 patients treated with exclusive brachytherapy with 30 Gy in 6 fractions and finally 47 patients treated with exclusive brachytherapy with 28 Gy in 4 fractions. There wasn't any grade 3-4 toxicity.

Conclusions: There is only low grade toxicity in the treatment with brachytherapy as a boost or exclusive treatment in uterine carcinomas. There are no significant differences between the toxicity observed in the two schedules employed in our department but the vaginal toxicity tends to significance in favour of the short schedule in the case of exclusive brachytherapy (4 fractions of 7 Gy each one).

TRAVELING HDR-BRACHYTHERAPY: EFFICIENT TO MAXIMIZE RESOURCES AND IMPROVE RADIATION PROTECTION

Guardado Gonzales, S.; Chávez Jiménez, T.C.; Cabello Murillo, E.; Díaz, R.; Aylas Guzmán, M.K.; Ferrando, A.; Fernández Bedoya, V.; Hernando, J.; Crespo, P.; Pérez-Regadera Gómez, J.F.

Introduction: Low dose rate brachytherapy (LDR-BT) with Ir 192 (skin tumors, lip, oral cavity, vulva and penis cancer), I125 (prostate cancer) and Cs 137 (cervix and endometrial cancer) is a well -established technique in our institution. Plesiotherapy for skin tumors, was initiated in 2005 and Ir 192 high rates interstitial brachytherapy (HDR-BT) for gynecologic brachytherapy in 2007. Because of LDR I192 disappearance in April 2014, we improved HDR.

Purpose: The aim of this report is to assess the advantages of traveling HDR-BT.

Materials and methods: Seven traveling implants (2 lip cancer, 1 rescue bed mastectomy, and 4 skin tumors), two hospitalized implants (in vulva cancer) and 6 plesiotherapy (skin tumors) were performed from January 2015 to March 2015. Patients are treated twice per day between 8 am to 3 pm (with an interval of 6 hours). As an exception, the second session of the first treatment day is administered later than 3 pm, because of the time needed for the radiotherapy treatment planning. Due to the number of beds available in the radio operating room, there is no limitation on the number of patients that can be treated. Radiation protection of family and staff is guaranteed by using a projector automatic source. No acute toxicities were reported.

Conclusions: Traveling HDR-BT is an efficient and well tolerated technique and allows us to treat more patients with lower cost, and ensures radiation protection.

TWO KINDS OF INTERSTITIAL-BRACHYTHERAPY IMPLANTS FOR APBI: A DOSIMETRIC COMPARISON

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Purpose: To evaluate the dosimetric parameters of two different implant systems in accelerated partial breast irradiation (APBI) with interstitial brachytherapy.

Material and methods: Six selected post-lumpectomy patients that meet the GEC-ESTRO criteria for APBI are included in this analysis. Simulation plans are performed for each patient with both implant systems: the classical one according to the "Paris system" (16 mm of distance between the catheters in a triangle disposition) and a peripheral implant consisting on placing the catheters 5 mm far to the peripheral limit of the target (previously decided with a CT scan preplan) separating 10 to 15 mm between them and adding 2 to 4 catheters in the middle of the volume to treat if required. Dose homogeneity index (DHI) and overdose volumes are compared. Prescribed dose was 34 Gy in 10 fractions for all cases.

Results: The peripheral planes system with normalization to the PTV points obtains a mean DHI of 70% (62%-79%) whereas the Paris system obtains values of 43% (38%-51%) with normalization to the PTV points and 42% (36%-54%) normalizing to the basal points. Thus, it shows the importance of the kind of implant selection in APBI using interstitial brachytherapy.

Conclusions: The peripheral planes system is shown to be an optimal interstitial implant that obtains a better dose conformation of the target and an improvement of control of high overdosages, with a benefit in the DHI greater than 25% over the classical interstitial implant.

US-BASED PROSTATE BRACHYTHERAPY: TECHNIQUE IMPLEMENTATION AND DOSIMETRIC ANALYSIS

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Objective: To describe the procedure, the evolution of the technique and the protocol, as well as the dosimetric outcomes of ultrasound-planned high-dose-rate prostate brachytherapy in a single institution.

Methods and materials: Between Nov´11 and Nov´14, ninety patients with biopsy-proven prostate cancer were treated with either two fractions of 13.5 Gy to the entire prostate (monotherapy) or with a combination of EBRT and HDR-brachytherapy: 56 Gy/28 fractions+10.5 Gy/brachytherapy boost in the early patients and 37.5 Gy/15 fractions+15 Gy/brachytherapy boost once the technique was well established and VMAT treatment available.

Results: Tumor, treatment and protocol characteristics are described in Image 1. Mean percentage of prostate receiving prescription dose (V100) was 97.9%. Mean V150 (percentage of prostate volume covered by the 150% isodose) was 33.9%. The mean urethral maximum dose was 129%, 121.7% and 116.6% in patients receiving 10.5 Gy, 13.5 Gy and 15 Gy, respectively ($p<0.001$). The mean rectal maximum dose was 81.6%, 77.5% and 73.3% in patients receiving 10.5 Gy, 13.5 Gy and 15 Gy respectively ($p<0.001$). Three acute urinary retentions have been described (3.3%).

Conclusions: US-based HDR-prostate brachytherapy is fully operational in our institution. More restrictive constraints have been undertaken once the learning curve has lapsed. Further follow up is required to investigate the effects of this restriction and to perform toxicity and survival analysis.

HEAD AND NECK

^{18}FDG-PET-CT IN ELDERLY PATIENTS WITH HEAD AND NECK CANCER

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Purpose: To assess the use of ^{18}FDG-PET-CT in staging and radiotherapy management in patients over 70 years old with head and neck cancer (HNC) through our experience.

Materials and methods: Radiotherapy (RT) planning was performed with ^{18}FDG-PET-CT in 23 consecutive patients (pts.). A contrast-enhanced CT was performed at diagnosis in 20 pts. Both studies were compared to detect changes in staging. Male/female: 21/2. Mean age: 74.65 years (range 71-86). Primary tumor site: 4 (17.39%) oral cavity, 4 (17.39%) oropharynx, 1 (4.35) hypopharynx, 2 (8.70) nasopharynx, 12 (52.17%) larynx. Clinical tumor stage: 4 (17.39%) II, 3 (13.04%) III, 13 (56.52%) IVa, 2 (8.70%) IVb, 1 (4.35%) IVc.

Results: In 7 (30.44%) of 20 pts. a difference in ^{18}FDG PET-CT staging was found: over-staged in 2 (8.70%) and down-staged in 5 (21.74%); distance metastases were detected in 1 pt. and synchronous tumor in 2 pts. The intent of RT turned out into palliative in 3 (13.04%) pts. A radical intention was maintained in 18 (78.26%) pts. (2 underwent surgery, 2 surgery+adyuvant RT, 6 RT+Cisplatin, 7 RT+Cetuximab, 1 exclusive RT). Two pts. were not treated (exitus). RT was completed in 17 (89.47%) pts. and chemotherapy (CT) in 7 (50%). Acute toxicity reported: mucositis 14 pts. and radiodermatitis 13 pts. A rescue surgery was performed in 4 pts.

Conclusions: ^{18}FDG-PET-CT is a useful tool for staging and treatment planning. Radical radiotherapy is feasible in elderly people. Age should not be the only factor to indicate less intensive treatment.

7-YEAR EXPERIENCE OF ^{18}FDG PET-CT, IMRT AND IGRT IN NASOPHARYNGEAL CARCINOMA (NC)

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Purpose: IMRT, IGRT and ^{18}FDG PET-CT planning have shown a contribution not only in the accuracy when outlining target volumes but also in the delivery of the radiation treatment. The purpose of this study is to assess the impact of the use of these techniques in patients with NC.

Methods: All patients with NC treated with IMRT, planned with ^{18}FDG PET-CT and verified with IGRT at our institution have been included.

Results: A total of 25 patients with NC have been treated between 2008 and 2013 with radical intention. The mean age was 52 years (range 16-66). The 96% of the sample received concomitant Chemotherapy based on CDDP and the 88% used a gastrostomy feeding tube inserted prophylactically before the beginning the treatment. Planning simulation was performed with ^{18}FDG PET-CT in the 100% of the sample and 12 (48%) with MRI. All patients received radiation therapy with Steep and Shoot IMRT. Prescription dose was 66 Gy in 30 fractions with an integrated boost of 2.2 Gy/fx in areas with macroscopic involvement and 54-60 Gy in 30 fractions of 1.8-2 Gy/fx in the regions at risk of microscopic spread. IGRT (Cone Beam CT) was used for treatment verification in all the cases. DVH were assessed according to institutional constraints. Mean follow-up was 24.7 months (median: 22 months; range: 8.2-75.4 months). Up to date, 24 out of 25 patients are in complete response 1 and 2-year Local Failure Free Survival (LFFS) is 100% and 94.4% respectively. 88% of patients completed treatment without interruptions.

Conclusion: IMRT, IGRT and ^{18}FDG PET-CT are perfectly integrated in the clinical management of patients with NC allowing the improvement of historical clinical results.

ADENOID CYSTIC CARCINOMA OF SALIVARY GLAND: EXPERIENCE IN OUR HOSPITAL

Campos Triviño, B.M.; Quintana Angel, B.; Flores Rodriguez, J.D.; De Haro Piedra, R.; Ortiz Gordillo, M.J.

Introduction: Adenoid cystic carcinoma is a malignant salivary gland tumor with a high rate of local recurrence. Is less than 1% of head and neck tumors.

Materials: In the last five years have been diagnosed 24 patients with adenoid cystic carcinoma in our hospital. We analyzed: sex, age, overall survival, clinical stage, and positive margins after surgery, radiotherapy.

Results: The age of the patients analyzed varies between 43 and 94 years (mean 59.3 years) and 85% are women. The most frequent location was the oral cavity (7 cases), followed by parotid (5 cases). Were treated with radiotherapy in 10 patients independent total involvement of margins with doses ranging between 60 and 70 Gy. The maximum follow-up was twelve. One patient with perineural invasion but with complete response after 24 months of follow-up was found. A case with distant metastases during the first 5 years.

Conclusions: With respect to local control was not significant margin status. Of patients treated with radiotherapy, two had local recurrence at 6 months and 3 years after treatment in reviews coincides with the time described. The radiotherapy should be used in cases of unresectable or affections margins and in patients unfit for surgery. The elective treatment with surgery or radiation of lymph node chains provides no survival benefit. Nearly half of patients develop distant metastasis at 5 years and local recurrences tend to build on. This finding deserves a long-term monitoring of patients with this pathology.

ADENOID CYSTIC CARCINOMA OF TRACHEA. A CASE REPORT

De la Rúa Calderón, M.A.; Alonso Pantiga, J.R.; Alonso Sánchez, D.; Cucarella Beltrán, P.; Orduz Arenas, C.

Objective: To report a case of a patient diagnosed with adenoid cystic carcinoma of trachea (ACCT) treated with incomplete surgery followed by radiotherapy. ACCT is a rare tumor location (1/1000 cases of respiratory tree tumors). It occurs with equal frequency in both sexes. It is not related to smoking. Its malignant character is defined by its recurrence and local invasión. Metastasis being usually more delayed. Local recurrence is the most common cause of death. Surgical resection is the mainstay of treatment often combined to radiotherapy because of positive surgical margins.

Material and methods: We reviewed the clinical records of this patient diagnosed in 2010.

Results: A 53 years old man presented with progressive dyspnea for several months, night stridor in recent days and occasional dysphagia. Cervical CT scan revealed a 3×2.3×1.9 cm tumor involving posterior tracheal wall and occupying almost all the light with air pass by 2 mm. It invades hypopharynx and esophagus. Urgent tracheoplasty and subtotal tumor removal was performed and made a surgical airway. Pathological diagnosis was adenoid cystic carcinoma. Treatment was performed with LA after 3D planning. 70 Gy were administered at the level of primary tumor and 60 Gy in adjacent areas. He is free of clinical and radiological disease 48 months after treatment. After radiotherapy he never needed a tracheostomy.

Conclusions: When wild surgery is not possible, high doses of radiotherapy can provide long periods of remission.

ADJUVANT TREATMENT IN HIGH RISK ORAL CANCER

Torres, A.; Cabrera, J.; Corbacho, A.; Ruiz, A.; González, M.A.; Ríos, Y.; Quirós, J.; Ropero, F.; Muñoz, J.

Purpose: To analyze treatment outcomes of patients with oral cancer treated with radical surgery plus adjuvant radiotherapy (RT) or radiochemotherapy (RTC).

Material and methods: Retrospective analysis of a consecutive series of 125 patients with squamous cell carcinoma or oral cavity who underwent postoperative radiotherapy or radiochemotherapy between June 1997 and November 2013. Risk of recurrence was defined according to Langendijk et al criteria in multidisciplinary tumor board. Patients with R1 resection or Extra-Nodal Extension were treated with RTC, otherwise with RT.

Results: Median follow-up was 4.3 years (y) Mean Overall Survival was 8.6 y. Mean Cancer Specific Survival (CSS) was 12.4 y. Mean Disease Free Survival was 11.3 y. OS, CSS and DFS to 5-year and 10-year were 61% and 43%, 72% and 66%, 67% and 57%, respectively. On univariate analysis site or recurrence (SR) and number involved nodes (NIN) were associated with worse OS, CSS and DFS. On Multivariate analysis OS was worse according to SR HR=5.81 (95% IC: 3.57-9.45) and NIN HR=1.22 (95% IC: 1.05-1.4) Lower CSS was associated with SR HR=15.7 (95% IC: 6.88-35.87) Although any time variable related to treatment duration showed non-statistically differences in outcomes, median time to start treatment was 10 weeks. In this series 25% of patients developed second cancers, causing 10% of all deaths.

Conclusion: Site of recurrence and number of involved nodes are prognostics factor for survival. Second cancers are a significant issue for the surviving ones.

ADYUVANT TREATMENT AFTER TRANSORAL ROBOTIC SURGERY IN H&N CARCINOMAS

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Objectives and purposes: Present our center outcomes in patients with head and neck tumors treated with Transoral Robotic Surgery (TORS) followed by adjuvant radiotherapy (RT) or radiochemotherapy (RCT).

Material and methods: Between June 2013 and September 2014 analyzed 18 patients with a median age 63 years. 66.6% of tumors were in oropharynx (base of tongue 50% and tonsil 25%), 27.7% in supraglottic and 5% in hypopharynx. Histology was Epidermoid Carcinoma in 16 patients, 1 Non-Hodgkin Lymphoma and 1 Schwannoma. There was only 2 positive p16. All were operated by TORS and 14 with neck dissection. 83.4% had negative margins. Stages I-II were 22.2% and III-IV 66.6%. The RT was performed through IMRT and VMAT. The prescribed dose was between 54-66 Gy according to risk areas. QT based in CDDP every 21 days and 1 patient with cetuximab.

Results: 38.8% received adjuvant treatment and 61% didn´t receive it (63.6% RT and 36.4% RCT). Only 11% required gastrostomy after TORS and during treatment. The 25% of early stages and 83% of advanced stages received adjuvant treatment. There was a 18.1% G3 toxicity and 81.9% G1-2. Bed necrosis presented in 1 patient. Median total treatment time was 87 days. With a median follow-up of 5 months, 94.4% of patients were alive and free of disease.

Conclusions: TORS is a new oncologic surgical technique with preserving organ function and decreasing the total treatment time and toxicity. However, a larger number of patients, experience, follow up and p16 status are necessary to de-escalate the adjuvant treatment.

CAROTID-SPARING RADIOTHERAPY WITH VOLUMETRIC ARC THERAPY (VMAT) IN GLOTTIC LARYNX CANCER

Escolar Pérez, P.P.; Agüera Iglesias, A.; Gómez Aparicio, M.A.; Salinas Ramos, J.

Objectives: To compare the carotid dose with 3D-CRT and VMAT for early glottic larynx cancer treatment.

Materials and methods: Three patients were treated with 3D-CRT (parallel opposed beams) and three patients with VMAT (one or two arcs), including T1N0 and T2N0. At least 98% of the PTV receives 95% of the prescribed dose, which ranged between 63 Gy and 65.25 Gy delivered in daily 2.25 Gy fractions. During planning, the carotid mean dose was kept below 30 Gy for the VMAT technique.

Results: 3D-CRT vs VMAT dose volumen histograms parameters were: V30=96% vs 36%, V35=92% vs 12%, V40=82% vs 3%, V50=55% vs 1%, and V60=36% vs 0.03%. Dose to spinal cord was below 45 Gy for any of the treatment technique.

Conclusion: VMAT technique achieves a significant reduction of dose in the carotid arteries and consequently might reduce the vascular risk.

CAUSES OF DEATH IN LOCALLY ADVANCED HEAD AND NECK CANCER

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Objective: To analize causes of death in patients with Head and Neck cancer (HNCC) treated with different combinations of RT and QT or EGFR inhibitors. To explore factors associated with different causes of death.

Material and methods: Restrospective study of 89 patients with HNCC, stage III-IV, treated with different combinations of RT and QT or EGFR inhibitors (2000-2014).

Results: Of 89 patients (98% males, mean age 59, 47% stage III), 72% were treated with concurrent RTQT, 19% with induction QT followed by RT or RTQT, and 9% with RT-EGFR inhibitor. Charlson modified comoborbidity scale was: 0-1 (82%) and 2-3 (18%). With a mean follow up of 70 months, median OS and DFS were 69 and 43 months. 43% of the patients died: 62% due to tumour, 11% due to acute toxicity and 27% to other causes. Considering patients deaths related to acute toxicity, 75% were in patients treated with RTQT group, compared with 25% in other schemes ($p<0.05$). Moreover, most of the patients with non-tumoral causes of death (70%) had been treated with RTQT. Patients with a high comorbidity presented predominantly a cause of death different from cancer (71%), whereas in patients with low comorbidity the most important cause of death was cancer (72%) ($p<0.05$).

Conclusions: RTQT is associated to an increase of death as a result of acute toxicity. Moreover, RTQT is associated to a higher number of deaths of non tumoral, probably related to comorbidity. It is essential to explore new methods to select candidate patients for RTQT.

CERVICAL METASTASIS FROM CARCINOMA OF UNKNOWN ORIGIN: 10 YEARS EXPERIENCE

Martínez, J.; Hervás, A.; Vallejo, M. C; Ramos, A.

Purpose: Analyze the results of over 10 years experience in the management of patients diagnosed with cervical lymph node metastases from a squamous cell carcinoma of unknown origin.

Patients and methods: From October 2001 to April 2014, 22 patients were treated in our department. All patients received radiotherapy with curative or adjuvant intent based in this scheme: 50 Gy to clinical target volume including the areas of mucosa at risk depending on the affected nodal level and 66-70 Gy to areas with gross tumor or postsurgical region with extracapsular lymph node involvement with or without concomitant chemotherapy.

Results: Median age was 60 years (34-85), 77.3% male and 22.7% female. 22.7% of all patiens were stage III and 77.2% stage IV. Histological grade was G3 in 72.7% of cases and the cervical level most frequently affected was the level II (36.4%) followed by the joint involvement of levels II and III (31.8%). 19 patients (86.4%) were treated with surgery plus adjuvant radiotherapy and 3 with definitive radiotherapy, with or without concomitant chemotherapy. The concomitant chemotherapy used was weekly cisplatin at 40 mg/m^2 in 88.88% of patients that received chemo. No primary tumor appeared afterwards in any case. Median follow-up was 32.5 months (6-103). Two-year and five-year overall survival, cause-especific survival and disease-free survival were 78% and 68%, 90% and 86.36%, 86.36% and 86.36%, respectively.

Conclusions: In our series, the radiotherapy in cervical lymph node metastases from a squamous cell carcinoma of unknown origin offers a good toxicity profile and results comparable with literature.

CHOROIDAL MELANOMA: STEREOTACTIC RADIOSURGERY EXPERIENCE AND RESULTS

Larrea, L.; López, E.; Antonini, P.; González, V.; Baños, M.C.; Bea, J.

Objective: Evaluate local control rate, enucleation-free survival and radio-induced toxicities in patients with choroidal melanoma treated with stereotactic radiosurgery (SRS).

Materials and methods: Between 2003 and 2014, 5 patients with localized choroidal melanoma were treated in our institution. Mean age was 60 years (43-79). According to Collaborative Ocular Melanoma Study Classification the size of the lesions was: small in 60%, medium in 20% and large in 20%. Mean tumor volume was 0.53 cm^3 (0.17-0.93). Previous to SRS the visual function was: complete hemianopsia (1 patient), conserved visual acuity (1 patient) and unknown in 3 patients. Eye muscles were fixed to Leksell Frame under deep sedation and retrobulbar blockage. Magnetic resonance (MRI) and computed tomography (CT) were performed to contour lesion. Simuplan® planning system was used. A single 30 Gy fraction was delivered using linear accelerator with cone collimation. Prescription covers the 80% isodose in 4 patients and the 60% isodose in 1 case.

Results: Median follow-up was 36 months (4-180). MRI response was complete in 20% and partial in 80%. Mean maximum doses were 13.63 Gy in lens and 25.87 Gy in optic nerve. No local or distant recurrences have been detected. Enucleation has not been necessary in any case. Five years after radiosurgery one patient presented asymptomatic retinal scarring. No other radiation-induced toxicities were observed.

Conclusion: SRS is a minimally invasive, safe and effective alternative to brachytherapy and enucleation in choroidal melanoma with high local control rates and low incidence of radio-induced toxicities.

CONJUNCTIVAL-CORNEAL INTRAEPITHELIAL NEOPLASIA (BOWEN DISEASE) TREATED WHITH ORTHOVOLTAGE

García, M. E.; Fuentes, C.; Sánchez, J. L.; Villamil, S.; Rubio, C.G.; Salinas, A.; Martín, J.J.; Hernández, R.; Armijo, A.; Borque, C.

Objective and purpose: Conjunctival-corneal intraepithelial carcinoma (Bowen disease) is the third most common tumor of the ocular surface. The management includes resection and topical treatment (cryotherapy, interferon). There are few papers about the treatment with irradiation in this disease. The total doses and fractionation are unknown. We report our experience with five patients.

Material and methods: Between February 2010 and September 2014 five patients were referred to our department. The average age is 65 years, two women and three men. Four patients received irradiation with Orthovoltage (80 KV), using a direct shaped field. The total dose was 50 Gy, with 3 Gy/fraction up to 30 Gy plus 20 Gy, 5 Gy/fraction (twice a week) in three of these patients. One patient received 45 Gy, 3 Gy/fraction. The fifth patient had orbit and bulbar conjunctiva involvement and was

treated with direct field of photons and electrons (50 Gy, 2 Gy/fraction). The biological effective dose was between 58 Gy and 70 Gy with alpha/beta 10, in all cases.

Results: All patients were in complete remission at the end of the treatment. No relapse has been seen (3-60 months) or late toxicity. Mild conjunctivitis was observed in one patient.

Conclusions: There are no recommendations in the literature about treatment of this tumor with Orthovoltage (only one publication). Treatment with Orthovoltage seems to be effective and safe and can be an alternative to surgery specially in big tumours. Lower doses might be also effective.

DELAY IN HELP SEEKING FOR HEAD- NECK CANCER "ALARM" SYMPTOMS

Gutiérrez Bayard, L.; Salas Buzón, M.C.; de Ingunza Barón, L.; Villanego Beltrán, I.; Gonzalez Calvo, E.; Díaz Díaz, V.; Díaz Gómez, L.

Purpose: Delay in help seeking for cancer 'alarm' symptoms has been identified as contributor to delayed diagnosis. Understand people's help-seeking decision making for head and neck cancer alarm symptoms, without imposing a cancer context. Method Community-based, qualitative interview study in otolaryngology consultation, using purposive sampling by sex, socioeconomic status, and prior help seeking, with framework analysis of transcripts. Interviewees (n=51) were recruited from community-based sample (n=224) of adults aged ≥35 years who completed a health survey (included list of persistent symptoms (cough or hoarseness, unexplained pain, difficulty swallowing, unexplained: lump, non-healing sore, bleeding, weight loss)). Cancer wasn´t mentioned. Participants reporting any of 7 cancer alarm symptoms (n=193) and who´d consented to contact (n=98) formed potential pool from which people were invited to interview focusing on their symptom experiences. Results Reasons for help seeking included symptom persistence, social influence, awareness/fear of a link with cancer, 'just instinct'. Perceiving symptom as trivial or 'normal'was a deterrent, adopting self-management strategies, and fear of investigations. Negative attitudes to help seeking were common. Participants didn´t want to be seen as making a fuss, didn´t want to waste the doctor's time, and were sometimes not confident that General Practioner could help. Conclusion Decision making about cancer alarm symptoms was complex. Recognition of cancer risk almost always motivated help seeking (more so than the fear of cancer being a deterrent), assisted by public-awareness campaigns. As well as symptom persistence motivating help seeking, it could have reverse effect.

EFFECTIVENESS OF PALEXIA® IN CONTROLLING MIXED PAIN AFTER NECK SURGERY

Arregui López, E.; Sanz Martín, M.M.; Lozaqno Martín, E.; Ríos Asus, P.; Morera López, R.

Introduction: All operable locally advanced larynx tumors require a radical neck dissection. Often these patients have a mixed pain as a sequel. Palexia® (Tapentadol) is a centrally acting analgesic of a new substance class for the treatment of severe nociceptive and neuropathic pain.

Objectives: We wanted to assess the effectiveness of Palexia® in these patients.

Material and methods: The subjects of this study were 30 patients with accessory nerve palsy. The median follow up was 15 months. Every patient received treatment with Palexia® and underwent evaluations through the analysis of EVA measuring, the need for adjuvant drugs and response to rehabilitation. Furthermore, we measured the required dose of Tapentadol to maintain analgesia controlling the potential toxicity over time.

Results: We collected data showed that 84% of patients interviewed, EVA had between 8 and 10. After a month of treatment with Palexia®, EVA decreased in these patients was observed in 100% of patients, reaching 92% a score ≤3 on the scale. Sixty percent of patients required an adjuvant drug as Pregabalin (75 mg/12 hours) for further mitigate neuropathic pain. Of the patients studied, there were only three who needed additional rehabilitation sessions (median 4 sessions), after administration of Palexia®. We were able to maintain 96% of patients treated with a small dose of Palexia® (50 mg/12 hours) chronically without any adverse effects.

Conclusions: Low doses of Palexia® significantly improved patient mixed pain in all movements in more than one year follow up, needing half times the support of an adjuvant drug.

EFFICACY OF A MELATONIN GEL IN PREVENTING GUT MUCOSITIS

Fernández-Gil, B. I.; Guerra-Librero, A.; Shen, Y Q.; García-López, S.; López, L.C.; Acuña-Castroviejo, D.; Escames, G.

Aims: We previously reported a new pharmaceutical formulation of melatonin gel able to prevent oral mucositis induced by irradiation, and we identified that mitochondrial dysfunction underlies the pathogenesis of radiation-induced oral mucositis. Thus, this new pharmaceutical formulation of topic melatonin application has an important clinical interest. The objective of this study was to analyze whether this melatonin gel is also able to prevent radiation-induced toxicity in the intestine.

Materials and methods: Male Wistar rats were subjected to irradiation, and their duodenum were obtained for subsequent determinations. The radiation was administered using a Ray-X YXLON Y.Tu 320-D03 irradiator, and the rats received a dose of 7.5 Gy/day for 5 days in their oral cavity. Rats were treated with 45 mg/day melatonin gel or vehicle during 21 days post-radiation, by application in their mouths. Inflammatory reaction was determined measuring NF-kB, NLRP3, ASC, caspase-1, and proinflammatory cytokines expression. Apoptosis studies were also performed through the quantification of pro- and anti-apoptotic proteins. Finally, macro and microscopy damage was evaluated by histology and electron microscopy. Pharmaceutical preparation of melatonin in gel is currently under patent.

Results: A typical radiation-induced intestinal mucositis was macroscopically observed, which was absolutely prevented by melatonin gel treatment. Mitochondria were impaired after radiation, losing their bioenergetic capacity and structure, whereas melatonin gel restored mitochondrial function, increasing the activity of the mitochondrial antioxidant enzymes. Irradiation resulted in duodenal inflammatory damage with a significant increase in the expression of NF-κB and NLRP3. Irradiation also induced apoptosis, increasing the Bax/Bcl2 ratio. Melatonin decreases the expression of NF-κB, iNOS/i-mtNOS, NLRP3, caspase-1, and proinflammatory cytokines. The administration of melatonin gel was highly effective against radiation-induced intestinal toxicity.

Conclusions: Considering the low toxicity of melatonin even during long term administration, which makes possible its clinical use, our results provide evidence for the therapeutic value of melatonin to prevent mucositis in cancer patients under irradiation.

FDG-PET/CT IN UNKNOWN ORIGIN CARCINOMA WITH INVOLVED CERVICAL LYMPH NODES

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Objective: To evaluate the usefulness of FDG-PET/CT in detection of unknown primary tumor localized in head and neck area.

Material and methods: 25 patients presenting with cervical lymph nodes positive for carcinoma of unknown origin were included (age: mean 58 years, histology: 22 squamous, 2 undifferentiated, 1 adenocarcinoma). All underwent H&N-CT and endoscopy without detection of lesions suspicious to be the primary tumor. Later were referred for FDG-PET/CT.

Results: PET-CT detected the primary tumor in 14 patients (56%). 12 of them in H&N region (7 base of tongue, 2 tonsil, 1 nasopharynx, 2 pyriform sinus) and 2 of them in other areas (prostate and lung). In 11 patients (44%) was not detected any suspicious lesion. 10 of them had negative blind biopsies and 1 positive in right lateral wall of the hypopharynx. Bone and lung metastasis were detected in 2 patients, supraclavicular lymph node involvement in 6, and distant lymph node involvement in 4. One patient with undifferentiated carcinoma proved to be an anaplastic lymphoma on final histological diagnosis after neck dissection.

Conclusion: FDG-PET/CT demonstrated a good ability to detect the primary tumor in the H&N area in 56% of patients in unknown origin carcinoma with involved cervical lymph nodes as first onset.

FENTANYL PECTIN NASAL SPRAY (FPNS) IN PAINFUL DYSPHAGIA INDUCED BY RADIOTHERAPY

Bueno Serrano, C.M.; Espinosa Calvo, M.; García Cabezas, S.; Romero Ruperto, F.; Palacios Eito, A.

Objectives: To evaluate pain improvement in a retrospective series of neck cancer patients treated with FPNS before swallowing. To assess the minimum effective dose of FPNS needed to improve painful dysphagia in patients with head and neck cancer who are treated with radiotherapy.

Material and methods: Patients with head and neck cancer treated with curative or postoperative radiotherapy were considered. 20 patients included. Primary tumor site: Oropharynx=6, Oral cavity=5, Nasopharynx=1, Larynx=8. Radiotherapy median dose 70 Gy (60-70 Gy). Patients were considered if receiving basal antalgic therapy with opioids (25-50 mg transdermal fentanyl equivalent dose). When the patients reported painful dysphagia, they started FPNS before eating or drinking Initial treatment dose=100 µg, with titration phase until effective dose.

Results: Patients reached a good pain control with FPNS. Only one patient abandoned treatment by choice. In 12 patients (60%) did not take up the originally scheduled because with 100 µg dose reached a good pain control. In 5 patients (25%) had to increase the dose to 200 µg and only 2 patients (10%) required to reach 400 µg.

Conclusions: FPNS demonstrated activity against painful dysphagia in patients with head and neck cancer who are treated with radiotherapy. The initial dose of 100 µg may be sufficient to achieve good pain control during intake.

FUNCTIONAL ORGAN PRESERVATION FOR LARYNX CANCER

Berenguer Francés, M.; Lafaurie Acevedo, A.M.; Tormo Ferrero, V.; Cardenal Macia, R.; Andreu Martínez, F.J.

Purpose: Spain incidence of larynx cancer was 3.182 new cases annually per 100.000 in 2012. Functional organ preservation is widely recommended and generally utilizes a combination of chemotherapy plus radiation therapy (RT). Objective is compare overall survival and disease-free survival among patients diagnosed with laryngeal cancer who received conservative treatment versus treated with laryngectomy.

Methods and materials: Retrospective analysis of a database of all patients that were diagnosed with laryngeal cancer between 1st January 2005 and 30th December 2013. This patients were registered in the head-neck committee from Sant Joan d'Alacant Hospital.

Results: The size of the final sample consisted of 61 patients with laryngeal carcinoma out of which 37 suffered organ-preservering approaches and 24 were treated with laryngectomy plus adjuvant radiotherapy. Median follow-up time was 36.43 months (rank 2-97). Descriptive data for disease control were 42 (68.9%), 5 (8.2%), 4 (6.6%), 3 (4.9%) and 7 patients (11.5%), had not recurrence, local, regional, distance and loco-regional-distance recurrence, respectively. Overall survival probabilities at 5 years were 51 and 61.8 percent (p=0.482) and 5-year progression-free survival probabilities were 59.2 and 70.2 percent (p=0.814) for the organ-preserving treatment and for laryngectomy, respectively.

Discussion: Organ preservation treatments for laryngeal cancer with chemotherapy and RT present rates of overall survival and disease-free survival similar. This treatment doesn't provide a survival advantage over total laryngectomy, but they might offer a functional benefit for the patient to the speech and swallowing. Our results are similar to those obtained in the current scientific literature.

HEAD AND NECK TUMORS RADIOTHERAPY: CLINICAL CONTROL AND THERAPEUTIC COMPLIANCE

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Objectives and purposes: Radiotherapy in head and neck tumours generate a significant toxicity requiring strict clinical control with the proper use of analgesia and nursing care to optimize the duration of treatment. Our objective is to assess the degree of mucositis, use of analgesia and the impact in the duration of the radiotherapic treatment in our patients.

Material and methods: Between September 2007 and December 2012, 225 patients with head and neck tumours received radical treatment. 87% were males. The mean age was 62 (16-88). 68% (153 cases) were advanced stages (III and IV). In terms of treatment, 26% received radical radiotherapy, 45% chemoradiation, 16% were treated with adjuvant radiotherapy after surgery, and 12% with adjuvant chemoradiation. We registered the degree of mucositis, the use of analgesia during radiation therapy and the duration of the treatment.

Results: The incidence of G1, G2 and G3 mucositis was 12%, 66% and 22% respectively. The use of analgesia of first, second and third step was 37%, 4% and 49% respectively. 10% of patients not required regular analgesia. Only 13% of patients required PEG to complete the treatment. The average treatment time was 46.7 days (28-72). Only 8% of patients took more than 8 weeks to finish the radiotherapy and 70% finished in 7 weeks or less.

Conclusion: With proper care during the radiotherapy and an adequate analgesic control, we can get a good therapeutic compliance in terms of time without interruptions due to toxicity.

HELICAL TOMOTHERAPY VERSUS VMAT FOR HEAD AND NECK CANCER PATIENTS

Matskou, K.; García Ledesma, J.; Martín Rincón, C.; Pérez Romasanta, L.A.

Purpose: Two IMRT techniques for Head and Neck patient treatments are used in our department: Helical Tomotherapy (HT) and Volumetric Modulated Arc Therapy (VMAT). Routinely the criteria for choosing the technique are not clearly defined or depends on the waiting list and the machine treatment capacity. Here, we evaluate both treatment modalities in terms of dosimetric parameters for target volumes, organs at risk (OAR) and machine performance data.

Material and methods: We analyzed treatment plans of 7 H&N patients, performed on Eclipse® planning module for VMAT and on TomoTherapy® planning station for HT. The planning goal was to deliver 95%of the prescribed isodose to whole PTV. Treatment plans were evaluated using our department protocols. The parameters used for the analysis were: homogeneity index(HI), medium homogeneity index(mHI) and conformal number(CN), which were calculated for the high dose PTV. Also, we evaluated the OAR dosimetry, monitor units per fraction (MUfx) and beam on time. For statistic comparison the Wilcoxon test was used.

Results: The median of the PTV dosimetric parameters were similar in both techniques:HI 0.068 vs. 0.067 (p=0.46), mHI 0.950 vs. 0.958 (p=0.14), and CN 0.64 vs. 0.659 (p=0.46) for VMAT and HT respectively. Dmax for spinal cord was 37.02 Gy vs. 38.85 Gy (p=0.46), contralateral parotid (CP) V15 were 63.63% vs. 49% (p=0.28), and CP V30 were 31.86% vs. 17.5% (p=0.65) for VMAT and HT respectively. The median MUfx were 503 vs. 4600 (p=0.068), beam on time 180 vs.289 seconds for VMAT and HT respectively.

Conclusion: These two techniques are similar in PTV and OAR dosimetric endpoints. Less beam on time and monitor units per fraction for VMAT were observed.

HYPERFRACTIONATED RADIOTHERAPY WITH CHEMOIMMUNOTHERAPY IN LOCOREGIONALLY ADVANCED HEAD-NECK CARCINOMA (HNSCC)

Carmona-Vigo, R.; Blanco, J.M.; Cabrera, R.; Lloret, M.; Rivero, J.; Quintero, S.; Moreno, M.; Lara, P.C.

Purpose and objective: The aim of the present study is to analyze clinical outcomes and toxicity in patients with HNSCC treated with concurrent hyperfractionated radiotherapy with Cetuximab and Carboplatin.

Material and methods: Forty-one patients (8 cases ST.III and 33 cases ST.IV) were prospectively included in this study from September 2009 to November 2014. Radiotherapy consisted in hyperfractionated radiotherapy: 1.15-1.20 Gy/fraction, BID, 5 days/week during 7 weeks. The average dose administered was 80.2 Gy (79.2-80.5). Carboplatin was administered 5 mg/m^2 before each fraction of radiotherapy. Cetuximab was administered 400 mg/m^2 one week before hyperfractionated radiotherapy and then 250 mg/m^2 weekly while radiotherapy. Seven patients were not evaluable for response (in 3 patients, Capecitabine was added to the treatment; in 1 patient nodal metastases came from a papillary thyroid carcinoma; 3 patients were not evaluable for response because 2 patients died within 30 days after treatment and 1 patient has not enough follow-up to be evaluated for response).

Results: All but 2 of the 34 evaluable patients showed objective response (19 complete responses). The local relapse-free survival, cause specific survival, and overall survival was 58.7%, 57%, 49% at 5 years, respectively. Severe (Grade II/III) acneiform rash resulted predictive of Clinical Response (p=0.005), Local relapse (p=0.008), distant metastases (p=0.012) and tumour related dead free survival (p<0.0001). Severe (Grade III) acute cutaneous and mucosal toxicity was present in almost 60% of the cases.

Conclusions: This protocol induces a high rate of clinical responses and excellent survival figures in patients developing a strong immune response after combined radio-chemoimmunotherapy.

HYPOFRACTIONATED PALLIATIVE RADIOTHERAPY FOR LOCALLY ADVANCED HEAD AND NECK CANCER

De la Rúa Calderón, M.A.; Alonso Pantiga, J.R.; Alonso Sánchez, D.; Cucarella Beltrán, P.; Orduz Arenas, C.

Objective: To perform a retrospective study about tolerance and survival in patients diagnosed with locally advanced head and neck cancer (LAHNC) treated with palliative radiotherapy.

Material and methods: 42 patients diagnosed with LAHNC were included. Treatment with curative intent was no possible due to advanced age, poor general status, social problems or associated pathologies. They were treated by weekly hypofractionated radiotherapy to relieve local symptoms.Statistics analysis was estimated with the Kaplan-Meier method.

Results: Most were male (38 patients). Median age: 76.5 years. Karnofsky median: 70%. 19% were located in the oral cavity, 2.4% in facial massif, 33.3% in the oropharynx, 21.4% in hypopharynx, 16.7% in larynx, 2.4% in glands salivary, 2.4% of unknown primary and 2.4% in thyroid. The total external beam radiotherapy dose ranged between 6 and 48 Gy. The acute toxicity and the cause of death was analyzed. Overall survival at 5 years was 4.8%, mean: 11.5 months, median: 6 months. Local control was 12.4% at 5 years, mean: 11.9 months, median 1 month. Cervical control was 35.6% at 5 years, mean: 29.6 months, median 7 months. Overall survival at 5 years in patients with no lymph nodes was 16.7%, mean: 26 months. For the group of patients with lymph nodes the overall survival at 5 years was 0%, mean: 5.8 months. Comparison between both groups was statistically significant (p=0.002).

Conclusions: Treatment with weekly hypofractionated palliative radiotherapy can prolong free disease and overall survival for a few months with an acceptable quality of life.

IMRT FOR LOCALLY ADVANCED HEAD AND NECK CANCER. INSTITUTIONAL EXPERIENCE

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Purpose: To evaluate the results of using intensity modulated radiotherapy with simultaneously integrated boost (SIB-IMRT) technique in locally advanced head and neck tumors with 48 months median follow-up.

Material and methods: Our study included 211 patients treated during May 2007 - February 2012. Patients were immobilized with customized thermoplastic masks for head and shoulders. High risk PTV received 69.96 Gy (2.12 Gy/fraction), intermediate risk PTV-59.40 Gy (1.80 Gy/fraction) and low risk PTV-54.12 Gy (1.64 Gy/fraction). The postoperative dose was 66 Gy (2 Gy/fraction). Primary tumor location: Oropharynx 23.1%, Hypopharynx 12.7%, Larynx 30.6%, Nasopharynx 16.5%, Oral cavity 15.1%, Multifocal 1.9%. In our study 37.7% of patients received postoperative radiotherapy ± chemotherapy, 62.3% received radical treatment (33.3% of them were treated with neoadjuvant platinum based chemotherapy).

Results: The frequency of acute mucositis G0-I was 11.4%, GII-57%, GIII-23%; of acute dermatitis G0-I-29%, GII-37%, GIII-9%.

Only 13% of patients suffered treatment interruption. Chronic xerostomia GII-III was diagnosed in 13% of patients. Two and three-years overall survival for all tumor sites was 68% and 62% respectively. Four percent of patients needed replanning due to weight loss or morphological changes. Despite the low number of reirradiated patients (8), the median survival in this group was 15 months.

Conclusions: Our results demonstrate that IMRT provides a high level of critical organ preservation, with moderate toxicity and acceptable survival results, which are comparable to those published in the literature. IMRT allows reirradiation as a salvage therapy.

IMRT HEAD-NECK CANCER: VERIFICATION AND MARGIN CTV-PTV CORRECTION PROTOCOLS

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Purpose: PTV (planning target volume) is defined to ensure prescribed dose delivered to CTV (clinical target volume). To improve accuracy and reproducible IMRT delivery is important to know, measure and minimize systematic and random errors present in our department. We analyzed them, head and neck cancer IMRT to provide basis for calculating margin between CTV-PTV, in two periods (first year implement IMRT, two years later).

Material and methods: We use treatment verification to detect delivery errors, and assess suitability of margins´ size planned around CTV, analyzing our uncertainties (radiotherapy process). For each patient, in four first sessions, use cone beam (cbct) imaged-guided radiotherapy (on-line verification). The fifth session following NAL protocol (No Action Level), we apply the mean. Every five sessions repeat cbct, if displacement is greater than 3 mm, repeat cbct three consecutive days, calculated new mean. We measure random/systematic errors calculating margin around CTV, using Van Herk method (VHM) ($2.5\ \Sigma + 0.7\ \sigma$).

Results: We analyzed collected displacement first/second period respectively in 21/53 patients based on cbct verification (millimeter). Standard deviation of random error set-up: vertical: 1.56/1.47; longitudinal: 2.01/1.86; lateral: 1.29/1.22. Systematic set-up error: vertical: 2.02/1.97; longitudinal: 1.81/1.72, lateral: 2.40/2.17. Following NAL protocol, to asses and correct systematic set-up error obtain new tolerance values: vertical: 3/2.8; longitudinal: 2.6/2.45, lateral: 4/3.93. Finally, established PTV margin following VHM: vertical: 6.14/5.89, longitudinal: 5.94/5.89, lateral: 6.92/6.84.

Conclusion: Calculated individual and population-based measures to address random and systematic errors allow being certain of treating our patients with minimum margin required, without missing target.

INFLUENCE OF RT TECHNIQUE (3D-RT VS IMRT) AND HPV STATUS IN LOCALLY ADVANCED OROPHARYNGEAL CANCER

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Purpose: To evaluate our institution´s experience in locorregional control (LRC) and overall survival with IMRT and 3D-RT in the treatment of patients with Oropharyngeal Cancer. We also evaluated the influence of HPV in the prognosis.

Materials and methods: We retrospectively analysed 56 patients (40 M and 16 W) with ages between 34 and 93 years, with oropharyngeal cancer treated with 3D-RT or IMRT at our institution between Jan. 1996 and Jan. 2015. Patients in the study were concomitantly treated with chemotherapy based in cisplatin. A HPV test was requested for 38 of the patients. A overall survival (OS) study together with LRC and distance control was performed and evaluated at 3 and 5 years depending on the radiotherapy technique and on the HPV results.

Results: 25 patients were treated with 3D-RT and 31 with IMRT. HPV test was positive in 16 patients (42.1%) and negative in 22 patients (57.8%) out of the 38 patients tested. RT dose prescribed at the GTV was between 64.8 and 76 Gy in fractions of 1.8-2.2 Gy each. The minimal dose in effective volumes was 54-64 Gy administered in 1.6-1.8 Gy fractions. The follow-up for survival was between 1.4-187.6 m, with a median of 31.7 m. The LRC median was 17.3 m (min 2-max 187 m). Evaluated at 3 and 5 years LRC was 56% for the group treated with 3D-RT and 69% for the group treated with IMRT. OS median value was 31.7 months (min 1.4-max 187). Evaluated at 3 and 5 years OS 56.4% for the group treated with 3D-RT and 69% for the group treated with IMRT. Related to the HPV OS at 3 and 5 years was 55.6% for the negative group and 70.7% for the positive group.

Conclusions: The treatment with IMRT provided a slightly higher OS rate at 3 and 5 years compared to 3D-RT in patients with oropharyngeal cancer, however the difference was not statistically significant. There was a higher survival rate in HPV positive patients although the difference was not statistically significant.

INITIAL CLINICAL CRITERIA, PLATFORM AND STAGES OF COMPLETION OF ADAPTED RADIOTHERAPY AT HOSPITAL LA PAZ

Glaría Enríquez, L.A.; Huerga Cabrerizo, C.; Castaño, A.L.; Huerta, C.; Corredoeira, E.: Escribano, A.; Reyes, J.A.; Ferrer, C.

During radiotherapy treatment patients experience changes in their anatomy. These changes stem from variations in body weight or body fat distribution and variations in tumor volume when this volume affects the visible or radiological anatomical landmarks influencing daily positioning of patients. The anatomical variations experienced by patients during treatment may change the dose distribution, diverting the fulfillment of the initially posed dosimetric/clinical objectives. These deviations may compromise the effectiveness of treatment and cause adverse events[1]. We describe the initial approach that we have established for the correction of these deviations based on adapting the initial radiotherapy treatment. The process is based on warning and detection of anatomical deviation criteria, with a decision algorithm established in an indicative way[2]. The alert for deciding to start a process of adaptation of radiotherapy plan part of the image control positioning (ideally volumetric but not limited to) followed by a rapid decision making for a new CT planning with a new immobilization. By using a tool for fusion (rigid and non-rigid, Velocity, Elekta) fusion of the new CT with the original is performed, including changing contours to adjust the initial volumes approach to new anatomical data. This new CT with contours is transferred to the regular contouring program (Focal) and the fusion adequacy is evaluated by radiophysics and oncology. The validation of deformable records is an important part of the process[3]. Oncologist conduct verification and correction of the adapted volumes[4]. The adapted volumes correction is based in coverage safety criteria. Once the new dosimetry is approved R adiophysics performs replanning process and quality control. Clinical aspects of the process are described here through 4 cases.

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INITIAL GLOTTIS-CANCER TREATED WITH RADICAL RADIOTHERAPY: OUTCOMES AND QUALITY OF VOICE-LIFE

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Objective and purpose: Prospectively analyze the oncological outcomes and quality of voice-life of patients diagnosed with early glottic cancer treated with radical radiotherapy exclusive.

Material and methods: 23 patients diagnosed with squamous cancer stages T1-T2 treated with radiotherapy alone. The monitoring was conducted before starting radiotherapy and at three, six and twelve months after finishing. We have performanced an evaluation of the oncological results by complete examination and analysis of toxicity according to the Common Terminology Criteria for Adverse Events. Functional outcomes voice quality studied by perceptual evaluation according GIRBAS scale; aerodynamic and acoustic study digital analysis using the Acoustic Voice Quality.

Results: Recurrences: tracking the range between 28 and 14 months has appreciated recurrence 5/23=21.7%; (T1: 3/17=17.6%; T2: 2/6=33.3%). Toxicity: After three months of the radiotherapy the most consistent symptom was dysphagia, reaching grade 2 in almost half of the sample. The vocal cord edema was the most common finding in videostroboscopy and only in one patient conditioned tracheostomy. Voice Quality: The perceptual analysis showed high correlation with the results of digital voice analysis as quantitative parameter AVQI. Quality of life: pre-treatment scored a value of 34 to 90, falling after treatment.

Discussion and conclusion: This serie is small for an analysis of variables involved in recurrences. This is an easily reproducible and objective protocol, that allows multicenter studies in the future. Our results show good voice-life quality.

INTRANASAL FENTANYL SPRAY AND ODINODYSPHAGIA IN HEAD AND NECK CANCER

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Objective and results: Odinodysphagia is a common side effect from radiotherapy treatment. Intranasal fentanyl spray (IFS) is usually prescribed for breakthrough pain that is defined as a transitory flare of pain in the setting of chronic pain managed with opioid drugs. However, some patients can suffer an intense odinodysphagia without baseline pain. In this way, the objective of our study is to review the safety and efficacy of IFS for odinodysphagia management without baseline pain.

Material and methods: We reviewed patients diagnosed with head and neck cancer who consulted for odinodysphagia without baseline pain. These patients were treated with IFS (PecFent®) 10 minutes before swallow. The patients started with dose of 100 µg and only one inhalation, if the pain control was not achieved, they could to increase to 2 inhalations before swallowing. The dose of IFS was increased to 400 µg if 2 inhalations were not enough to relieve the pain.

Results: We found 4 patients who met the requirements. Visual Analogue Scale (VAS) was 7 in 3 patients and 6 in another one. All patients achieve pain control after IFS treatment (drop of VAS until 3 points), in fact, 2 patients didn´t need others opioid drugs. All patients used 200 µg or less to control the pain. The time between IFS and fentanyl transdermal patch was 9 and 13 days for the others two patients. Dizziness was the only side effect registered.

Conclusion: IFS is an effective and safe treatment for odinodysphagia in patients without baseline pain.

INVERTED PAPILLOMA ASSOCIATED TO NASAL CAVITY SQUAMOUS CANCER

Nieto Regueira, I.; Trillanes, A.; Núñez, A.

Introduction: The Schneiderian papilloma is a benign tumor derived from sinonasal pseudostratified columnar epithelium originated from ectodermal sneiderian membrane. It´s a rare tumor (0.5-4% of nasal tumors), unilateral, and it frecuently relapses. Mean age of onset 50 years. Male/female ratio: 4/1. Symptoms: Runny nose (90%) nasal obstruction (90%) nasal deformity (45%) Etiology: unknown. HPV PCR (6, 11, 16, 18 and 57) is detected in 10% and EBV. There´s no association with tobacco neither chemical or environmental substances. Classification based on histology: Endophytic or inverted (80%) or exophytic (15%) Oncocytic (5%). Location: Side Wall. Aggressive local behavior, leading to infiltrate soft tissues, oral cavity through the palate and orbit. Krouse classification according to their size and extent: Stage I to IV. The treatment of choice is surgery, which should be complete and free margins must be obtained as they are tumors that have a high rate of local recurrence (25-50%). It could be associated with squamous cancer.

Methods and materials: Between may 2013 and december 2314 we treat two 44 and 38 years-old female patients, diagnosed with nasal cavity and ethmoid sinus squamous cell carcinoma associated with inverted papilloma. Stages pT3 by affecting the palate and pT4b by involvement of the dura, respectively, postoperative situation. Both patients received adjuvant treatment with IMRT, radical doses: The PTV1 encompasssed the nasal cavity and paranasal sinuses and cervical lymph node chains, received 55 Gy, 1.7 Gy per fraction. A portion of the anterior cranial fossa was included in the second patient. The PTV2, encompassing the surgical bed, received 69 Gy to 2.16 Gy/fraction, in 32 fractions, 5 days a week. The first patient received weekly ciplatin.

Results: Both patients completed the RT treatment with acceptable side effects: Local pain, dysgeusia, sore throat and nasal dryness. At the present day, both patients are in complete remission. Follow-up time is short in both cases.

Conclusions: Inverted papilloma is a benign neoplams but with a locally aggressive and invasive behavior. Being a rare tumor is very difficult to design statistically significant trials Reviewing the literature, inverted papilloma (p16 positive, overexpression of p53) could be associated with squamous cancer. (10-20%). The role of adjuvant radiotherapy in the treatment of Schneiderian papilloma is unclear. We recommended adjuvant radiotherapy in these situations: Possitive surgical margins, mutilating surgery and squamous cell carcinoma associated.

IS PET/CT NECESSARY FOR STAGING HEAD AND NECK CARCINOMA?

Cacicedo, J.; Fernandez, I.; del Hoyo, O.; Dolado, A.; Hortelano, E.; Casquero, F.; Gomez-Iturriaga, A.; Perez, F.; Ortiz de Zárate, R.; Bilbao, P.

Purpose: To determine the incremental staging information provided by PET/CT and its impact in changing initial management plan in patients with untreated stage III-IV head and neck carcinoma (HNSCC).

Methods: 84 consecutive patients with histologically confirmed HNSCC were prospectively recruited. First, the TNM stage and treatment plan for each patient was documented based on the conventional work-up (physical examination, CT imaging of the head and neck and thoracic region). Management plan outlined the modalities planned such as surgery, radiation (RT), chemotherapy, or a combination. After the release of the PET/CT results, a second TNM and management plan was recorded. TNM stage was validated by histopathology, additional imaging, or follow-up. The impact on patient management was classified: low (treatment modality and delivery unchanged), medium (change within the same treatment modality: type of surgery, radiation technique/dose), high (change in treatment intent and/or treatment modality → curative to palliation, surgery to chemo-radiation or detection of unknown primary tumor or a synchronous second primary tumor). Conventional and PET/CT stages were compared using the McNemar test.

Results: Conventional and PET/CT stages were discordant in 32/84 (38%) cases (2/32 patients (6.2%) in T stage, 21/32 patients (65.7%) in N stage. and 9/32 patients (28.1%) in M stage). Patient management was altered in 22/84 (26%) patients (medium impact in 8 (9.5%) patients and high impact in 14 (16.6%) patients). PET/CT TNM classification was significantly more accurate (71.4% vs 25%) than conventional classification (p=0.021).

Conclusion: PET/CT should be implemented in the routine imaging work-up of stage III-IV HNSCC.

LARYNX PRESERVATION IN PATIENTS WITH LARYNX AND HYPOPHARYNX SQUAMOUS CARCINOMA

Cucarella Beltran, P.; Alonso Pantiga, R.; De la Rua Calderon, M.A.

Background: To present protocol larynx preservation results in patients treated for carcinoma of the larynx or hypopharynx in stage III and IV.

Material and methods: Data from a serie of 50 patients treated between 2007-2012 (minimum three years follow-up) under the guidance of larynx preservation protocol were analyzed. Treatment protocol is divided into two phases. Patients meeting the inclusion criteria receive CDDP and 5FU cycle. At 3 weeks CT evaluation is performed. If the response is >50% are included in the arm chemoradiotherapy: CDDP every 3 weeks and RT 70 Gy 2 Gy per session 5 days a week. Those who do not respond or <50% are scheduled to total laryngectomy + neck dissection. If indicated received postoperative RT.

Results: The serie includes 50 patients with a median age of 56 years. 42 men and 8 women with tumors in the larynx (28) and hypopharynx (22). Twenty-two not reached a sufficient response (<50%), performing laryngectomy in 19 patients (3 refused), and 27 responders received CRT; 6 LT for recurrences were performed. So larynx preservation was achieved in 50% of all patients. The survival of the entire group was 51% at 5 years and 62.6% cause-specific survival. The specific survival at 5 years with CRT was 60% compared to 65% of total laryngectomy gupo (p=0.568).

Conclusions: The larynx preservation protocol achieves the same survival rates that total laryngectomy, contributing 50% of preservation of organ function.

LOCALLY ADVANCED CARCINOMA OF MAXILLARY SINUS. TREATMENT RT + QT

De la Rúa Calderón, M.A.; Alonso Pantiga, J.R.; Alonso Sánchez, D.; Cucarella Beltrán, P.; Orduz Arenas, C.

Objectives: To report 3 cases of locally advanced carcinoma of the maxillary sinus (LACMS) treated with chemotherapy and radiation.

Material and methods: The medical records of 3 patients (2 women and 1 man) diagnosed LACMS were reviewed.

Results: The 3 craniofacial clinic complaining of pain, epistaxis, nasal respiratory failure, loss of visual acuity and intraocular pressure. Underwent CT detected a large mass at maxillary sinus with extension to adjacent structures. Stage III and IV. The biopsy was consistent with undifferentiated carcinoma. They were treated with neodjuvant QT (TPF: Cisplatin, Taxotere, 5-FU), 3-4 cycles and after treatment was performed with concomitant RT-QT (CDDP). The response after neoadjuvant QT was partial, with clinical improvement of initial symptoms. Then, all were treated with radiotherapy in LA with 6 MV photons after 3D planning. Total dose was 70 Gy concomitantly with CDDP. One patient had distant progression (liver) being locally controlled until the end of his life (survival 14 months). The other 2 patients are alive with negative radiological studies for progression. One of them has a following of five years and recently has been necessary to perform enucleation of the eye affected by aftermath. Another patient keeps track 26 month progression free and good quality of life time.

Conclusions: Treatment with chemoradiotherapy in locally advanced carcinoma of the maxillary sinus is a promising treatment, well tolerated and with acceptable results.

LONG-TERM RESULTS WITH RADICAL RADIOTHERAPY IN T1 GLOTTIC CARCINOMA

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Objective: To evaluate the influence of overall treatment time (OTT) and clinical prognostic factors on overall survival (OS) and local control (LC) on patients with T1N0M0 squamous cell glottis carcinoma.

Material and methods: A total of 100 patients with T1N0M0 squamous cell glottis carcinoma treated between 2000 and 2012 were retrospectively analyzed. Mean age: 62.14 years; 90 males, 10 female; stage: T1a:80, T1b:20. Treatment: radical external radiotherapy with a mean dose of 70 Gys (2 Gy/fraction) over a mean period of 49 days. Statistical analysis: Kaplan-Meier method and Chi-square test.

Results: The median follow-up period was 91.5 months. Five- and 10-year actuarial OS and disease free survival were 83% and 70%, and 70% and 57% respectively. Five- and 10-year actuarial LC and metastasis free survival were 84% and 77%, and 97% and 94% respectively. Eighteen patients had recurrent disease. Mean time to local recurrence was 80 months. Sex, stage, and grade were not statistically significant; however, high grade showed a trend to worse survival (p=0.082). The mean of OTT was similar in patients with or without recurrence disease (50 v s49 days, p=ns). Neither OTT nor biologically effective dose influenced in LC.

Conclusions: In our study, OTT is not a factor for LC of patients with T1 glottic cancer, which could be due to the fact that most patients have met the planned schedule. High grade shows a trend to worse survival. Our survival figures are in accordance with the literature, but further studies are needed to improve the outcomes in those patients.

NASOPHARYNGEAL CARCINOMA. INTERGROUP 0099: FEASIBILITY AND RESULTS

Linares Galiana, I.; Tovar Martín, M.I.; Martínez Carrillo, M.; Guerrero Tejada, R.; Del Moral Ávila, R.; Zurita Herrera, M.; Vargas Arrabal, M.P.; Rodríguez Pavón, S.; Prieto Prieto, C.; Expósito Hernández, J.

Objective: Nasopharyngeal carcinoma is a rare tumor in our country, whose treatment was based on schemes chemo-radiotherapy. The essay published by the Intergroup 0099 has demonstrated improved survival by what has been adopted as standard treatment. However, this treatment regimen causes significant toxicity, reason that has been widely criticized. The aim is to analyze patients treated according to this scheme in our department, to assess tolerance, compliance and outcomes.

Material and method: A retrospective study of all patients diagnosed with nasopharyngeal carcinoma and treated with the Intergroup 0099 scheme from 2003-2013: CDDP × 3 cycles, dose 100 mg/m^2 days 1, 22 and 43 with concomitant radiotherapy, total dose 70 Gy standard fractionation, 2 Gy/day, 5 days/week and adjuvant CDDP dose of 80 mg/m^2 day 1 and 5-FU dose 1000 mg/m^2 days 1-4/4 weeks × 3 cycles.

Results: We treated 30 patients with a median age of 49 years, 10% in stage I, 26.7% for stage II, 26.7% in stage III and stage IV 36.7%, of which 18 completed the concomitant but only 12 adjuvant. Toxicity highlights from our patients was: During the concomitance: 56.7% (17) oromucositis grade 3 and 26.7% (8) grade 4 skin toxicity 33.3% (10) of grade 3 neutropenia 6.7% (2) Grade 3, nausea and vomiting 23.3% (7) of grade 3, renal insufficiency 23.3% (7). During the adjuvant: oromucositis 20% (6) Grade 3 and 3.3% (1) grade 4 neutropenia 3.3% (1) grade 3 and 10% (3) grade 4 nausea and vomiting 10% (3) Grade 3 and 3.3% (1) grade 4 haematological toxicities other 10% (3) grade 3. 4 toxicity-related deaths were described. As for the response to treatment, there were 20 complete responses, five partial responses, 2 stabilizations and 3 progressions. At present 20 patients with no evidence of disease, 1 patient has evidence of disease, 8 deaths due to tumor and one death not due to tumor. The median disease-free survival was 30 months and median overall survival of 36 months, with a follow-up three years.

Conclusions: The schedule of the Intergroup 0099, produces a better answer, however, more studies should be conducted in this treatment regimen, since toxicity is not negligible at all, with frequent interruptions of treatment. We affirm that patients with the highest performance status are those who benefit to a greater extent, therefore, one of our roles should be to individualize treatment for each patient.

NON-NASOPHARYNGEAL LYMPHOEPITHELIOMA OF THE HEAD AND NECK

Prieto Prieto, C.; Tovar Martín, I.; Linares Galiana, I.; Rodriguez Pavon, S.; Vargas Arrabal, P.; Gentil Jimenez, M.A.; Del Moral Ávila, R.; Guerrero Tejada, R.; Martínez Carrillo, M.;Expósito Hernández, J.

Objective and purpose: Lymphoepithelioma commonly occurs in the nasopharynx, rarely at other sites. So, the clinical course and optimal treatment of non-nasopharyngeal lymphoepithelioma of the head and neck have not been well described. The main objective is to show the treatment and the results obtained in patients with this kind of tumour in our department.

Methods: Between 2005 and 2015, 4 patients were treated in our department. We reviewed their medical records. The primary tumour sites were parotid gland (2 patients), base of tongue (1 patient) and tonsil (1 patient). TNM staging system were I, II, IVA and IVB. Treatment consisted of surgery plus concomitant chemo-radiotherapy (intergroup 0099) in 2 patients, surgery plus adjuvant radiotherapy in 1 patient and only radiotherapy in another one. The median dose delivered to the primary tumour was 70 gray (Gy) and to the tumour bed 68 Gy (range 60-70 Gy).

Results: The median follow-up was 17 months. At the end of the study the locoregional control was 100%, no distant metastases were founded. One patient died by cardiac disease no related with the treatment. Acute side effects grade III were mucositis, radiodermitis and disphagia in some patients (two for each item). Toxicity grade IV was no registered. Late side effects were moderate xerostomia in all patients, minor hearing loss in one patient.

Conclusion: Because all of them underwent radiotherapy with a good control, we can conclude that non-nasopharygeal lymphoepithelioma is a radiosensitive disease. Albeit, more studies are necessary to define the role of surgery and chemotherapy.

ORGAN PRESERVATION IN NON-SURGICAL LOCALLY ADVANCED HEAD AND NECK TUMORS

Esteban García, A.; Lozano Martínez, A.J.; Cuéllar Rivas, M.A.; Sánchez Paz, R.; Escobar Páramo, S.; Romero Borque, A.

Purpose: To evaluate the response to a conservative treatment with radiotherapy and concomitant chemotherapy or cetuximab in patients with laryngeal carcinomas and other inoperable head and neck tumors in our department.

Materials and methods: We retrospectively analyzed 34 patients with squamous cell carcinoma who underwent conservative treatment between 2009 and 2014. These patients were not good surgical candidates due to tumor inaccessibility, comorbidities or refusal. Modalities of treatment were 3DCRT, IMRT and combined brachytherapy-3DCRT; concomitant to cisplatin (40 mg/m^2 weekly or 100 mg/m^2 every-3-weeks) or cetuximab (400 mg one week before RT followed by 250 mg/m^2 weekly during RT). Systemic treatment was prescribed and administrated by the Radiation Oncology department. Total dose 70 Gy (1.8-2.3 Gy/fraction).

Results: Primary sites included oral cavity (35%), larynx (29%), oropharynx (18%), parotid gland and hypopharynx. 20 patients had definite RT-cisplatin and 11 RT-cetuximab. IMRT was given to 20 patients, 3DCRT to 10 patients and 2 received combined brachytherapy. Disease-free survival and overall survival of the total sample were 52.9% and 53.1% respectively. Oral cavity and oropharyngeal tumors had worse DFS compared to laryngeal tumors (50% vs. 70%). Oral cavity tumors had the poorest results in OS (45% vs. 70% for laryngeal tumors). 4 patients underwent salvage surgery. Treatment with cetuximab had worse DFS (36.4% vs. 60% with cisplatin) and worse OS (p=0.06). Median DFS: oral tumors 24.7 months, laryngeal 35.4 months. Median OS: oral tumors 23.9 months, laryngeal 35.4 months.

Conclusion: A conservative approach for organ preservation with chemo-radiotherapy in locally advanced laryngeal and other head and neck tumors could be considered. Longer follow-up and greater samples are needed.

PALLIATIVE HYPOFRACTIONATED RADIOTHERAPY FOR INCURABLE HEAD AND NECK CANCER PATIENTS

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Purpose: Our aim is to report data on clinical response, outcomes and toxicities of a hypofractionated radiotherapy schedule for palliation in symptomatic head and neck cancer.

Methods: We assessed retrospectively 72 patients with incurable primary or nodal metastatic head and neck (H&N) cancer, treated between 2008 and 2014. Treatment schedule of 30 Gy or

36 Gy in 5 sessions of 6 Gy twice a week as published in phase II trial "Hypo Trial" was used. Median age was 70.3 years old. 72.2% cases presented with Stage IV. Adenopathic mass was the predominant presentation symptom ocurring in 44.4% cases. Most common site was larynx (22.2%).

Results: With a median follow up of 5.6 months (range 2-61 months), 86.1% patients experienced partial or complete symptoms palliation. Two months after radiation 54% cases had any radiological response. 19.5% patients presented severe mucositis but only 5.6% cases had severe odynophagia. By prescription dose, higher rates of acute mucositis grade 3 and severe odynophagia was observed in those cases treated with 36 Gy with respect those receiving 30 Gy (14% vs 25% for mucositis and 2.9% vs 9.4% respectively). Late toxicity has been very low. Median overall survival was 6.8 moths, with a median disease free survival of 4.4 months.

Conclusion: This hypofractionated radiation schedule is an effective treatment for palliation in incurable symptomatic H&N cancer with acceptable toxicity.

POSTOPERATIVE RADIOCHEMOTHERAPY IN HEAD AND NECK CANCER: 10 YEARS EXPERIENCE

Martínez, J.; Hervás, A.; Vallejo, M. C.; Ramos, A.

Purpose: Analyze the results of over 10 years experience with postoperative radiochemotherapy based in cisplatin 40 mg/m^2/week in patients diagnosed of locally advanced squamous cell carcinoma of head and neck.

Patients and methods: From October 2003 to June 2014, 97 patients were treated in our department. All patients received postoperative radiochemotherapy with adjuvant intent based in the same scheme: radiotherapy 50 Gy to clinical target volume and 66-70 Gy to areas with close margin or extracapsular lymph node involvement and weekly cisplatin at 40 mg/m^2 concomitant to radiotherapy.

Results: The median age was 59 years (range 36-76), 79% male and 18% female. 3.1% of all patiens were stage II, 9.3% stage III and 87.6% stage IV. Locations: 40.2% larynx, 39.2% oral cavity, 16.5% oropharynx and 4.1% hypopharynx. 76.2% of patients received at least 5 cycles of chemotherapy. G3 toxicity was observed in 33% of patients being mucositis and epitelitis the most frecuents. G4 toxicity was not detected in any patient. Median follow-up was 42 months (range 4-123). Two-year and five-year overall survival (OS), cause-especific survival (CSS) and disease-free survival (DFS) were 69.07% and 52.57%, 83.5% and 74.22%, 76.2% and 60.8%, respectively. A significant difference in OS and DFS was detected with a total time of radiotherapy >8 weeks.

Conclusions: In our series, postoperative radiochemotherapy based in weekly cisplatin at 40 mg/m^2 in patients diagnosed of locally advanced squamous cell carcinoma of head and neck offers a good toxicity profile and results comparable to those published in the literature with 3-weekly cisplatin scheme.

PREDICTIVE HISTOLOGIC RISK FACTORS IN EARLY ORAL SQUAMOUS CELL CARCINOMA

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Objectives: The aim of the study is to analyze the impact of three histological parameters on the incidence of recurrence in patients with low stage (T1, T2 N0) squamous cell carcinomas of oral cavity.

Patients and methods: Between January 2009-December 2013, 24 patients were diagnosed in our institution of oral cavity tumors, early stages, 50% T1N0 and 50% T2N0. Diagnosed localization of the patients were in 13 tongue, 5 floor of mouth, 2 retromolar trigone, 2 gingiva and 2 palatomaxillary. All patients were operated. We analyzed three well stablished histologic parameters: worst tumor pattern of invasion, perineural invasion and lymphocytic host response at the advancing tumor edge. Accordingly we classified the patients in low, intermediate and high risk categories.

Results: Median age was 60 years (range 28-89). Gender male 16 and female 8. 14 patients were high risk, 3 patients were intermedium risk, and 7 patients were low risk. Mediam distance tumor in high risk was 0,5 cm and intermedium risk was 0,7 cm. 3/14 patients high risk cathegory relapsed. Patients who relapsed were treated with adyuvant radiation theraphy, one patient of them had died by progression tumor. All patients had carcinomas who were resected with adequate margins.

Conclusions: According with these results we could recommend, by histologic parameters analysed, adjuvant RT to patients with negative margins but histologically classified as high-risk. Besides, patients with low or intermediate risk probably do not benefit of adjuvant RT.

PRIMARY SQUAMOUS CELL CARCINOMA OF THE LACRIMAL CARUNCLE: A CASE REPORT

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Objective: To report a case of squamous cell carcinoma of the lacrimal caruncle in our institution.

Methods and material: We report a case of a 58 years-old woman who had a mass in the medial angle of the eyelids aperture in the right eye. This patient had history of chronic dacryocystitis that was treated with surgery. Since last surgery, the tumour was quickly relapsed. MRI showed a mass of 3 cm that reached the orbit with bone invasion but without invasion of the eyeball. The biopsy reported squamous carcinoma. In tumour's committee, the decision was radiotherapy alone (surgery was too aggressive and patient refused to receive chemotherapy). We used a LINAC (Clinac DHX 2100 Varian) with the VMAT technique (RapidArc®). Doses: PTV1: billateral neck 59.4 Gy, PTV2: tumour: 60.2 Gy. Fraccionation: PTV1: 2.15 Gy/fx, PTV2: 1.8 Gy/fx. Energy: 6 MV photons. NOF: PTV1: 28, PTV2: 33.

Results: The toxicity we observed was: G2 radiodermitits, G2 disphagia, G2 xerostomia One month after the treatment, the patient was completely recovered 6-month MRI after the treatment: significant reduction of the mass. The otorhinolaryngologist recommended the patient to operate the rest of the tumor but patient refused surgery. One year later the patient has a good quality of life.

Conclusion: VMAT is a good technique to treat this kind of tumours due to difficult location and close proximity to OARs.

PROPHYLACTIC PERCUTANEOUS ENDOSCOPIC GASTROSTOMY (PEG) IN HEAD&NECK CANCERS TREATED WITH RADIOTHERAPY

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Introduction and objectives: Radiotherapy is one of the cornerstones of the treatment of Head&Neck-cancer patients but it is not without severe local side effects. The aim of this paper is to describe our experience introducing the use of PEG in their management.

Materials and methods: We evaluated 61 patients treated in our department in whom a PEG was placed prior to the start of radiotherapy (RT). We conducted a descriptive and inferential study to describe our experience and the factors that may be related to the use of PEG.

Results: 53 patients received bilateral-neck irradiation and 52 concurrent chemotherapy. 86.9% of patients utilized the PEG during RT, 60.7% exclusively. 36% of patients required it in more than 50% of daily caloric intake after a month. Mean weight loss was 3.6kg. 50.8% and 55.7% of patients suffered from acute Grade-3 mucositis and complete dysphagia respectively, but only in 18% a RT-break was required. Long term dysphagia (partial/complete) occurred in 16.4%. In one patient PEG had to be removed due to local complications. Bilateral neck irradiation was a predictor of the need of the gastrostomy during treatment. Chemotherapy had a significant impact in its early use during RT, long-term dysphagia and in the severity of the acute toxicity.

Conclusion: Placing a PEG before the beginning of the RT treatment in Head&Neck cancers in which bilateral neck is going to be treated or Chemotherapy administered, means an adequate approach to avoid weight loss and treatment interruptions with a low rate of side effects.

QUALITY OF LIFE AND SECOND TUMORS IN T1N0 GLOTTIC CARCINOMA

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Objectives: To evaluate quality of voice and life, Thyroidal toxicity and risk of second tumors in those patients.

Material and methods: Between 2000 and 2012 100 patients with diagnostic T1N0 glottic cancer treated with radical radiotherapy. The median follow-up was 91.5 months. Prospective assessment of quality of life (QoL, H&N35 questionnaire), voice handicap index (VHI, VHI 30) was performed in 25 patients. Blood determination of TSH, T4, T3 levels was performed in 19 patients. Second primary tumors were defined as tumors arising in other sites than the first tumor.

Results: Mean score (MS) for the VHI30 was 19.16, which is considered as a minimal amount of voice handicap. In the H&N 35 questionnaire the worses scores were dry mouth and thick saliva (MS 30.6 for both), most patient have no problems in open mouth, swallowing, speaking and social contact (MS of 0, 6.9, 18.6 and 16.6, respectively). A few patients have pain (MS of 3.6). None out of the 19 patients evaluated for thyroid alteration have neither clinical nor subclinical hypothyroidism. Mean TSH, T3, T4 were 2.32, 3.16 and 1.31, respectively. Mean TSH was not statistically different from standard values (P 0.34). Eighteen patients (18%) have second tumor, 11 lung, 2 prostates, 5 others. Ten years probability of second lung cancer was 28%.

Conclusions: Voice preservation and QL is good and Better than those described in cordectomy series. The high rate of second lung cancer justify the use of thoracic CT in the follow-up of these patients.

RADIATION TREATMENT TOLERANCE IN HEAD AND NECK ELDERLY PATIENTS. ITS RELATIONSHIP WITH THE CHARLSON INDEX

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Objective: To evaluate relationship between Charlson index and toxicity after radiotherapy in elderly patients (older 70p) affected by head and neck tumors.

Material and methods: 250 patients older than 70 years were evaluated in the head and neck tumor board between march 2010 and march 2013.78 of them were treated with radiotherapy (RT) even in radical (17p), adjuvant (44p) or concomitant (17p) intent. Mean age 77 y. (71-92). Locations were: 32% laryx-hypofarynx, 9% oropharynx, 24% oral cavity, 7.6% base of skull and others 21%. Charlson index score was ≥3 in 15p and <3 in 63p. Toxicities as mucositis, dermatitis, asthenia and feeding tube were registered using CTCAE.v3.

Results: At the end of the treatment toxicities were: asthenia G2 in 46%, radiodermitis 25% G2 and mucositis G3 in 25%. At 1 month: asthenia G1 50%, radiodermitis G1 30%, oral mucositis G1 17% and feeding tube in 3 patients. At 1 year Asthenia G1 29%, radiodermitis G1 12%. No differences in toxicity intensity has been detected between patients Charlson ≥3 or <3. Regarding recovery at one year patients with Charlson ≥3 presented less recover than patients with <3 score. (G2 7% vs 33%).

Conclusions: Toxicity in elderly population treated with RT in the head and neck area has the same behaviour than non elderly population. Charlson index is a good and easy test to predict recovery, however we believe than most specific tests are necessary to predict radiation tolerance.

RADIOPHYSICS ACTIONS, PLATFORM AND REPLANNING PROCESS STEPS FOR INITIAL DEPLOYMENT OF ADAPTED RADIOTHERAPY AT HOSPITAL LA PAZ

Huerga Cabrerizo, C.; Glaría Enríquez, L.A.; Corredoeira, E.; Huerta, C.; Ferrer, C.

During radiotherapy treatment patients experience changes in their anatomy. The anatomical variations experienced by patients during treatment change the dose distribution, diverting the fulfillment of the initially posed dosimetric/clinical objectives. These deviations may compromise the effectiveness of treatment and cause adverse events. Establishing decision algorithms is important both for the quality of the adaptation as the feasibility in high assistance services[1]. We describe the initial approach that we have established for the correction of these deviations based on adapting the initial radiotherapy treatment. Once clinical need of adaptation is detected (jointly by TER, Oncologists and Radiophysicians) CT anatomical data based on new immobilization conditions are taken again. By using a tool for merging and deformable registration (rigid and non-rigid, Velocity, Elekta) new CT is merged with the original, including changing contours to adjust the initial volumes approach to new anatomical data. The validation of deformable registrations is an important part of the process[2]. This new CT with contours is transferred to the regular contouring program (Focal) and the fusion adequacy is evaluated by radiophysics and oncology. Oncologist conduct verification and correction of adapted volumes. Radiophysicist makes a new planning process, integrating the different volumes administered dose with the slope dose. The uncertainty in dose deformation related to deformable image registration algorithm is considered[3]. After evaluated and approved new dosimetry the redundant quality control is performed. Finally a new treatment is performed. Patients in most cases not stopped treatment being performed, during preparation of adapted treatment interval, daily repositioning and controls. The goal is to shorten to the minimum that interval. After that adapted treatment is daily assessed. Clinical aspects of the process are described here through 4 cases.

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RARE SALIVARY GLAND TUMORS WITH POOR PROGNOSIS: REPORT OF CASES

García-Gómez, R.; Albert-Antequera, M.; Rodríguez-Cordón, M.; Herrando-Parreño, G.; Ortiz-Rodil, N.; Ferrer-Albiach, C.

Introduction: Salivary gland cancers are infrequent malignancies which represent <1% of all cancers and 3-6% of head and neck cancers. Surgery is the treatment of choice in rare salivary gland tumors with poor prognosis. The efficacy of adjuvant external beam radiotherapy (adj-EBRT) is unsubstantiated, but its use is advised by the increased risk of locoregional and distant recurrence.

Materials and methods: We retrospectively analyzed 8 patients, from March 2005 to March 2014, diagnosed of rare salivary gland tumors treated with surgery and adj-EBRT. Median age at diagnosis: 61.5 years. 87.5% were males. Most frequent location was parotid gland (62.5%). Histology: Epithelial-myoepithelial carcinoma (25%), undifferentiated large cell carcinoma (25%), malignant mixed tumor (25%), ductal carcinoma (25%). 50% of patients presented positive margins and 25% perineural invasion. Stage: ≥pT3:50%, ≥pN1:37.5%. EBRT technique used: IMRT (50%) and 3D (50%). Average dose to tumor bed was 62.7 Gy, and to cervical lymph node chains 58.7 Gy.

Results: Median disease-free interval: 29 months. Median follow-up time from RTE: 25 months. No locoregional relapse was observed and only one case of suspected distant relapse in lung at 28 months after RTE (histological confirmation pending).

Conclusions: Notwithstanding poor prognosis described in the literature, locoregional relapse was not observed, but one case of distant relapse suspected. Moreover, we observed good results with adjuvant RTE in our small sample, despite RTE has not prove effectiveness in the literature. Further studies would be needed since one of the major difficulties is the rarity of these tumors in clinical practice.

RE-IRRADIATION FOR HEAD AND NECK CANCER RECURRENCE: ACCELERATED HYPERDRACTIONATION SCHEME

Lorenzana Moreno, P.; Rodríguez Sánchez, A.; Fuertes Vélez, F.J.; Urquilla Ventura, K.B.; Sierra Marín, M.; Reta Decoreau, I.; Martín Urreta, J.C.

The aim of this article is to describe accelerated hyperfractionation scheme for re-irradiation in head and neck cancer recurrences. We report data from four locally recurrent head and neck cancer patients, treated with re-irradiation and concurrent chemotherapy. From September 2001 to March 2015, 4 patients (female n=1, male n=3), aged between 54 and 65 (mean age 60), with locally recurrent head and neck cancer (oropharyngeal and hypopharyngeal squamous cell carcinoma), were treated with re-irradiation, using intensity modulated radiotherapy (IMRT). Total cumulative dose was 67,5 Gy, using accelerated hypofractionation scheme, treating our patients twice daily, 1,5 Gy per fraction, with a lapse time of 6 hours between the two fractions, 5 days a week. Radiotherapy was delivered with simultaneous Chemotherapy, using CDDP or Cetuximab schemes. Total cumulative radiotherapy dose must be high enough (>60 Gy) due to achieve an appropriate local control. Re-irradiation is a feasible treatment option in locoregional head and neck cancer recurrences, and it offers curative potential, with acceptable acute and late toxicities. In our experience treating head and neck recurrences employing accelerated hypofractionation scheme, short term conclusions have been encouraging, although we are expecting further long term results.

REIRRADIATION IN LOCOREGIONALLY RECURRENT HEAD AND NECK CANCER PATIENTS

Rincon Cruz, D.F.; De la Torre Tomas, A.; Velasco Jimenez, J.; Gomez Jaramillo, R.; Garcia Cenoz, M.; Benlloch Rodriguez, R.; Romero Fernandez, J.; Garcia Jarabo, V.

Objectives: Retrospective analysis of treatment outcomes following reirradiation in recurrent head and neck cancer (RHNC) patients at our institute.

Materials and methods: from October 2007 to June 2014, 21 patients with RHNC (Primary site at study entry: Nasopharynx (NS) 13, Oropharynx 3, Larynx 3, Others 3) were included in the analysis. Eight underwent surgery (44.4%). Thirteen patients were treated with concurrent cetuximab and five patients with platinum based chemotherapy (PBC). First-time radiation median dose was 66 Gy. Gap between first and second course of radiation was 35.6 months (median). The median absolute dose of reirradiation was 50 Gy (EQD2 52 Gy; range 18-70). Techniques used were SBRT in 62% (n13), tomotherapy in 28.5% (n6) and 3DRT in 9.5% (n2). The scheme most used was 48 Gy (3 Gy/fraction) in 8 patients. Kaplan-Meier was generated for overall survival (OS) analysis.

Results: Twelve patients were alive without evidence of disease after a median follow-up of 13 months (1-129) from the reirradiation. OS rate at one year was 73% (NS primary cancer was 87.5% vs. 50% the others; p=0.08). OS rate at one year was 77% for cetuximab and 80% PBC (p n.s). OS rate at one year was 76% for patients with surgery vs. 71% without surgery (p n.s). Two patients probably died due toxicity: one stroke and one possible carotid artery blow up.

Conclusion: RHNC reirradiation is a valid alternative in the rescue of RHNC, especially for primary NS carcinoma, in our experience. SBRT with cetuximab treatment is feasible in these heavily treated patients.

REIRRADIATION OF UNRESCTABLE RECURRENT NASOPHARYNGEAL CARCINOMA WITH HELICAL TOMOTHERAPY

Garcia Ramirez, J.M.; Puebla, F.; Lopez Guerra, J.L.; Matute, R.; Marrone, I.; Miguez, C.; Sevillano, D.; Sanchez-Reyes, A.; Praena-Fernandez, J.M.; Azinovic, I.

Purpose: We assessed therapeutic outcomes of reirradiation with helical tomotherapy (HT) for locoregional recurrent nasopharyngeal carcinoma (LRNPC) patients.

Methods and materials: Treatment outcomes were evaluated retrospectively in 17 consecutive LRNPC patients receiving HT between 2006 and 2012. Median age was 57 years and most patients (n=13) were male. Simultaneous systemic therapy was applied in 5 patients.Initial treatment covered the gross tumor volume with a median dose of 70 Gy (60-81.6 Gy). Reirradiation was confined to the local relapse region with a median dose of 63 Gy (50-70.2 Gy).T he median time interval between initial and subsequent treatment was 42 months (11-126).

Results: The median follow up was 35 months for survivors. Three patients (18%) developed both local and distant recurrences and only one patient (6%) suffered from isolated local recurrence. Two-year overall survival, disease free survival and local control rates were 79%, 74% and 82%, respectively. Acute and late

grade 2 toxicities were observed in 8 patients (47%). No patient experienced late grade ≥3 toxicity. Late toxicity included fibrosis of skin, hypoacusia, dysphagia, and xerostomia. Patients with higher Karnofsky performance status scores associated with a lower risk of mortality (HR: 0.85, p=0.015). In addition, there was a tendency for having a lower risk of mortality with marginal significance in patients with higher re-radiation doses (HR:0.10, p=0.073) and for having a higher toxicity in patients with longer radiation treatments (HR:1.57, p=0.081).

Conclusion: Reirradiation with HT in patients with LRNPC is feasible and yields encouraging results in terms of local control and overall survival with acceptable toxicity.

RETROSPECTIVE ANALYSIS OF DVH FROM VMAT HEAD AND NECK PATIENTS

Pérez-Rozos, A.; Toledo, M.D.; Jerez Sainz, I.; Pamos Ureña, M.; García Ríos, I.; Gómez-Millán, J.; Jódar, C.; Lobato, M.; Medina Carmona, J.A.

Introduction and objective: To analyze dose volume histograms of a cohort of patients treated with VMAT for head and neck tumours.

Materials and methods: Head and Neck patients undergo CT simulation and target volumes and organ at risks were contoured in Philips Pinnacle TPS, then CT images and contours are exported to Elekta Monaco. A simultaneous integrated boost single arc VMAT was planned to administrate 54 Gy and 65 Gy to elective area and boost region respectively in 30 fractions using semi-automatic treatment planning with our constrains and plan template. DVH and technical parameters are exported from Monaco to a centralized database. Retrospective DVH analysis is performed using an in-house software and database that allows for elaborated statistics from organ at risks and target volumes.

Results: Analysing retrospective histograms it is possible to study time evolution of treatment technique expertice and homogeneity between physicians and dosimetrists. DVH graph of target volume shows high homogeneity in terms of coverage parameters and mean dose. NTCP distribution for organ at risk shows acceptance criteria with variability due to particular patient complexity. Population distribution of evaluation parameters allows for optimization of the treatment template.

Conclusions: Treatment planning registers and DVH database stablished in our service in 2005 allows for retrospective statistics and complex quality assurance of large series of patients. This study performed in a cohort of VMAT head and neck patients shows low variability for target volumes coverage parameters and adecuate control of doses to organ at risk.

RETROSPECTIVE REVIEW OF PATIENTS WITH OROPHARYNGEAL CARCINOMA

Miranda Labajos, S; Fernández Fornos, L.; Pomares Arias, A.; Ruiz Sánchez, M.; Dorado Rodríguez, P.; Espósito, R.D.; Planes Meseguer, D.; García Miragall, E.

Purpose: Review all of the patients treated in our department with oropharyngeal carcinoma to evaluate data on treatments performed, toxicity, local control and overall survival.

Material and methods: Retrospective review of 40 patients treated between May 2008-January 2015; with an age understood between 36-87 years with a median of age of 56 years. The locations were: tonsil (25); Base of tongue (3); soft palate (5); pharyngeal retromolar trigone (5) and pillar (2). The histologies have been: squamous cell ca in 38 patients; adenoid cystic carcinoma in a patient and undifferentiated carcinoma in another patient. The VPH only was realized in two patients in one of which was positive for the p16. The treatment received has depended on the location as well as the staging (surgery, induction chemotherapy, chemoradiotherapy or radiation therapy exclusive). Acute toxicity for xerostomia scale RTOG has been 15% G0; G1 65%; G2 20%; Acute toxicity for the dermitis G1 53%; G2 17%; G3 9% and 21% NC; acute toxicity for mucositis G1 20%; G2 50%; G3 12% and 18% NC.

Results: In a series of 40 patients reviewed, has lost the follow 5 of them. The data that we have reviewed have been: overall survival with a median follow-up of 21 months 51%; local control 61%; Rate survival cause-specifies: 20%. Two patients not completed treatment for mucositis G3-G4, that required hospital admisison. A patient was death by toxicity.

Conclusions: In our review of results in terms of toxicity and local contral have been acceptable.

RETROSPECTIVE STUDY OF PROPHYLACTIC NECK IRRADIATION OF H&N

Matías-Pérez, A.; Soria-Carreras, P.; Blanco-Villar, M.; Matskov, K.; Gil-Restrepo, C.; Alonso-Rodríguez, O.; Rodríguez-García, S.; Cigarral-García, C.; Macías-Hernández, V.; Perez-Romasanta, L.A.

H&N SCC includes a large group of cancers. Many patients are primarily treated with surgery, followed by RT. Studies concerning the outcome of elective irradiation of the N0 neck are scarce. The main purpose of the current study was to describe the results of elective irradiation in cN0 necks in single institutional series.

Material and methods: The population reviewed for this retrospective study was composed of a series of 102 postoperatively irradiated patients with either unilateral or bilateral cN0. Patients were treated at our hospital from 1997 to 2012. The majority of patients (92%) were men. The median age was 62 y. The analysis was carried out for each neck separately. All 102 patients (204 hemi-necks) underwent surgery of the primary tumor. 123 hemi-necks (cN0) were treated with elective nodal irradiation. 137 hemi-necks had undergone surgery (elective or therapeutic) and were pN+ 60 hemi-necks (43.8%).

Results: The risk of recurrence in a cN0 irradiated hemi-neck was 2% versus 14% in a cN+ irradiated hemi-neck. Prophylactic cN0-hemineck irradiation did not reduce the risk of in-field recurrence (3/123 after irradiation vs. 0/30 after no-irradiation). The risk of recurrence in 77 pN0 hemi-necks was 0% while in 55 pN+ hemi-necks (53 received RT) the recurrence risk was 18.2%. Analysis of prognostic factors for recurrence could not be accomplished due to the low number of events.

Conclusion: cN0/pN0 neck irradiation in the postoperative setting is debatable. Multicentric studies with high number of patients are needed in order to define adverse prognostic factors for recurrence.

ROLE OF NECK DISSECTION IN HEAD AND NECK CANCER

Martín, M.; García, J.; López, M.; Hinojar, A.; Manzanares, R.; Fernández, L.; Prada, J.; Cerezo, L.

Objective: Planned neck dissection after chemoradiotherapy (CRT) in locoregionally advanced head and neck cancer is controversial. The objective of the present study was to evaluate the influence of neck dissection on the long-term locoregional control and survival of patients with stage III-IV head and neck squamous cell carcinoma (HNSCC) after primary CRT.

Material and methods: We retrospectively analysed locoregional control, locoregional relapse-free survival (LRFS), and overall survival (OS) in 67 patients with locally-advanced HNSCC

treated with exclusive CRT at our department between January 1998 and December 2013.

Results: Complete clinical response was achieved in 36 of 67 patients (53.7%), partial response >50% in 17 pts (25.4%), stable disease in 3 (4.5%); 9 patients (13.4%) developed disease progression during treatment. At a median follow-up of 35 months, LRFS and OS were 100% in patients with complete response and neck dissection versus 77.9% and 79.8%, respectively, in patients who did not undergo neck dissection (p=ns). The only independent prognostic factor for locoregional control was complete response to CRT.

Conclusions: Patients who achieve a complete clinical response to CRT have a very low risk of isolated neck recurrence and, therefore, planned neck dissection may not be justified in such cases. Clinical and radiographic identification of patients with residual disease following CRT who could benefit from neck dissection remains challenging.

ROLE OF RADIOTHERAPY IN NON SURGICAL LYMPHOEPITHELIAL ETMOIDES CARCINOMA

Sánchez Belda, M.; Rubí Olea, L.; Sanmamed Salgado, N.; Diezhandino García, P.; Alonso Martínez, P.; Herrera Román, M.; Alonso Hernandez, D.; del Castillo Belmonte, A.: Soto de Prado Otero, D.; López-Lara Martín, F.

Introduction: Lymphoepithelial carcinoma (LEC) is a rare malignancy often appearing in the nasopharynx but also in upper and lower aerodigestive sites with strong etiological association with Epstein-Barr virus. It may be asymptomatic or with non-specific obstructive nasal symptoms which makes its pre-operative diagnosis very challenging. The recommended treatment is surgical excision and optional adjuvant radiotherapy or chemo-radiotherapy.

Material and methods: A 69 year old patient with proptosis, diplopia, decreased visual acuity and paroxysmal pain. Imaging tests showed thickening in ocular muscles, pathological tissue in orbital fissure extending to middle cranial fossa, pterygopalatine fossa, II and III branch of the V cranial nerve and optic nerve, sphenoid greater wing, optic foramen and Zinn tendon. Positive for LEC after ethmoid biopsy. Due to its location, surgery was rejected and induced chemotherapy with partial response was taken. After that, it was administered modulated intensity radiotherapy 60 Gy in orbital lesion and nodal areas at risk up to 50 Gy.

Results: Tolerance to radiotherapy was excellent with no striking side effects. Post-treatment year scan presents stability of the lesion without worsening his basal clinical state or progression.

Conclusions: LEC is a rare malignancy and surgery is the treatment of choice. No established treatment approach due to rarity of cases. With extensive disease, adjuvant chemotherapy and neck management may be required. LEC is radiosensitive, even when there is lymph node metastasis. New techniques of radiotherapy is a option, when surgery is not possible and/or there is little response to chemotherapy, with low toxicity and good tolerance.

SECOND TUMOURS INCIDENCE IN HEAD AND NECK CANCER

Navarro Bergadá, A.V.; Soler Tortosa, M.; Ferrer Ramírez, M.J.; Saiz Monfort, V.; Lorca Chapa, J.; Jornet Fayos, J.; Vañó Molina, M.; Molina Luque, E.M.

Objectives and purposes: It's known that patients with head and neck cancer have a trend to develop second tumours, especially in the lung. Our purpose is to describe the incidence and characteristics of second tumours in our patients.

Material and methods: Between September 2007 and December 2012, 225 patients with head and neck cancer received radical treatment including, at least, radiotherapy. We collected data from anamnesis at the first evaluation and monitorized them with periodical clinical and radiological examination after the treatments in order to detect relapses and/or second tumours.

Results: With a median follow-up of 34.45 months, 19% (43) of the 225 cases developed second malignancies. The incidence by location was, in decreasing order: bronchopulmonary tumours 9% (21) (47% related to second tumours); urological: 3% (7); digestive tumours: 2% (5); second ORL tumours: 2% (4), and other locations (breast, skin, blood): 3% (6). Patients with laryngeal cancer were those who developed second tumours more frequently (44% corresponding to 19 of the 43 cases).

Conclusion: The incidence of second malignancies in patients treated of head and neck cancer is close to 20% in our study, being approximately half of these corresponding to lung carcinomas. Hence, it is mandatory clinical follow-up of these patients attending any symptoms that can alert a second primary cancer as well as the inclusion of chest radiological examinations in addition to ORL in order to find second tumours in early stages.

SIMULTANEUS INTEGRATED BOOST USING 3D CONFORMAL RADIOTHERAPY

Torres, A.; Cabrera, J.J.; Corbacho, A.; Ruiz, A.; González, M.A.; Muñoz, J.L.; Quirós, J.; Ropero, F.; Ríos, Y.

Purpose: To analyze the feasibility of administering simultaneous integrated boost (SIB) using 3D conformal radiotherapy (3D-CRT) under IMRT dosimetric criteria in patients with head and neck squamous cell cancer.

Materials and methods: 18 patients, median age: 65 years. Locations: hypopharynx: 7, supraglottis: 6, base of tongue: 2, larynx: 2, amygdala: 1. Stage IVA 50%, III 22.2%. Concomitant chemotherapy: 45%. Protocol: definition of volumes and dosimetry according to RTOG 0022; PTV low risk (PTV-LR) includes regions at risk of subclinical disease plus macroscopic disease (GTV), PTV high risk (PTV-HR) including only GTV. Total doses: PTV-LR was 54 Gy @1,8 Gy, PTV-HR 66 Gy @2,2 Gy by SIB of 0.4 Gy/fx. Main endpoint: assessing than 3D-CRT plans complies the following dosimetric criteria for PTV-HR: V60 ≥99%, D90≥62.7 Gy and no more than 20% of PTV-HR receives a dose ≥110% (72.6 Gy). Secondary endpoints: acute toxicity and survival.

Results: Median V60: 99.25% (IQR 97.65-99.75) range 91-100. Median D90: 64.34 Gy (IQR 63.84-65.2) and median Dmax: 71.9 Gy (IQR 70.8-72.2). Acute toxicity grade 3 or worse: Dysphagia: 27.8%, mucositis: 50%, grade IV 11.1%; skin: 11.1%; neutropenia: 5 patients, thrombocytopenia: 3 patients. Median follow-up (months): 5.1 (IQR 3.4-8.8). Median overall survival: 11 months (95% CI 2-20). Median disease-free survival: 11 months (95% CI 2-20).

Conclusions: Fulfilling V60 criterion can be difficult in some patients. The rest of criteria are feasible by 3DCRT but with careful assessment of cold spots. SIB with 3D-CRT can be used in routine clinical basis.

SINONASAL UNDIFFERENTIATED CARCINOMA: A CASE REPORT

Cabezas Mendoza, A.M.; Ruiz Alonso, A.; Guardado Gonzáles, S.; Martín Sánchez, M.; Pedraza Fernández, S.; Chávez Jimenez, T.C.; Pérez Montero, H.; Colmenero Hernández, M.; Gascón Costoso, N.; Pérez-Regadera Gómez, J.F.

Introduction: Sinonasal undifferentiated carcinoma (SUC) is an uncommon aggressive neoplasm. Patients have a poor prognosis and locally advanced disease at the time of presentation.

Methods: We report a 32 year–old man with maxilar pain that radiates to the right side of the forehead and proptosis for three months. He also presented diplopia and epistaxis. Nasofibroscopy showed an erythematous and friable mass in the right nose. CT and MR sinonasal showed a tumor arising from the ethmoid sinus, extending through the cribriform plate into the anterior cranial fossa and with lateral extension through the orbital wall (cT4bN0M0). Microscopic examination of the biopsy specimen revealed a SUC Chemoradiotherapy was administered. Three cycles of Cisplatin and Radiation therapy using intensity-modulated (IMRT) was given in 35 fractions. The target volumes were: PTV1 includes primary tumor, total dose of 66 Gy, 2 Gy per fraction. PTV2: tumor volume + ethmoid sinus + retropharyngeal lymph nodes, a total dose of 60 Gy at 1.8 Gy per fraction. PTV3: tumor volumen + and bilateral neck I-II levels and III-IV right side, total dose of 54 Gy at 1.6 Gy per fraction. We noticed a significative reduction of proptosis after reached a dosis of 6 Gy. Therefore, we made a new CT and restoration of dose homogeneity within this GTV required adaptive replanning. Follow-up at 7 months has not shown recurrence or metastasis.

Conclusion: SUC is an uncommon neoplasm. Advanced stages of disease require a multidisciplinary approach. Regarding to radiotherapy, new techniques like IMRT or Adaptive radiotherapy can be used.

STARTING ART FOR IMRT HEAD-AND-NECK IN A TYPICALLY CLINICAL CENTER

Bernisz, M.Y.; Lliso, F.; Badal, M.D.; Candela, C.; Martinez, F.; Soler, A.; Chicas, R.; Burgos, J.; Bautista, J.A.; Perez Calatayud, J.

Head and neck cancer patients undergoing radiotherapy can suffer anatomic changes; these alterations can lead to clinically significant dosimetric variations, and need to be addressed by adaptive radiotherapy. The purpose of this work is to present the methodology of the protocol which is being incorporated at our department, with typical clinical workload, as a first step in ART. All head and neck patients are treated at Clinac iX Varian linacs, undergoing IMRT with RapidArc. A CT simulation scan is performed; PTVs and OARs are contoured at Eclipse (V 13.0, Varian) as well as dosimetric planning, by applying the department protocol constraints. The first step ART protocol we have implemented consists of: when significant changes are noticed (on the CBCT images,, a new CT scan is performed; initial CT is registered with the actual one by a deformable registration (Smart Adapt, Varian); the original plan is re-calculated on the new anatomy to firstly know whether it is acceptable or not per fraction; if not, the treatment stops and the plan is re-optimized; if yes, the need of re-optimization is evaluated based on the CBCT images review, by estimating the fraction of treatment that can be considered unchanged. From the 30 head and neck cancer patients treated at our department, in 30% CT scan has been repeated, the number of fractions at which this occurred ranged from 20 and 25. About half needed to be re-planned. An ART strategy has been adopted compatible with the typical clinical workload.

SURVIVAL RISK FACTORS ANALYSIS IN PATIENTS WITH ADENOID CYSTIC CARCINOMA OF THE HEAD AND NECK. A SINGLE CENTER RESULTS

Lozano, A.; Ramirez, J.; Navarro, A.; Martinez, E.; Galiana, R.; Maños, M.; Mari, A.; Viñals, J.M.; Navarro-Perez, V.; Guedea, F.

Objective: To evaluate prognostic factors of survival in adenoid cystic carcinoma.

Material and methods: 47 patients (p) have been diagnosed and treated by UFCC (Head and Neck Funcional Unit) ICO- Bellvitge during 1999-2013. Adjuvant radiotherapy was performed in 32 cases. Stage, perineural invasion, type of treatment (local or locorregional), dose of radiotherapy and location of primary tumor have been evaluated. Median age 55.5 (28-82 y), 15 were male and 17 female. Location: major glands: 18 (56%), oral cavity 2 (6%), larynx and trachea 1 (3%), pharynx 3 (9.4%) and paranasal sinuses 4 cases(13%). Perineural invasion was present in 84%. Surgery: 17 p (53%) on primary site, 47% primary plus lymph node disecction. Radiotherapy total dose: 60 Gy in 10 p. (31%) and ≤66 Gy in 22 p. (69%) of the cases. Margins afected (R1): 20 p. 62.5%. Metastatic status was present in 12 p (37%); 9 of them in lung.

Results: After mean of follow up of 63 months (r 15-171) overall survival (OS), disease free survival (DFS) and locoregional control (LRC) were: 84.4%, 59% and 79% respectively. No prognostic factors of survival were identified at this study.

Conclusions: Collaborative studies between different centers are necessary to increase our sample size and identify prognostic factors.

SYNOVIAL SARCOMA V LEFT PAIR INOPERABLE: CASE REPORT

Cardenas Canovas, E.; García Matinez, V.; De la Fuente Muñoz, I.

Aims and purposes: Synovial sarcoma sheath V cranial nerve is a rare disease that causes trigeminal neuralgia unresponsive to standard treatment with neuroleptics. The aim of radiotherapy is the functional conservation of the trigeminal eliminating pain as possible.

Material and methods: 75 year old male patient diagnosed with trigeminal neuralgia longstanding. MRI tumor is detected at the output of V left pair. Biopsy results synovial sarcoma of the nerve sheath is made. Given the irresecabilidad of the tumor was decided treatment with external radiotherapy. TAC simulation is performed with thermoplastic mask with stereotactic system (BrainLab). 7 non-coplanar beams are planned. Total dose 54 Gy to 4.5 Gy/fraction in 12 fractions (DBE 75 Gy) on consecutive days.

Results: The patient completed treatment with good acute tolerance, reducing the initial pain (EVA pre-treatment 9/EVA post-treatment 4). 1 month later in the inquiry, is not painful or the use of Neuroleptic is required. MRI monitoring three months, 70% tumor reduction. At 12 months the patient has no pain. Dies by previous cardio-pulmonary diseases.

Conclusion: Hypofractionated radiation therapy may be an option for treatment of synovial sarcomas of cranial nerves.

TECTUM IN THE PREVENTION AND TREATMENT OF ACUTE RADIATION DERMATITIS

Umbrarescu, E.; Benitez, J.F.; Giménez, D.; Buitrago, P.; Rial, E.; Barrullas, S.; de Vega, J.M.; Sancho, G.; Craven-Bartle, J.; Farré, N.

Background: Acute dermatitis is a common toxicity observed in patients with head and neck tumors following external beam radiotherapy. The addition of some agents to moisture cream have been proposed to prevent and decreased the skin toxicity. Tectum-11 is the principal active component of Tectum cream that contains an eleven amino acid peptide that activates mechanisms of protection and repair of DNA of the basal keratinocytes of the epidermis.

Objectives: To assess the efficacy of Tectum cream in preventing and reducing acute radiation dermatitis in patients with head and neck tumors under radiation treatment.

Material and methods: Seven patients with head and neck tumors were enrolled in this study. All of them were treated with radical 3D conformal external beam radiotherapy with (3 patients) or without concomitant chemotherapy. Tectum cream was applied daily during the whole treatment and two weeks later. Weekly assessment of the skin toxicity was performed by both a doctor and a nurse according to the RTOG criteria.

Results: The maximum skin toxicity observed during the course of treatment was as follows: Grade 0-1 toxicity, 71% (5 patients); Grade 2, 29% (2 patients); Grade 3-4, 0%. Most radiation induced dermatitis occurred by the third week of the treatment.

Conclusion: Patients using tectum cream during radiation treatment showed low grade acute skin toxicity. These results deserve further investigation.

TONGUE SQUAMOUS CELL CARCINOMA: BIOMARKERS RELATED WITH CELL CYCLE REGULATION

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Objectives: The aim of this study is to identify which biomarkers could be related with progression and survival in Tongue Squamous Cell Carcinoma (TSCC).

Methods: Between 2004 and 2012, 100 patients, 56 men and 44 women were treated. Mean follow-up 92.16 months. Mean age 61.78 years. Tumor stage I-II 70%, III-IV 30%. Treatment: 87 surgery, 29 with adjuvant radiotherapy ± chemotherapy, 11 radical radiotherapy.The expression of p53, RB, p16,CDK2, cyclin B1, p27, cyclin A and p21 in the cancer cells was assessed immunohistochemically using tissue microarrays. We used the 15% labeling index as a cutoff point in cyclin B1 and cyclin A; 5% in CDK2; 10% in p53, RB, p27, p21 and p16. Overall (OS), disease-free survival (DFS) and locoregional failure-free survival (LFS) were estimated by Kaplan-Meier method and the results were compared using the Log-rank test.

Results: Recurrence 40%. OS, DFS and LFS rates to two years were 77.96%, 82.34% and 67.56%, to four years 66.52%, 70.7%, 56.95% respectively and to seven years 56.33% OS and 56.53% DFS. Biomarkers: p53 was statistically significant for OS (p=0.0025, LFS (p=0.0025); p21 for DFS (p=0.0485). RB was near significance for OS (p=0.0789), DFS (p=0.0666), LFS (p=0.0996) and CDK2 only for OS (p=0.0906).

Conclusions: This study shows a significant predictive value for p53 (worse prognosis) to OS and LFS and p21 (better prognosis) to DFS in TSCC. RB and CDK2 could also be useful markers and needs to be further investigated.

TREATMENT AND RESULTS IN LOCALLY ADVANCED H&N TUMORS. OUR EXPERIENCE

Navarro Bergadá, A.V.; Soler Tortosa, M.; Lorca Chapa, J.; Ferrer Ramírez, MJ.; Saiz Monfort, V.; Sahuquillo Arce, E.; Jornet Fayos, J.; Lopez Muñoz, M.; Monroy Antón, J.L.; Estornell Gualde, M.A.

Objectives and purposes: Radiotherapy in combination with chemotherapy with or without surgery, has shown good results in patients with locally advanced head and neck tumours, especially the chemoradiation. This option is increasing because of the advantage of organ preservation. Our purpose is to describe the treatment and results of survival in a group of patients treated in our hospital.

Material and methods: Between September 2007 and December 2012, 153 patients with locally advanced head and neck tumours (III and IV) received radical treatment. 132 (86%) were males. The mean age was 60.9 years (16-85). In terms of treatment, 62% (95) received chemoradiation, 18% (27) adjuvant chemoradiation, 14% (21) were treated with adjuvant radiotherapy after surgery, and 7% (10) received radical radiotherapy only. As for radiotherapy technique, we used 3D in 138 cases (90.8%) and IMRT in the remaining 14 (9.2%).

Results: With a median follow-up of 31.79 months, the overall survival after 2, 3 and 5 years was 69.29% (CI 95%: 61, 31-75, 93), 63.40% (CI 95%: (55, 24-70, 47) and 58.17% (CI 95%: 49, 94-65, 52) respectively. The disease-free survival after 2, 3, and 5 year was 56.21% (CI 95%: 47, 98-63, 64), 54.90% (CI 95%: 46, 68-62, 38) and 51.63% (CI 95%: 43, 45-59, 21) respectively.

Conclusion: The results of treatment in our serie of cases are comparable to those described in the literature. Conservative treatment with chemoradiation is an option in most of these patients, without downplaying the role of surgery.

TREATMENT OF HEAD AND NECK TUMORS: IMRT VERSUS HELICAL TOMOTHERAPY

Arregui López, E.; Pérez Álvarez, M.E.; Zapata Jiménez, J.C.; Sanz Martín, M.M.; Gil Agudo, A.; Morera López, R.

Objective: The purpose of this study was to perform a dosimetric comparison of HT versus intensity-modulated radiation therapy (IMRT) in head and neck tumors (HNT).

Material and methods: A total of 38 treatment plans, 19 patients were treated with IMRT and 19 were analyzed with HT. We studied 10 oral cavity, 10 oropharyngeal and 18 larynx cases. The variables used to compare treatment plans were: conformity (CI) and homogeneity index (HI) for planning target volumes (PTV54, 60, 66), coverage rates for different volumes (CobI95%, 98%, 100%) and dosimetric characteristics of the risk organs (OARs: D50% and Dmed of homolateral and contralateral parotids and Dmax and D1cc of spinal cord volumen with 0.5 cm margin=CRV).

Results: Median HI and CI were the best for HT plans with high statistical except the IC66 (p=0.242). When we calculate the median coverage rates, the difference in the HT regarding IMRT is very important. Only CobI 98% in PTV66 was not different (p=0.085). The largest reduction of maximum dose CRV was achieved for HT plans. Mean dose for homolateral and contralateral parotids was similar en all plans (p=0.315 and p=0.119, respectively).

Conclusions: HT is capable of producing conformal and homogeneous treatment plans with a good coverage in nearly 100% of the volume. HT can be a better option in treating HNT as compared to IMRT and plans resulted superior with a reduction in the dose to spinal cord. However, we need to consider more patients to find a benefit in median dose to the parotid glands.

TUMOR RECURRENCE VS RADIONECROSIS IN HEAD AND NECK CANCER

Lorenzana Moreno, P.; Rodríguez Sánchez, A.; Sierra Marín, M.; Urquilla Ventura, K.B.; Fuertes Vélez, F.J.; Martín Urreta, J.C.

To assess outcomes of a nasopharyngeal squamous cell carcinoma case who presented with a suspicion of recurrence vs treatment toxicity nineteen years after radiotherapy. We repot the case of a male caucasian patient, aged 68, with diagnosis of nasopharyngeal squamous cell carcinoma with skull base involvement, T4N1 (stage IV), treated on December 1996 with conventional radiation therapy as follws: 70 Gy to the gross tu-

mor volume, and 50 Gy to the neck nodal areas, with medular exclusion at the 40 Gy dose. Following treatment development, there was no visible tumor mass on endoscopic and radiological examination, therefore our patient followed regular inspection in a private centre. From April 2014 our patient began with clinical symptoms, such as headache and right nasal and orbitary areas. After several examinations, such as TC, RM, endoscopic research and serialized biopsies, medical tests did not demonstrate tumor recurrence, therefore we only can implicate patient findings with radion therapy injury. Previously irradiated tissues are characterized by fibro-atrophic changes, with impaired cellular proliferation, hypoxia and decreased vascularity. This changes can persist long after radiation therapy. Several studies had shown the value of hyperbaric oxygen therapy in patients with laryngeal, oropharyngeal and nasopharyngeal cancer who develop radionecrosis following radiotherapy. Radionecrosis is a possible toxicity tah can follow radiation therapy, and its an entity to considerate when medical tests dismiss the tumor recurrence possibility.

DIGESTIVE TUMORS

^{18}FDG PET-CT FOR STAGING AND RADIOTHERAPY PLANNING IN RECTAL CANCER

Pedraza Fernández, S.; Sánchez Fuentes, D.; Pérez Escutia, M.A.; Ruiz Solís, S.; Pérez Montero, H.; Bartolomé Villar, A.; Peña Sánchez, M.C.; Cabeza Rodríguez, M.A.; Lora Pablos, D.; Pérez Regadera, J.F.

Purpose: The aim of this study is to analyze the use of ^{18}FDG PET-CT imaging in rectal cancer, both in staging and radiotherapy treatment volumes.

Methods and materials: Fifty-seven consecutive patients (pts.) (34 (59.65%) men, 23 (40.35%) women, mean age: 63 years, range: 40-72 years) with locally advanced rectal cancer (LARC) were included in the study. Clinical stage according to AJCC 7th: II: 14 (24.45%); III: 40 (70.18%); IV: 3 (5.26%, only liver metastases). Pts. were staged by undergoing a thoracic-abdominal-pelvic CT and a pelvic MRI. Also an ^{18}FDG PET-CT which was executed in the specific radiotherapy positioning was realized at diagnosis and both staging systems were compared.

Results: ^{18}FDG PET-CT detected 2 synchronous tumors and 2 cases of metastases requiring a palliative treatment. Tumor staging varied in 18 pts (31.58%; 9 increased, 9 decreased). 5 of the cases which increased, were finally staged as T4b which implies a modification in pelvic target volume planning (PTV) by adding the external iliac lymph nodes. Variations in nodal staging were observed in 36 pts (63.16%); 14 (24.56%) corresponds to N0 that turned into N+ and 4 (7.02%) to the other way round. Those findings should be taken into consideration when planning the Nodal-PTV.

Conclusions: The success of radiotherapy depends on an adequate treatment planning. ^{18}FDG PET-TC has the potential to influence the therapeutic strategy and allows a better precision when contouring treatment volumes.

^{18}FDG PET-CT PREDIGTING THE RESPONSE TO NEOADJUVANT RECTAL CANCER TREATMENT

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Purpose: To assess the utility of 18-FDG PET-CT in patients (pts.) with local advanced rectal cancer (LARC) in evaluating the response to neoadjuvant radiochemotherapy (RQT) through our experience.

Materials and methods: Thirty-nine pts. (mean age: 62 (40-83)) with LARC who underwent a 18-FDG PET-CT in radiotherapy (RT) planning conditions were enrolled from September 2009 to May 2014. Tumor location: 17 (43.85%) higher rectum, 14 (35.89%) medium, 8 (20.51%) inferior. Histology: 37 (94.87%) adenocarcinoma, 2 (5.13%) mucinous adenocarcinoma. Tumor staging: 7 (17.95%) II, 31 (79.48%) III, 1 (2.56%) IV (liver metastases). All pts. received RT (4500 to 5040 cGy) in concurrence with Capecitabine and underwent a low anterior resection (32 pts-82.05%) or an abdominoperineal resection (7 pts-17.95%).

Results: After RQT, in 7 of 39 pts (17.94%) there was no evidence of residual tumor in the surgical piece (complete pathologic response, pCR). Pts. were classified according to Mandard Tumor Regression (MTR) in responders (14pts-35.9%) and non-responders (25 pts-64.10%). Significant differences between both groups were not seen when assessing tumor size, tumor SUVmax, nodal SUVmax or staging, although higher levels of SUVmax and size were found in non-responders group. Histopathological responders had better overall survival and free disease survival compared to non-responders, however this was not statistically significant (p=0.37 and p=0.73, respectively). Referring to staging, there is a significant association between the tumor size measured by the NMR and measured by the 18-FDG PET-CT. (Rho=0.49 (p=0.003)).

Conclusions: In our cohort, 18-FDG PET-CT parameters cannot predict the tumor response to RQT. Multi-institutional trials are required to establish stronger conclusion on this matter.

ADJUVANT RADIOCHEMOTHERAPY FOR GASTRIC CANCER: SURVIVAL AND PROGNOSTIC FACTORS

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Objectives: The aim of this study was to investigate the impact on survival of patients with locally advanced gastric cancer (LAGC) treated with adyuvant radiochemotherapy according Macdonald scheme.

Methods: Between May 2004 and October 2014, 106 patients, 70 men and 36 women, with LAGC were treated. Mean age 57 years. Mean follow-up 96.48 months. The T stage were T3 (52.83%), T4 (22.64%) and 86.79% had nodal metastases, with an average of 8.24 nodes involved. Predominant histological subtype was diffuse (43.4%) and poorly differentiated (grade 3, 50%). Complete resection (R0) 84.91%, whereas microscopic residual disease (R1) 13.21%. Survival was calculated by Kaplan-Meier, differences by the Log-rank test and multivariate analysis by Cox proportional hazards regression model.

Results: 50 patients (47.16%) relapsed; 16 (15.09%) locoregional, 13 (12.26%) peritoneal, 18 (16.98%) distant metastases and 3 (2.83%) unknown. The overall survival (OS), disease-free survival (DFS), locoregional failure-free survival (LFS) rates to three years were 48.75%, 46.27% and 76.72% and to five years were 32.11%, 38.78%, 69.67% respectively. Univariate analysis, T stage (T1-T2), N negative stage and R0 were associated with better survival ($p<0.05$) for OS and only N negative stage for DFS and LFS. Multivariate analysis indentified only R0 as an independent predictor of better survival ($p<0.05$) for OS and DFS.

Conclusions: In LAGC treated with adyuvant radiochemotherapy, complete R0 resection can be considered as independent prognostic factor.

ADJUVANT THERAPY IN GASTRIC ADENOCARCINOMA: TEN YEARS OF EXPERIENCE

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Purpose and objective(s): Adjuvant therapy in gastric adenocarcinoma: ten years of experience.

Materials and methods: Retrospective study in 136 p. with gastric adenocarcinoma treated with surgery R0 - 1 and ≤D2 lymphadenectomy between 08.06.2001 and 19.03.2014 who received adjuvant QTRT based on INT-0116 scheme. Statistical Material SPSS 22. Average age 62. Males 66.2%. By location, antrum 47.8%, body 36.8%, cardias 3.7% multicentric 3.7%, pylorus 5.9%, stump 2.2%. Total gastrectomy 43.4%. Edge + microscopic 12.5%. Average of lymph nodes removed: 20.08 (0-55) with 6.5 (0-33) affected. D2 lymphadenectomy 40.7%.

Results: Complete adjuvant therapy 83.1%. Stadium: pT1 4.4%, pT2 31.9%, pT3 51.9%, pT4 11.9%, pN0 17%, pN1 38.5%, ≥pN2 44.4%. Toxicity with hospital admission 30.3%. Toxicity ≥G3: hematologic 46.2%, gastrointestinal 19.3%, pain 1.7%, infection 10.1%, none 20.2%. Relapse: local 5.9%, regional 2.9%, peritoneal 14%, distant 23.6%. Median follow up 70 months. Overall survival at 3 years was 53.8% and 39.2% at 5 years. Significant prognostic factors in multivariate analysis: gender, + edge and stage.

Conclusions: The results obtained in our study, even with adverse prognostic factors, are comparable to those presented by the U.S. Intergroup and confirm the efficacy of treatment with acceptable toxicity.

ANAL CANCER: IMRT SCHEME EXPERIENCE IN LOCALLY ADVANCED STAGE

Lorenzana Moreno, P.; Fuertes Vélez, F.J.; Sierra Marín, M.; Urquilla Ventura, K.B.; Reta Decoreau, I.; Martín Urreta, J.C.

The aim of this review is to analyze the use of IMRT (Intensity Modulated Radiation Therapy), in the treatment of locally advanced epidermoid anal cancer, employing the contouring methods based on the AGIT consensus contouring atlas guideline and the RTOG 0529 study. We reviewed 3 cases of locally advanced epidermoid anal cancer, treated in our centre, using IMRT techniques, following the AGIT contouring atlas, and the RTOG 0529 guidelines, form March 2014 to December 2014. Three women, aged between 51 and 54 years-old (mean age 52) with diagnosis of locally advanced anal cancer, were treated using IMRT technique, reaching a total cumulative dose of 54 Gy to the gross tumor volume, and 45 Gy to the elective nodal volumes, delivered in 30 fractions, 5 days per week. We followed the planning contouring atlas to delimit the clinical target volume, deffining gross disease area, nodal volumes at risk, and security margins to take into consideration. Organs at risk were also included. Finally we analyze the associated toxicity in our patients. Acute grade gastrointestinal and genitourinary toxicity was seen in these patients, specially in vulvar and perianal areas. High grade toxicity was dermical and hematological, and occurred in patients receiving concurrent chemotherapy schemes. IMRT is well tolerated with acceptable treatment interruptions allowing dose escalation in locally advanced anal cancer. obtaining great local control of disease. One patient benefited of a radiation boost delivered using brachytherapy.

CHANGE OF INDICATION IN THE TREATMENT OF CANCER OF THE ESOPHAGUS AFTER PET/CT

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Introduction: The neoadjuvant chemo-radiotherapy has demonstrated a survival benefit in patients with locally advanced tumors. The objective of this study is to explore the impact of planning PETTAC changing the therapeutic indication. The current guidelines suggest PET may potentially improve the planning of radiotherapy although its role is not standardized today

Material: From May 2011 to May 2015 a total of 17 patients were diagnosed with locally advanced esophageal cancer treatment potential candidates CTRT. PET CT staging were performed at RT treatment position for subsequent use in planning. All had previous study extension TAC that made them candidates for locoregional treatment.

Results: Two patients had cervical location, 12 mid-thoracic and distal rest. 50% of the patients change the indication of treatment with chemoradiotherapy, contraindicated in all cases due to nodal disease not documented in prior TAC and one with pulmonary metastases.

Conclusions: Our results are consistent with the literature. PET/CT has emerged as an important part of the standard work-up of patients with oesophageal cancer besides its important ability to detect unsuspected metastatic disease. Further studies to evaluate the real role of PET in RT planning for the delimitation of RT volumes are needed.

CHEMORADIOTHERAPY IN CARCINOMA OF THE ANAL CANAL: OUR EXPERIENCE

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Objectives and purpose: Primary end-points: evaluation of acute toxicity, compliance with radiotherapy and chemotherapy, pathological complete response. Secondary end-points: report local control and distant relapse.

Methods: Between 2006-2014 a retrospective analysis has been conducted on 11 patients with squamous cell carcinoma of the anal canal who received curative treatment with chemoradiotherapy. The treatment consisted of 3-dimensional conformal external beam radiotherapy or intensitive modulated radiotherapy (45 Gy to the whole pelvic target and a boost of 10-15 Gy to the primary tumor) with concurrent chemotherapy (5-fluorouracil and mytomycin C or capecitebine).

Results: There were 10 patients (6 males and 4 females). Median age at diagnosis was 66 (range 42-88). Pre-treatment stage were: II in 4/10 patients, IIIA in 2/10 patients and IIIB in 4/10 patients. All of them completed radiotherapy. The most acute side-effect of the treatment was radiodermatitis (grade 3 in 4 patients). 4 patients had complete clinical response desmotrated by RMN y biopsia. 2 patients underwent radical salvage Abdominoperineal Resection for persistent disease and 1 patients for recurrent disease who had pathologic response. 2 patients had died (one because of disease progression and other for cardiogenic shock after surgery). 4 patients were alive without evidence of recurrent disease, 1 had disease progression and 3 patients was lost to follow-up. 2 patients had a local relapse and 2 had distant relapse.

Conclusions: Our data provides that chemoradiotherapy for anal cancer is safe and well tolerated with benefits in disease control, rates of cure and pathological complete response.

CLINICAL EXPERIENCE AND PROBLEMS WITH NEOADYUVANT TREATMENT OF RECTAL CANCER

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Aim: The aim of this study is to report our clinical experience and results of patients with locally advanced rectal cancer treated with neoadjuvant chemoradiotherapy based on 5-Fluorouracil or capecitabine in 2013 and 2014.

Background: Capecitabine has been compared with 5- FU for neoadyuvant treatment of rectal cancer, showing no significant differences in the pathologic response, local and distant recurrence, or overall survival among patients treated with preoperative RT and concurrent capecitabine compared with those treated with RT and concurrent 5-FU. Due to the law rate of complete pathological regression with capecitabine, we are starting to use continuous infusion of 5-FU.

Methods: From April 2013 to December 2014 a total of 61 patients with locally advanced rectal cancer have been treated. Out of this patients, 26 were treated with Capecitabine and 17 with 5-FU before surgery. We have analyzed the pathologic response in terms of complete regression (GR1), fibrosis with scattered tumor cells (GR2), fibrosis and tumor cells with preponderance of fibrosis (GR3), and fibrosis and tumor cells with preponderance of tumor cells (GR4).

Results: The pathologic complete response rate was 11.5% with capecitabine and 29.4% with continuous infusion 5-FU. Respectively we have had GR2 26.9% vs. 29.4%, GR3 15.3% vs. 29.4% and GR4 46.1 vs. 11.7%.

Conclusions: In our centre we have the perception of better pathological responses with continuous infusion of 5-FU and so we are taking it as the first choice of treatment. Moreover, we need to further analyze the reason of why this may be happening.

EPIDERMOLYSIS BULLOSA AND RADIOTHERAPY

Rubí Olea, L.; Alonso Martínez, P.; Sandoval Cuadrado, M.P.; Pérez García, E.J.; teruelo Sanz, C.; Cuadillero Martín, F.; Sánchez Belda, M.; Diezhandino García, P.; Sanmamed Salgado, N.; López-Lara Martín, F.

Introduction: Epidermolysis bullosa (EB) is a rare congenital blistering disorder defined by high skin fragility and impaired wound healing. Recessive dystrophic EB (RDEB) is the most severe type of EB, and squamous cell carcinoma (SCC) is by far the most feared complication in RDEB, while epidemiological data warn about the risk that these patients suffer from other tumors, as our case, rectal adenocarcinoma.

Material and methods: 46 year old woman diagnosed with EB consulting for hematochezia. In MRI appears tumor pelvic extended 8 cm from the anal margin and superiorly 6 cm, invades the mesorrectal fat, without uterus invading and there are 2-3 unspecific small lymph nodes. Received 50.4 Gy with IMRT and concomitant 5-FU.

Results: During radiotherapy the patient starts with worsening gluteal chronic lesion presented by their disease. Daily cures with cicatrizant materials and infection control of the lesion was necessary. It was not required to stop treatment, we had a stabilization of lesions during the radiotherapy and a slowly improved after completion of treatment. Tolerance to chemotherapy was excellent. The surgical tumour dissection had multiple complications, she could not receive adjuvant chemotherapy. At present patient is on monitoring, there is not recurrence and the skin is restored.

Conclusions: We have very little information of the effects of radiotherapy in patients EB diagnosed. Radiation doses published vary between 12 and 60 Gy (mean 40 Gy). EB patients have a severe acute cutaneous side-effects and need more control but should not be denied for oncologic treatment. We need more studies on the oncologic treatment in these patients.

EXPERIENCE IN ESOPHAGEAL CANCER AND ANALYSIS

Vázquez Hueso, M.V.; Acuña Mora, M.; Pérez Martín, M.M.

Introduction: Esophageal cancer has a low survival despite treatment. Our goal is to analyze the epidemiological, clinical and therapeutic data of 14 patients diagnosed with esophageal cancer since 2009.

Results: Ten patients were male; 83% with a history of smoking and 58% of drinker. All cases except one, had squamous histology, 58% being located in the middle third, 25% in distal and 16% in proximal. The TNM diagnosis was T3-4 N0-1, except 3 patients with stage IV (excluded from the analysis). Two patients received preoperative radiochemotherapy treatment with 45 Gy; the remainder (9), radical radiochemotherapy treatment, with a mean dose of 55 Gy; with standard fractionation and 3D planning. The 2 patients with preoperative treatment had toxicity and 80% of radical; being the major side effects, esophagitis grade I-II and dysphagia to solids, causing weight loss and requiring nutritional supplements; also dermatitis grade I-II was observed in 3 patients, grade II dysphonia and mild asthenia one another. Estimated at 1.5 year survival was 57%. Currently five have died, 4 by progression and 1 otherwise; None of toxicity.

Conclusion: Epidemiological data, treatments performed and recorded side effects are consistent with those described in the literature. Survival is also similar, even assuming the bias by the small number of patients.

HIGH DOSE NEOADYUVANT RADIOCHEMOTHERAPY IN POOR-RISK RECTAL CANCER

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Purpose: To evaluate high-dose neoadyuvant radiochemotherapy (RCT) followed by surgery in MRI and EUS-Defined Poor-Risk rectal cancer.

Materials: Between February 2004 and June 2014, 88 elegible patients were recruited. The critera for poor-risk rectal cancer were tumours with circunferencial resection margin threatened, T4 tumours, and N2 tumours. Patients received high dose neoadyuvant radiotherapy with a median dose of 59.4 Gy with a concomitant fluoropyrimidine based chemotherapy. Surgery was planned 6-8 weeks after CRT. The primary objective was local control; secondary objectives were resection (R) status, pathologic response, overall survival (OS), metastasic progression free survival (MPFS) and toxicity.

Results: At a median follow-up of 34 months (7.5-106.8), local control rate at 1, 3 and 5 years were 94%, 82.5% and 76.5% respectively. Eighty-three patients (94.3%) proceeded to surgery. 73 patients had R0 resection, 7 patients had R1 resection and 3 patients had R2 resection. Five patients remained inoperable. Pathologic complete response (pCR) was observed in 13 patients (14.8%) and in additional 52 patients had downstaging (59%). The MPFS after 1 and 3 years were 86% and 52%. The OS at 1, 3 and 5-years were 94%, 63% and 46% respectively. Adjuvant chemotherapy was not associated with a significantly improvement of OS in good responders (pCR, pT0-2). Three grade 3 toxicity were related. Main grade 1 toxicities were proctitis (34%), diarrhea (30%), and anemia (30%).

Conclusions: High dose neoadyuvant radiochemotherapy in poor-risk rectal cancer is associated with improved tumor resectability and allow to increase the local control without an increase in acute toxicity.

IMPACT OF CONCOMITANT BOOST RADIOTHERAPY IN LOCALLY ADVANCED RECTAL CANCER

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Objectives and purposes: The aim of this study is to analyze the correlation between escalation dose radiotherapy, pathological complete response, downstaging and secondary toxicity on preoperative rectal cancer treatment.

Material and methods: 269 patients had been treated in our hospital during the period of time 2000-2013. 226 patients (mean age 67 years; male: female 2/1; 67% T3 N0-3; 7.8% T4 N 0-3) received the standard schedule of chemoradiation (45-50.4 Gy; 1.8 Gy/fraction). 43 patients (mean age 66 years; male: female 1.7/1; 46.15% T3 N0-3; 23.07% T4 N 0-3) underwent an accelerated fractionated radiotherapy (45 Gy to the pelvis volume with an integrated 2.17 Gy boost on the tumor). The efficacy of the dose escalation in terms of pathological tumor response and toxicity were evaluated as main end-points.

Results: Dose escalation radiotherapy treatment report us a higher rate of complete pathological clinical response (21% vs 10.7%) and a lower rate of not treatment response (23.25% vs 29.33%). Therefore acute G2 toxicity is higher (46.34% vs 28.63%) but well controlated and the end of treatment on time. No G3 toxicity was seen.

Conclusions: This schedule of treatment results in high pCR-rates and acceptable early toxicity. In despite of these we need further investigation to know the differences on time of relapse between the two cohorts of patients and increase the follow up.

IMPACT OF RADIOTHERAPY BOOST IN LOCALLY ADVANCED RECTAL CANCER

Jimenez-Jimenez, E.; Mateos, P.; Pardo, J.; Montemuiño, S.; Ortiz, I.; Aymar, N.; Alastuey, I.; Mena, A.; Font, J.C.; Sabater, S.

Purpose: Neoadjuvant radiotherapy (RT) is standard treatment in locally advanced rectal cancer. Doses between 45 Gy-50.4 Gy are commonly used. Studies suggest that dose increase correlates with a pathological complete response. However, organs at risk (OAR) limit dose escalation. Our aim was to compare two RT schemes and evaluate the toxicity profile using dose volume histogram (DVH) data.

Material and methods: We evaluated 16 patients with rectal cancer in prone position. For each patient, 2 dose-plans were calculated (scheme 1: 45 Gy and scheme 2: 50.4 Gy). For each scheme, bladder, femoral head and neck, small and large bowel (individual loops), bowel bag doses and DVH metrics (V45, V50, maximum and mean dose of all OARs and V150 and V195 of small/large bowel and bowel bag) were recorded.

Results: Only small differences between schemes were observed, with respect to V45, V50 and volumetric measurements. Regarding mean dose received for small bowel, for large bowel and for bowel bag no significant differences were found. However, large maximum dose values were observed with scheme 2. Bladder was the OAR that most increased the dose absorbed with scheme 2, especially considering maximum dose (probably because of its proximity to boost area).

Conclusions: Both schemes respected OARs dose-constraints with similar DVH-metrics to OARs. Because DVH-data of small bowel and bowel bag are very similar we recommend contouring bowel bag due to the rapidity. Regarding bladder, the increment of dose absorbed is compensated by its radioresistence. We recommend dose escalation in the neoadjuvant setting.

IMRT VS 3D-CRT IN ADJUVANT RADIOTHEAPY FOR UPPER GI NEOPLASM

Díaz Gómez, L.; Ureña Llinares, A.; Seguro Fernández, A.

Purpose and objective: Adjuvant therapy for upper abdominal malignancies remains a standard of care for patients who have undergone surgical resection. One of the major challenges of administering radiation to this localization is the presence of multiple organs at risk (OAR) including liver, kidney, spinal cord... To assess the potential advantage of intensity modulated radiotherapy (IMRT) over 3D conformal radiotherapy (3D-CRT) is the aim of this study.

Materials and methods: Volumes were delineated on 11 patients. The 3DCRT technique involved two lateral fields and one or two obliques, with different table angles to avoid most volume of the kidneys. IMRT technique involved several multi-field coplanar inverse planning. The prescription dose was 45 Gy in 25 fractions. Dose-volume histograms, dose homogeneity and dose to OAR were evaluated.

Results: IMRT was superior to 3DCRT with improvements in reducing the volume of both kidneys in the low dose region (V15) and liver as well (V30), achieving a lower spinal cord maximun dose. This can be explained by more number of the beams used in the IMRT technique. However, there were no significant improvements in planning target volumen (PTV) coverage. Both techniques are adequate with good coverage in the V95 with no evident differences in PTV dose homogeneity.

Conclusions: IMRT is associated with a decrease in dose delivered to OAR without improving PTV coverages for upper GI malignancies.

INTENSITY-MODULATED VERSUS CONVENTIONAL CHEMORADIATION THERAPY IN LOCALLY ADVANCED RECTAL CANCER

Marcos, F.J.; Del Cerro, E.; Couñago, F.; Díaz, A.; González, F.; Juzgado, D.; Castro, J.

To compare resective surgery and Modulated Intensity (IMRT) versus conventional radiotherapy (CRT) in the model of neoadjuvant/postoperative treatment for rectal cancer. From 12/08 to 12/13, 75 consecutive patients were included: 38 were treated with IMRT (postoperative radiation 10.5%) and 37 with CRT (8.1% postoperative). Age ranged from 26-83 (median 61). Distance to anal margin were: 1-5 cm (13 vs 8 p), 6-10 cm (14 vs 11 p) and >10 cm (11 vs 18 p). Patients received 45 Gy to the pelvis (97.3 vs 100%) with boost to macroscopic disease (84.2 vs 56%), and concurrent standard dose capecitabine (36.1 vs 35.2%) and oxaliplatin (63.9 vs 64.7%). There was no grade 4 toxicity. Grade 3 toxicity rate was 15.7 vs 24.3%: diarrhea (7.8 vs 10.8%), proctitis (5.2 vs 5.4%), cystitis (0 vs 2.7%) and dermatitis (2.7 vs 8.1%). All were resected: 93.1 vs 77.4% low/ultra-low anterior resection and 6.9 vs 22.6% abdominoperineal procedures. Laparoscopic surgery was achieved in 96%. Margings were free from tumor involvement in 98.2% specimens. Postoperative complications were observed in 28.9 vs 32.4%: scar infection 10.5 vs 18.9%, seroma 7.9 vs 8.1%, dehiscences 7.9 vs 8.1%, urinary obstruction 2.6 vs 2.7%, pseudo-occlusive symptoms 5.2 vs 8.1%. Perioperative mortality was 2.6%. Hospital discharge ranged from 2-28 days (median 6 vs 8). Tumor downstaging was achieved in 61.5 vs 56.5%, node down-

staging in 53.8 vs 39.1%, pathologic complete response (ypT0N0) in 40.4%. Integration of IMRT for locally advanced rectal cancer, is feasible, safe, and may improve further the clinical and economic progress of cancer surgery approach.

IORT FOR LOCALLY ADVANCED PRIMARY AND RECURRENT COLORECTAL CANCER

Candini, D.; Hervás, A.; Fernández, E.; Martínez, J.; López, F.; Ramos, A.

Objective: To evaluate the role of intraoperative radiation therapy (IORT) during radical or macroscopical resection of locally advanced colorectal cancer (CRC).

Materials and methods: From March 2007 to December 2014, 29 patients with pathologically confirmed CRC (22 rectal and 7 locally advanced primary and recurrent colon cancers) were treated with IORT in our operating room with a multidisciplinary team. We analyzed factors associated with postoperative morbility, local control (LC), overall survival (OS) and disease free survival (DFS).

Results: IORT was delivered using high-dose-rate electron beam radiotherapy (median dose 16 Gy y median energy 7.1 MeV). Gender: male 48%, female 52%. Median age was 66 years (range 42-88 years). Staging of the cancer was: 14% M1, 76% N+ and 59% T4. 38% received IORT for recurrent tumors, 42% for T4 staging and 20% for positive circunferencial resection margin. R0 resection rate was 70%. 16 patients (55%) underwent external beam radiation therapy (EBRT) before IORT. Local recurrence was 10.4%, distance recurrence was 38%. Local and distance recurrence was 7%. With a median of follow-up of 35 months (range 1-93), OS at 1 and 2 years was of 83% and 68% respectively. The DFS at 1 and 2 years was 77% and 59%. Two-year LC was 87%, for primary and 45%, for recurrent tumors, respectively. Treatment was well tolerated presenting no acute or chronic toxicity G3.

Conclusions: IORT improves local control for locally advanced and recurrent colorectal cancer. In general, IORT is safe and feasible.

IS IT NECESSARY TO INCLUDE THE EXTERNAL ILIAC ON RECTAL CANCER RADIOTHERAPY?

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Introduction and objectives: In radiotherapy of rectal carcinoma, know the predominant areas of recurrence is important to define the clinical volume. Interested in the possibility of not including external iliac nodal territory in treatment planning, we analyzed the incidence of relapses, and their distribution in patients with T4 rectal tumors treated with surgery plus chemoradiotherapy and in the planning of radiotherapy did not include external iliac chains.

Patients and methods: We treat 28 patients with T4 rectal cancer between 2008 and 2011. We determined the number of relapses and location. Multivariate analysis was comparing the group of recurrence vs no recurrence to detect other risk factors.

Results: Median follow-up: 45.8 months. Overall incidence of recurrence: 50%. Distant recurrence: 25%. Local recurrences: 14.3%. Two nodal recurrences detected (7.1%), one in the iliac-inguinal region and other retroperitoneal. The incidence of nodal recurrence Iliac was rare (3.57%). In the subgroup analysis it is observed that most relapses occurred in patients with tumor in distal rectum (0%>10 cm, 42.86%>5-10 cm, 57.14%≤5 cm). Moreover also shown that 100% of patients with histological grade III relapsed compared to 16.7% of Grade I. The two patients with lymphovascular invasion (7.1%) relapsed. In the remaining variables did not differ.

Conclusions: Our data suggest that not to include external iliac chains in the treatment volume does not increase the risk of nodal recurrence. The distance from the anal verge and histologic grade were risk factors for recurrence. Prospective studies are needed with larger sample to corroborate our results.

LIMITING THE DOSE TO THE ANAL SPHINCTER CAN IMPROVE SPHINCTER FUNCTION IN LARC

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Background: The objective of the study is to determine the correlations among the variables of dose and the sphincter function (SF) in patients with locally advanced rectal cancer treated with preoperative capecitabine/radiotherapy followed by Local Anterior Resection(LAR) +TME.

Methods: We have retrospectively reviewed 92 consecutive patients with LARC treated at our center with LAR from 2006 and more than 1 year free from disease. We re-contoured the anal sphincters (AS) of patients with the help of the radiologist. SF was assessed by Werner´s test (0-20 points, being punctuation inversely proportional to SF). All questionnaires were filled between January 2010 and December 2012. Dosimetric parameters that have been studied include: V20, V30, V40, V50, median dose (Dmean), mínimum dose (Dmin), D90 (dose to the 90% of sphincter) and D98 The study was approved by Ethical Committee of Navarre and all patient signed the IC before entering the study. Statistical analysis: the correlations among the variables of dose and SF were studied by the Spearman correlation coefficient. Differences in SF related to maximum doses to the sphincter were assesed by the Mann-Whitney test.

Results: Dmean had the most statically significant relation with SF measured by Werner´s test, with a Spearman correlation coefficient r=0.19 (p=0.036). Patients receiving doses of radiation to the AS under 20 Gy showed a significantly better SF (p=0.008).

Conclusions: In order to improve the SF, the maximum dose of radiation to the AS should be limited, when possible, to <20 Gy.

LOCALLY ADVANCED UNRESECTABLE PANCREATIC CANCER (LAUPC). IS THERE A ROLE FOR RADIATION?

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Purpose: We analyzed retrospectively prognostic factors as well as outcome in patients diagnosed with LAUPC, treated with chemotherapy alone (C), concurrent chemoradiation therapy (CRT), induction C followed by concurrent chemoradiation (C-CRT), CRT followed by chemotherapy (CRT-C), or C-CRT followed by C (C-CRT-C).

Patients and methods: 82 patients (38 women and 44 men) with a mean age of 61.8 years (38-81) diagnosed with LAUPC between 1/19/2000 and 5/11/2012 were analyzed. Exclusion criteria included patients with metastatic disease at diagnosis and patients who underwent a surgical resection. All patients were initially evaluated by a pancreatic surgeon to determine resectability. Tumor locations include the head (71%), body (18%), and other (11%) sites of the pancreas. The majority of the patients (n=78) received Gemcitabine based-chemotherapy. For patients receiving radiation therapy, the median radiation dose was 5,000 cGy. All but one patient had a KPS above 70. Primary endpoints were median survival time (MST), time to local progression (TTLP), time to local regional progression (TTLRP) and time to distant progression (TTDP) calculated from the time of diagno-

sis. Baseline patient characteristics regarding age, race, gender, performance status, smoking history, initial CA 19-9 and tumor characteristics were also included in the analyses.

Results: Median follow-up for all patients was 12 months (9-15). No significant factors were noted in terms of patient baseline characteristics to be prognostic for MST, but African-Americans had lower TTDP compared to whites, 4 (1-9) vs. 9 (7-11) months (p=0.02). The following table demonstrates the outcomes with respect to primary endpoints (in months) for each treatment group. All CRT arms had improved outcomes over C alone.

Conclusions: In our single institutional experience, the addition of chemoradiation significantly improved MST, TTLP, and TTLRP compared to chemotherapy alone. The CRT-C sequence demonstrated superior outcomes in regards to MST and TTLRP. However, given the limited number of patients and various chemotherapy agents used; further investigation is needed in determining the most appropriate treatment regimen in patients diagnosed with LAUPC.

LOCATION OF RECTAL TUMOR COMPARING THE CLINICAL-RADIOLOGICAL FINDINGS

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Objectives: In rectal cancer, the location of the tumor, assessed by different imaging modalities, may not be equivalent. Our goal was to compare the different tests and digital rectal examination (DRE) and assess the degree of agreement between them.

Material and methods: We reviewed imaging and planning data of 30 patients with locally advanced rectal cancer. DRE was performed by the same team of surgeons. Colonoscopy and MRI were reported by gastroenterologists and radiologists. The tumors were divided into subgroups according to their distance from the anal margin: high, medium and low tumors. The significant differences were evaluated by the Wilcoxon signed-rank test.

Results: CT-MRI concordance according to distance from anus was analyzed. Most of cases this distance differs and only in 10% of cases both distances are similar. However, values are close, and 50% of cases CT and MRI only differ less than 2 cm. When patients were further divided into subgroups according to distance from anus, a greater concordance was found for low tumors (mean difference: 1.3 cm) than higher tumors (mean difference 4.9 cm). A high correlation between DRE and colonoscopy was observed. Differences were larger between DRE and planning CT and between DRE and MRI.

Conclusions: Location of the rectal tumor according different clinical-radiological tests usually does not agree. However, the more distal rectal tumors are where clinical and radiological measurements are more consistent. In the future, RT based on MRI which offers better soft tissue visualization could solve this problem.

MANAGEMENT AND OUTCOMES IN LOCALLY ADVANCED ESOPHAGEAL CARCINOMA

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Objetive: We report our single institutional experience of treatment with trimodality therapy or definitive radiochemoterapy.

Materials and methods: Records of 108 patients with LAEC treated between January 2005 and December 2013 in our Hospital were retrospectively reviewed. The average age was 63 years, most patients were male (88%). Tumor sites were Ce/Ut/Mt/Lt in 4/21/54/29 cases. 86.1% of patients had squamous cell carcinoma. 99 patients were stage III and 9 stage II. 3DRDT total dose was 45-50 Gy 80.5% CT regimen was Al-Sarraf.

Results: Median follow-up was 18.13 months. 66.6% were treated with RCT and 33.3% with RCT followed by surgery. After RCT only 9% had grade >3 toxicity and 84.25% showed clinical improvement. 67.6% had radiological response. We reported 27.7% phatological complete responses. Average overall survival was 16.3 months and 2-5 year overall survival was 24% and 12% respectively. Patients who underwent preoperative RCT had 2 and 5 year survivals of 44% and 21% compared to 15% and 8% for definitive RCT (p<0.0001). Cox regression analysis was used to determine prognostic factors for OS. The outcome was significantly better in female, downstaging and intention of treatment. Induction chemotherapy, committee submission and chemotherapy regimen did not influence survival.

Conclusions: In selected patients trimodality therapy has proved to be a good treatment option. It improved survival over RCT alone, as a probably consecuence of having patients with unresectable tumor and more comorbidities in no surgery group. Further investigation is required to identify patients for whom definitive chemorradiation may be an effective option.

NEOADJUVANT CHEMORADIOTHERAPY IN BORDERLINE RESECTABLE PANCREATIC CARCINOMA: A SINGLE-INSTITUTION EXPERIENCE

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Purpose: Neoadjuvant protocols with chemoradiotherapy might improve response rates and allow a margin-free R0 resection, which could improve long-term survival rates. The purpose is evaluate the efficacy and toxicity of neoadyuvant Gemcitabine-based combined with chemoradiotherapy.

Material and methods: Patients with borderline resectable pancreatic carcinoma according to the "AHPBA-SSO-SSAT-criteria" between 02/2008 -12/2014 were identified. They received 2 cycles gemcitabine-oxaliplatin followed by chemoradiotherapy: weekly gemcitabine; 45 Gy of external-beam radiotherapy followed by 5 Gy tumour boost. Staging-CT after neoadjuvant chemotherapy and after chemoradiotherapy was done. If feasible, surgery was performed 4-6 weeks after the end of protocol.

Results: 19 patients (ECOG-PS 0-1). Mean age 56.4 years (38-71): 42% males and 58% females. 68% needed pretreatment biliary drainage. During neoadyuvant chemotherapy 2 p (10%) progressed systemically, the remaining 17 (90%) finalized the complete protocol. Grade 3-4 toxicity observed: fatigue (18%), diarrhoea (12%), abdominal pain (12%), neutropenia (12%). Radiological response: 41% partial response, 47% stable disease, 12% progressive disease. In 12 p (71%) surgical exploration was performed: 50% complete resection (cephalic duodenopancreatectomy, 42% and corporo-caudal resection 8%) with R0 resections; 33% only palliative derivative procedure and in 17% no surgical act was performed. In 5 p surgery was not possible because unresectability or liver/peritoneal progression. Median follow-up of 11 months (range 6-67). Median overall survival (OS) of 11 months (range 4.7-17.2). OS according to surgical resection: resection vs no resection, 14 vs 9 months, p 0.08.

Conclusions: The use of neoadjuvant chemoradiotherapy is feasible in patients with defined borderline resectable pancreatic cancer. It can identify a subgroup of patients who can benefit from a radical surgical procedure with clear margins.

NEOADJUVANT CHEMORADIOTHERAPY IN ESOPHAGEAL CANCER: INICIAL EXPERIENCE WITH CROSS TRIAL

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Introduction: Preoperative chemoradiotherapy with carboplatin-paclitaxel has become the new standard in resectable esophageal cancer.

Objective: To describe the initial experience of a single institution with the CROSS trial protocol (N Engl J Med. 2012;366:2074) in terms of local control, survival and acute toxicity.

Materials and methods: We retrospectively analyzed 16 patients with resectable esophageal or esophagogastric-junction cancer treated between 2012 and 2014. The mean age was 64.5 years. There were 13 male and 3 females. Histology was esophageal adenocarcinoma in 12 patients, squamous cell carcinoma in 3 patients and poorly differenciated in one patient. The patients were treated with weekly administration of paclitaxel (50 mg/sqm) and carboplatin (2AUC) for 5 weeks with concurrent external radiotherapy, mean dose of 41.4 Gys (1.8 Gy/fraction), followed by surgery. Statistical analysis: Kaplan-Meier method and Chi-square test.

Results: Response: Eight out of 13 (61%) evaluable patients had downstaging, three of those (23%), had a pathologically complete response. One patient had a local relapse and three patients suffered distant metastasis, leading to two years probability of distant metastasis of 36%. Two year actuarial overall survival was 58%. Acute toxicity: No grade 4 was seen. Haematological toxicity was the most frequent. Seven patients (37%) had grade 3 toxicity: 6 leukopenia, 1 neutropenia, 1 esophagitis, 3 dysphagia, 1 nausea-vomiting. Minor toxicity (grade 1-2) was present in all patients.

Conclusions: Neoadjuvant chemoradiotherapy with carboplatin-plaquitaxel offers excellent rates of pathological responses and survival with tolerable toxicity. Our results confirm the new paradigm in the treatment of resectable esophageal cancer.

NEOADJUVANT CHEMORADIOTHERAPY IN UNRESECTABLE PANCREATIC CANCER

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Introduction and purpose: The role of preoperative chemoradiotherapy in unresectable pancreatic cancer, since the only chance of cure for these patients is complete resection of the tumor.

Methods: From May 2012 to May 2013 were selected a total of 11 patients with unresectable disease at our institution according to the criteria of MDA. All received neoadjuvant chemotherapy with gemcitabine and IMRT with up to 50.4 Gy [30.6-50.4]. Three had previously received QT with FOLFIRINOX or gemcitabine-Abraxane.

Results: All patients ECOG 0-1, the age range of 55-75 years. Seven tumors were located in the pancreatic head, and four in the body-tail. Resection was achieved in 36% of patients and responses in the surgical specimen showed a percentage of viable tumor estimated 10-20%. One patient achieved complete pathological response. At the date of our analysis of patients had 36.36% distant metastases, 27.27% patient had a mixed (local and distant) pattern of failure and one local relapse. Two patients died for treatment sequelae and five for progression of the disease. Median survival was 15 months. We reported 70% of emesis controlled by medical treatment, and 53% of the patients do not received all concomitant chemotherapy.

Conclusion: IMRT/IGRT in combination with chemotherapy seems to be a good treatment choice in pancreatic cancer that can potentially collaborate with resection in a limited number of patients with an acceptable toxicity index.

NEOADJUVANT RADIOCHEMOTHERAPY (NRCT) IN ESOPHAGEAL CANCER: A RETROSPECTIVE STUDY

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Purpose: To evaluate retrospectively the impact of NRCT on pathologic response and overall survival after esophageal resection.

Material and methods: From January-2009 to October-2014, 30pwith a mean age of 69.5 years (range 50-88) were included: 10 p stage IIB, 13 p stage IIIA, 5p stage IIIB, 2 p stage IIIC. A total radiation dose of 50.4 Gy was given in 28 fractions, 5 days/week, plus weekly concurrent carboplatin/paclitaxelfollowed by surgery after 4 to 6 weeks. Twenty patients received chemotherapy prior to NRCT. PET-CT was used for RT planning in all cases. Fifteen patients were treated with 3D techniques and 15p with IMRT. Treatment was delivered with IGRT in all cases.

Results: With a median follow-up of 15.5 months (range 4-70), pathological complete response was observed in 30%, downstaging in 50%, stable disease in 17% and progressive disease in 3%. One and 2 year actuarial overall survival was 83% and 68.5% respectively; 1 and 2 year actuarial cause-specific survival was 86% and 71% respectively. 22% died from recurrent disease. On univariate analysis, patients with stage IIB have significant better outcomes in terms of overall survival (OS) and cause-specific survival (CSS) (p=0.035). 86,7% of patients treated with 3D showed toxicity attributable to treatment compared with 33% of those treated with IMRT (p=0.003). Chemotherapy prior NCRT showed no benefit in OS and CSS (p=0.542).

Conclusions: Our results showed that NRCT with IGRT-guided IMRT is an effective alternative for treatment of EC.

NEOADJUVANT-RADIOTHERAPY IN RECTAL CANCER WITH INTEGRATED BOOST TUMOR: EXPERIENCE 2012-2014

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Introduction: Neoadjuvant radiotherapy with concomitant chemotherapy is the treatment of choice for rectal adenocarcinoma advanced stage. The administered doses ranging from 45-50 Gy.

Material and methods: We reviewed patients treated with pelvic radiotherapy with 45 Gy boost tumor composed of 50 Gy, concomitant with chemotherapy. We have analyzed 76 patients who were treated between enero 2012-diciembre 2014.

Results: Of the 58 patients who know AP, the result has been reaching.

Conclusions: Our data demonstrate that the integrated boost chemo-radiotherapic treatment with neoadjuvant intention in locally advanced rectal cancer values achieved after pathological responses similar to those published in the literature and with an acceptable tolerance surgery. However, we should ask ourselves a dose escalation or increased time until surgery to become complete responses early stages.

OUTCOMES IN LOCALLY ADVANCED ESOPHAGEAL CANCER TREATED WITH RADIOCHEMOTHERAPY

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Purpose: To asses the outcomes of patients (pts.) diagnosed with locally advanced esophageal cancer treated with radiochemotherapy (RTC).

Materials and methods: retrospective cohort study. 30 pts with mean age of 64.97 years (42-82) diagnosed with esophageal cancer. Clinical stage: II (46.7%), III (53.4%). Histologies were adenocarcinoma (66.7%) and squamous cell carcinoma (27.8%). Location: lower third (46.7%), gastroesophageal junction (23.3%), middle third (20%), upper third (6.7%) and cervical (3.3%). Initial symptoms: dysphagia (76.7%). PET-CT was performed at baseline in 90% of pts. Treated with RT, dose between 30 and 50.4 Gy (1.8 Gy/fraction). Treatment intent: neoadjuvant (66.7%), radical (23.3%) and adjuvant (10%). Cisplatin/5-FU and carboplatin/paclitaxel were the most frequently used chemotherapeutic schedules. After neoadjuvant treatment 46.7% of pts. underwent esophagectomy, more frequent esophagectomy with thoracic approach. Overall survival (OS), disease-free survival (DFS), cancer-specific survival (CSS) and toxicity were analyzed.

Results: median follow-up was 14.48 months. OS mean was 22.72 months (95%CI 14.97-30.49); CSS mean was 35.61 months (95%CI 23.39-47.84) and SLE mean was 34.4 months (95%CI 21.1-47.7). OS at 2 and 3 years: 30.1%, 15%; CSS 2 and 3 years: 54.1%, 36%; DFS at 2 and 3 years: 59.6%, 39.7%, respectively. Acute toxicity were grade III oesophagitis (30%), grade III asthenia (13.3%), grade II-IV hematologic and, late toxicity was esophageal stenosis (10%).

Conclusions: patients with locally advanced esophageal cancer have a poor prognosis. The results obtained are similar to those reported in the literature.

OUTCOMES IN LOCALLY ADVANCED RECTAL CANCER WITH NEODYUVANT TREATMENT STRATEGIES

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Objectives and purpose: This study reports outcomes of patients with locally advanced rectal cancer with preoperative chemoradiotherapy (CRT) followed by surgery. Primary end-point: evaluation of toxicity, compliance with CRT, downstaging, pathological complete response (RHC) and rate of sphincter preservation for distal cancers. Secondary end-point: report local control and distant relapse.

Methods: Single-centre retrospective study with clinical stage II-III rectal adenocarcinoma that received preoperative treatment with short-course radiotherapy (25 Gy in 5 daily fractions) or long-course (45-46 Gy in 25 fractions) with concomitant chemotherapy based in fluoropirimidines.

Results: Between 2004-2015, 275 patients (171 males, 104 females) were treated for rectal cancer. Median age: 71 years. All patients completed radiotherapy (19 short-course and 256 long-course). Only 2 patients had acute gastrointestinal toxicity grade 3. Median time of radiotherapy: 5 weeks. Median time to surgery: 8 weeks. Surgery was performed in 264 patients (88.2% R0 resection). 68.7% (189 of 264) achieved pathological downstaging. 14.8% (28 of 189) had pathologic complete response. In 110 patients the localization of tumor was in lower rectum. 25 patients had anterior resection –22.7%– allowing the preservation of anal sphincter. Median follow-up: 2.5 years. 40 patients (14.5%) had a local relapse. 56 (20.6%) had distant relapse.

Conclusions: Our study provides evidence that neoadyuvant treatment for rectal cancer was safe-well tolerated, with satisfactory local control and distant relapse rates while optimizing surgical outcomes with excellent rates of downstaging and RHC. Data on sphincter preservation for distal cancers were excellent.

OUTCOMES OF PREOPERATIVE RADIOCHEMOTHERAPY IN LOCALLY ADVANCED RECTAL CANCER

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Objective: To evaluate the outcome in terms of survival in patients (pts) diagnosed with locally advanced rectal cancer treated with preoperative radiochemotherapy (PRC) and total mesorectal excision surgery (MRS).

Material and methods: Retrospective cohort study. From 2002 to 2013 we analyze 194 pts (141 men vs 53 women). Age mean: 63.57 (26-84) years. Stage: II (30.4% pts), III (69.1% pts) and IVA (0.5% pts). Pts treated to a total dose of 50.4 Gy with a fraccionation of 1.8 Gy/day and concomitant fluoropyrimidine-based chemotherapy followed by MRS: low anterior resection (54.1%), ultralow anterior resection (5,7%), abdominoperineal resection (39.2%) and laparoscopy (0,5%). Pts were analysed in follow up for overall survival (OS), disease free survival (DFS), local relapse (LR) and pathological response (PR).

Results: Mean follow up: 3.96 years (0.3-11.3). OS mean: 8.49 years (IC95%: 7.77-9.21), actuarial at 3 and 5 years: 82.5% and 72.3% respectively. DFS global mean 8.30 years (IC95%: 7.58-9.03), actuarial at 3 and 5 years: 79.2% and 66.3%, respectively. LR: 17 pts (8.8%). PR: complete (18.1%), partial (54.1%), stabilized (21.6%), and progression (5.2%).

Conclusions: In our experience, the results in terms of survival and pathological response in pts with locally advanced rectal cancer treated with PRC and MRS are similar to published so far in the literature.

PELVIC RADIOTHERAPY IN RECTAL CANCER WITH ULCERATIVE COLITIS

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Objective: Many radiation oncologists are reluctance to administer radiotherapy to patients with Inflammatory bowel disease (IBD) because the tolerance of pelvic irradiation is unknown. Furthermore, treatment with preoperative short-course radiation is not common.

Materials and methods: We present a 69-year-old man with persecutory delusional disorder and 9-year history of ulcerative colitis, treated with external beam pelvic radiotherapy (PRT) for rectal cancer (cT3N0M0). He received a total dose of 25 Gy over 5 days, because of his psychiatric illness. We used conformational techniques to minimize the volume of small bowel within the fields and proctitis zone was contouring as organ at risk.

Results: He underwent terminal protocolectomy with permeant ileostomy. Pathological diagnosis revealed a signet-ring cell carcinoma, stage IIIC (ypT4N2b). He received adjuvant chemotherapy (CT). One year and a half of follow-up, no chronic toxicities registered.

Conclusions: IBD (ulcerative colitis and Crohn's disease) have a greater proportion of high-grade tumors contributing to a worse prognosis, so adjuvant treatment should be aggressive. Adjuvant radiotherapy is associated with decreased rates of local recurrence of rectal cancer. Studies show toxicity incidence of PRT is acceptable and the risk of complications is lower than commonly perceived. Concomitant CT is associated with inci-

dence of acute complications, while chronic toxicity is related to the volume of small bowel within the radiation field. Use of modern conformational techniques can significantly reduce the incidence of treatment-related toxicity. Therefore, IBD's patients should not be routinely considered as a contraindication to PRT.

POST-NEOADJUVANT PRESACRAL EVOLUTIVE RADIOLOGICAL ABNORMALITIES IN RECTAL CANCER: LONG-TERM RISK FACTORS ANALYSIS

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Purpose: Radiological abnormalities in the presacral area (RAPA) after neoadjuvant treatment for locally advanced rectal cancer (LARC) are complex to interpret in terms of clinical and pronostic implications. Long-term radiological changes in the posterior hemipelvis are analyzed in the context of potential risk factors for development. Computerized tomography (CT) observations are categorized to discriminate malignant versus non-malignant changes.

Materials and methods: From 04/95 to 12/10, 397 patients with LARC [cT3 (93%) and/or cN + (69%)] were treated with preoperative external pelvic irradiation (81%≥4500 cGy) concurrent to fluoropirimidine based chemotherapy, radical surgery (sphincter preserving 68%) and presacral electron irradiation boost (IeORT) (83%). Elective adjuvant chemotherapy was considered. IeORT common characteristic were: single dose 12.5 Gy (27%), electron energies 12 MeV (33%), applicator diameter 5/6 cm (65%), beveled end 45º (96%).

Results: With a median follow-up of 63 months, RAPA was documented in 48% of patients. Evolutive clinical and radiological subtypes were classified as presacral recurrence (4%), non-malignant mass (23%) or fibrotic linear scarring (20%). Overall survival at 5 and 10 years were 8%/0%, 68%/46% and 86%/77%, respectively. Features related to the development of RAPA were: abdominoperineal resection and anterior ultralow resection (p 0.010); postoperative complications involving infection, wound dehiscence and bleeding episodes (p=0.00); operation room time (p 0.00); and ypN+ specimens (p 0.016).

Conclusions: The development of post-neoadjuvant RAPA is a frequent and heterogeneous follow-up event. Risk factors identified are associated to pelvic surgical stress features and radioresistant cancer.

PREDICTIVE FACTORS FOR SURVIVAL OUTCOMES IN ANAL SQUAMOUS CELL CARCINOMA

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Background and purpose: Definitive chemoradiation is the standard management for anal squamous cell carcinoma (ASCC). We performed a retrospective analysis of a consecutive cohort of patients with anal cancer for treatment-related factors influencing recurrence-free survival (RFS), and overall survival (OS).

Patients and methods: All patients referred for primary radiotherapy in our centre from 2001 to 2014 with anal canal carcinoma without distant metastases were analysed (n=30). Treatment consisted of external radiotherapy with or without brachytherapy and with or without chemotherapy. Patients-tumour, and treatment-factors were tested for influence on RFS and OS using Kaplan Meier analysis.

Results: Median age was 61 years (range 35-83), the AJCC stage distribution was 46%, 50%, and 4% for stages II, III, and IV, respectively. HIV positive status was confirmed in 33% of the patients. 22 patients received a radiation dose ≥60 Gy and 8 patients 50.4 Gy. 66% of them were treated with standard chemotherapy (Mitomycin C and 5-FU or CDDP and 5-FU) and 34% without or with others chemotherapy lines. Only 4 patients were operated post-radiotherapy. With a median of follow-up of 49 months(range 9-153), The 2-year RFS and OS were 85% and 91% respectively, for doses ≥60 Gy and 60% and 72% for 50.4 Gy; without significant differences in outcomes. 26% of the analyzed patients relapsed: 75% were seropositive and 50% did not receive standard chemotherapy regimen.

Conclusions: This single-institution experience of definitive chemoradiation for ASCC using CRT demonstrates that outcomes are compromised by dose of treatment and chemotherapy regimen. Seropositive patients, treated with doses <60 Gy and without standard chemotherapy have more risks to relapse.

PREDICTIVE FACTORS IN NEOADJUVANT RADIOCHEMOTHERAPY FOR RECTAL CANCER

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Purpose: Pathologic complete response (pCR) to neoadjuvant treatment for rectal cancer improves local control and survival compared with non responders.Other factors, as perineural, venous, vascular invasion, and positive radial margin also worsen prognosis.Our objective is to assess the predictive factors for survival in our serie of 115 patients.

Material and method: Between January 2006 to december 2013, patients diagnosed of rectal adenocarcinoma received neoadjuvant radiochemotherapy. Surgery was performed after 6 weeks. Mandard classification was used to evaluate grade of pathologic response (TRG1-5). Log Rank test were used for univariate analysis and Cox regression for multivariant.

Results: Pathologic specimen showed: 16 TRG1, 43 TRG2, 39 TRG3, 17 TRG4. 11/115 patients had positive radial margin; 23/115 perineural invasion, 10/115 venous invasion and 14/115 patients small vessels invasion. In univariate analysis, distance to anal verge, radial margin, perineural invasion, venous invasion and good grade regression are predictive factors for survival, but only radial margin and perineural invasion in multivariant. In univariate analysis we could also find distance to anal verge ≤5 cm as the only predictive factor to find positive margin in the histologic specimen.

Conclusions: In our serie of patients, tumors located ≤5 cm from anal verge, are predictive to have positive margins in histologic specimen. Positive margin and perineural invasion are predictive factors for survival in the multivariate analysis.

PREDICTIVE FACTORS OF TUMOR RESPONSE AFTER NEOADYUVANT CHEMORADIATION FOR LOCALLY ADVANCED RECTAL CANCER

De la Pinta Alonso, C.; López Campos, F.; Fernández Lizarbe, E.; Ordóñez Zúñiga, D. J.; Martínez Ollero, J.; Hervás Morón, A.

Background and purpose: Neoadjuvant chemoradiation followed by surgery is the standard of care for locally advanced rectal cancer (LARC). The aim of this study is to identify predictive factors for tumour response.

Patients and methods: From 2000 to 2014, 243 patients with histologically proven LARC treated by preoperative chemora-

diation before total mesorectal excision were retrospectively studied. The radiation dose was 45-50.4 Gy with fluoropyrimidine-based chemotherapy regimens. Patients-tumour, and treatment-factors were tested for influence on tumour downstaging and regression grade using Mandard scoring system on surgical specimens (TRG).

Results: Median age was 67 years(range 33-85). Predominat stage of cancer were: 38% stage II and 56% stage IIIB. Tumour downstaging occurred in 167 patients (69%), including 48 patients (19.8%) with ypT0 (documented T0 at surgery and 166 patients (68.3%) with a satisfactory tumour regression grade defined as TRG1-3. Predictive factors for pathologic complete response (pCR) were identified: Planning Target Volume that receives 50,4 Gy (PTV50,4) and tumour localization; PTV50,4≤600 cc (p=0.049) and upper rectal tumours (p=0.004) were associated to higher pCR by univariate analysis.TRG1-3 was associated with intervals from chemoradiation to surgery by multivariate analysis (p=0.008); TRG1-3 rates were higher with longer intervals: 5,4% in ≤5 weeks, 43,4% in 6-8 weeks and 51,2% in ≥9 weeks.

Conclusions: PTV50.4 Gy and tumour localization were identified as predictive factors of pCR for LARC treated with preoperative chemoradiation. PTV50.4≤600 cc and upper rectal tumours are more likely to develop complete responses. Delay in surgery was identified as a favorable predictive factor for TRG1-3, Innovative strategies incorporating further time extension of the surgical interval can be safely explored.

RADICAL RADIO-CHEMOTHERAPY IN RECTAL CANCER: A CASE REPORT

Ortiz, I.; Jiménez, E.; Aymar, N.; Montemuiño, S.; Vidal, M.

Objective: We present a case of a patient with locally advanced rectal adenocarcinoma, medically inoperable because of medical conditions, that received radical radio-chemotherapy.

Materials and methods: A 73 year old male patient with hypertension, chronic obstructive pulmonary disease GOLD D and a 6 cm infrarenal aortic aneurysm with intramural thrombus, was diagnosed with rectal adenocarcinoma at 15 cm of the anal margin cTxN1-2M0 (stage III). Radical radio-chemotherapy was administered, giving a dose of 45 Gy in 25 fractions at the tumour, affected adenopathies, mesorectum and lymphatic areas, plus a boost dose of 14.4 Gy in 8 fractions excluding the lymphatic areas. The total dose was 59.4 Gy. The patient received concurrent chemotherapy (oral cabecitabine during a 6 months period). The tolerance for our treatment was excellent, showing only intestinal acute toxicity controlled by medical treatment. Follow-up evaluation was made using CT scanning and colonoscopy.

Results: In the medical evaluation performed 18 months after finishing radiotherapy and 12 months after finishing chemotherapy, CT scanning showed partial remission, concerning the tumour as well as the adenopathies, without any evidence of distant progression.

Conclusion: The gold standard treatment for locally advanced rectal adenocarcinoma is neoadjuvant therapy with concurrent radio-chemotherapy followed by surgery. In this case we show an alternative treatment option for inoperable patients, raising a higher total dose (59.4 Gy) with very good results concerning local control disease.

RADIOTHERAPY FOR LOCAL RECURRENCE IN PANCREATIC CANCER: CASE REPORT

Reyes, J.A.; Rodriguez, I.; Romero, A.; Montijano, M.; Mañas, A.

Background: Adenocarcinoma of pancreas is a highly lethal tumor. Worldwide, pancreatic cancer is the 8th cause of cancer deaths in men and the ninth in women. Surgical resection is the potentially curative treatment, however only 20 percent of patients are candidates for pancreatectomy because of the late presentation. The five-year survival following pancreaticoduodenectomy is only about 25-30 percent for node-negative and 10 percent for node-positive tumors. The prognosis is poor in the recurrence setting.

Case report: A 79 year-old woman was diagnosed in 2009 of pancreas adenocarcinoma. On November 2009 she underwent head pancreatectomy plus regional lymphadenectomy (pT3 pN0). Adjuvant chemotherapy based on gemcitabine was given. On March 2011 was observed an elevation of CA 19.9: 412 UI/ml. A PET/CT scan showed a small hypermetabolic lesion (1 cm) in the surgical bed, support viable tumor tissue, considered as a local recurrence. Chemotherapy based on gemcitabine was given for six months without response (CA 19.9: 1294 UI/ml). A 3D-CRT based on PET/CT scan planning was performed, total dose of 60 Gy was administered. There was a complete response in PET/CT scan and in the level of tumor marker. At 4 year of follow-up, the patient shows no evidence of recurrence.

Conclusion: Local recurrence after surgery for pancreatic cancer is a challenge for treatment. High precision radiotherapy technique based on functional imaging modality can be an option for improving local control. The local control achieved in this case could have impact into survival.

RECTAL CARCINOMA: COMPARISON OF 2 TECHNIQUES (3D CONFORMAL RT VS VMAT)

Morales, J.C.; Chinillach, N.; Soler, P.; Garcia, V.L.; Tortosa, R.; Andreu, F.J.

Objectives: To compare a 3DCRT technique with VMAT technique for neoadjuvant rectal cancer treatment.

Methods and materials: We report 5 cases of rectal cancer. All of them were neoadjuvant treatments. The staging was T3-4 and N0-1. All the patients received concomitant capecitabine with RT.

Results: We appreciate that both treatments achieve good coverages of the PTVs. The following table shows median dose with standard deviation achieved in the OARs: We find differences in toxicity and conformation of the treatments, being better the results of the VMAT technique.

Conclusions: We conclude that both techniques are similar in PTV coverages, but VMAT treatments reach a better conformation and deliver less doses for the OARs, achieving less toxicity for patients.

RECTAL SPANISH PROVINCIAL COMMITTEE: FIRST RESULTS OF AN INTERHOSPITALLER EXPERIENCE

Trilla, J.; Feliu, F.; Sales, R.; Sánchez-Marin, A.; Merino, S.; López, Y.; Ramos, F.J.; Diaz, M.L.; Zugazaga, A.; Arenas, M.

Introduction: Our spanish province covers a population over 810,000 habitants. In 2013, the incidence of colorrectal cancer was 735 cases; the 1/3 part correspond to rectal cancer. It was decided to constitute the Rectal Unique Spanish Provincial Committee in April 2014.

Methodology: The Committee consists of a multidisciplinary team of 43 professionals from the 4 hospitals in the province. The sessions are conducted biweekly and on a rotation basis We analyse patients treated in our spanish province from April 2014 to January 2015. Two types of neoadjuvant scheme were used: LONG COURSE (pelvic radiotherapy with rectal boost to reach 50.40 Gy in 28 sessions + concomitant oral capecitabine) or SHORT COURSE (pelvic radiotherapy to reach 25 Gy in 5 sessions). The tumor regression grade was performed using the

Dvorak scale (0: absence of response and 4: complete regression). Waiting time to the surgical intervention: LONG COURSE aproach: 8 weeks. SHORT COURSE approach: 14 days.

Results: 20 sessions were performed; having reviewed a total of 102 patients. 61 patients received preoperative treatment (60%): 53 the LONG COURSE and 8 the SHORT COURSE. Tumor regression grades: after LONG COURSE (39 patients have been operated): 0:0 (0%). 1:9 (23%). 2:14 (36%). 3:6 (15%). 4:10 (25%). After the SHORT COURSE (6 patients have been operated): 0:0. 1:4. 2:1. 3:1. 4:0.

Conclusions: Creating a unique provincial committee has allowed an integrate and multidisciplinary rectal management in a Spanish province. These results showed that we can achieve and probably improve the quality standard set for rectal cancer.

REVIEW OF ADJUVANT RADIOTHERAPY IN COLON CANCER

Escribano, M. C.; Martínez, J.; Hervás, A.; Fernandez, E.; López, F.; Ramos, A.

Purpose: This study analyzes the results of adjuvant radiation therapy in colonic adenocarcinoma treated in our institution.

Patients and methods: A restrospective analysis was performed of 9 patients diagnosed of colonic cancer with high risk factors (ulceration, perforation, extension through any organ) from June 2005 to July 2013 treated with adjuvant radiotherapy after resection with or without concomitant chemotherapy. Five patients received tumour-bed irradiation, and in the remainder, the lymph nodes where also included.

Results: The median age was 70 years old (range 60-83), 5 male and 4 female. Tumour stage was III in 66.7% of cases and IVa in 33.3%, presenting ulceration and/or perforation 8 of them. The median dose of radiotherapy was 50.4 Gy (range 32.4 to 50.4) and only one patient was unable to finish treatment due to toxicity. 6 patients presented enteritis between G1 and G3 and 3 patients presented G4. Median follow-up was 45.5 months (range 16-113). Two-year and five-year overall survival and cause-especific survival were 88.88% due to one death during the follow-up of these patients because of persistent disease.

Conclusion: Postoperative radiotherapy in locally advanced colon cancer, is a feasible treatment that provides adequate local control and probably improves overall survival in our series, with an acceptable toxicity.

ROLE OF ESSENTIAL AMINO ACIDS IN ANOREXIA CACHEXIA SYNDROME

De Torres Olombrada, M.V.; Juez Martel, I.; Garcia Cañibano, T.; Gutierrez Abad, D.

Introduction: The syndrome of anorexia-cachexia associated with cancer (SACC) is complex and characterized by progressive weight loss, decrease in skeletal muscle reserves with fat loss, anorexia, reduced general condition and, ultimately, quality of life. To evaluate the role of amino acid supplementation in SACC.

Material and methods: Nutritional intervention involved the administration of essential amino acids module 3 times a day for. 10 patients were applied 50%, with pancreatic cancer, 2 with gastric cancer, esophageal cancer 2 and one colon cancer. They would start or had started cancer treatment (50% concomitant chemo radiotherapy). Patients were evaluated at baseline day and month (4 weeks) overall generated by subjective assessment by the patient (VGS-gp), albumin and pre albumin.

Results: Of patients treated albumin median pretreatment was 3.6 compared to 3.5 after treatment, pre albumin passage of 16.7 to 15.75, There was an improvement in the overall valuation opinion mainly at the expense of quality points concerning feeding although this improvement did not reach the statistical significance (VGS-gp 11.50 to 9.44). Adherence was 100% and was well tolerated.

Conclusion: The study showed maintenance on nutritional parameters despite applying intervention procedures in patients undergoing high metabolic stress, and improvement in VSG-gp (p 0.12).

SECOND PRIMARY CANCER AFTER RADIOTHERAPY TREATMENT: A POPULATION-BASED STUDY

Arenas, M.; Sabater, S.; Gascón, M.; Díez, M.; Trilla, J.; Gómez, D.; Henríquez, I.; Besora, A.; Carulla, M.; Rovirosa, A.

Introduction: The radiotherapy treatment can produce a possible new second primary cancer. We have studied the risk of developing a potential radiotherapy induced second cancer.

Material and methods: We analyse the new second cancers after a radiotherapy treatment for a primary cancer in a population-based study in a province of Spain from 2000 to 2011.

Results: The number of patients (pts) with cancer treated with radiotherapy during this period was 14131, 2989 were breast cancer, 2197 were prostate cancer and 1220 pts were rectal cancer. Three hundred and thirteen (2.2%) patients developed a second cancer after a primary cancer treated with radiotherapy. In relation to the primary cancer, the most frequent were prostate cancer (70 pts, 22.4%), the second breast cancer (43 pts, 13.7%) and the third colorectal cancer (40 pts, 12.8%). The location more frequent after a prostate cancer irradiation is lung (20 pts) and colorectal (17 pts, 9 rectal and 8 colon) and bladder (8). The location more frequent after a breast cancer irradiation is another breast cancer (21 pts). Colorectal 40 pts: 9 second colorectal, 8 lung cancer.

Conclusions: The percentage of pts treated with radiotherapy who developed a second cancer after 11 years is 2.2% in our series. It's difficult to know the real probability for developing a second cancer associated with radiotherapy. The higher percentage of primary tumour with second cancer was rectal cancer (40/1220, 3.27%), the second was prostate cancer (70/2197, 3.18%), the third was breast cancer 43/2989, 1.43%).

SEQUENTIAL CHEMORADIOTHERAPY AS ADJUVANT TREATMENT IN RESECTED GASTRIC CANCER PATIENTS

Calvo Tudela, A.; Pacios Blanco, R.E.; Castillo Pérez, I.; Jurado Garcia, J.M.; Guerrero, R.; Garcia Puche, J.L.

Background: Surgery has been established as standard treatment in locally advanced resectable gastric cancer patients. Due to the high number of local and distant relapses, consolidation treatment with radiotherapy and chemotherapy is necessary in an attempt to eradicate microscopic disease. We conducted an evaluation of safety and efficacy of adjuvant treatment.

Methods: A retrospective analysis was performed on 35 patients between September 2001 and April 2007. At the time of the diagnosis, the stages were distributed as follows; 6 E-II; 15 E-IIIa; 7 E-IIIb, 7 E-IV. All patients were histologically proved adenocarcinoma. Treatment pattern began with surgery in all patients, 24 total gastrectomy and 11 subtotal gastrectomy. Then chemotherapy based of six cycles of epirubicin (50 mg/m^2) and cisplatin (60 mg/m^2) on day 1; and continous infusion of fluorouracil (200 mg/m^2) for 21 days. Finally all patients received radiotherapy administered on gastric region and adjacent lymph nodes as follows; 45 Gy, 1.8 Gy/fractions.

Results: 33 patients completed treatment (94.3%). One patient did not finish treatment due to severe neutropenia (GIII-IV); In

terms of radiotherapy, two patients left treatment because poor gastrointestinal tolerance. With a median follow-up of 7 years, the overall-survival rate was 51.42%, and relapse-free survival rate was 45.71%.

Conclusions: Adjuvant chemotherapy based of ECF and sequential radiotherapy in resected gastric cancer patients has evidenced an important impact in terms of local control and overall survival. This pattern was effective and well tolerated in terms of acute and chronic toxicity. However, those findings require further prospective investigation.

SHORT-COURSE RADIOTHERAPY FOR LOCALLY ADVANCED RECTAL CANCER

Nicolau Martorell, C.; Casasús Farré, M.; Mestre Mestre, F.J.

Purpose: Preoperative short-course radiotherapy (SCR) is an option described in patients with locally advanced rectal cancer. This study examined the response to radiotherapy and the outcome of this schema of treatment in patients treated in our institution.

Methods: A retrospective monocentric cohort study has been done with patients treated with SCR for rectal cancer between July 2011 to May 2014. Operable patients with locally advanced rectal cancer received 25 Gy in five consecutive fractions to the posterior pelvis, followed by surgery. Pathological response was assessed in all patients.

Results: A total of 10 patients had SCR and posterior surgery (median age 70 y). 3 patients received neoadjuvant chemotherapy for lung and hepatic metastases, with complete response previous to SCR. The clinical stages were I to IVB (1 patient with ovarian metastases). The median interval to surgery was 18.7 days (7-46 days). 9 of 10 patients underwent complete surgical resection with 100% having pathological negative margins. The pathological stages were I to IVA (ypT1 to ypT4). 4 patients received adjuvant chemotherapy. With a median follow-up of 24.5 months (7-41 months), 7 patients are alive and free of disease. 2 patients have died because of lung metastases and 1because of hepatic metastases.

Conclusion: Being our study still in a recruitment phase, the results of the treatment with SCR for locally advanced rectal cancer in our institution are consistent with the existing literature.

SMALL CELL ESOPHAGEAL CARCINOMA WITH RADICAL QUIMIORADIATION: A CASE REPORT

Domingo, C.; Castilla, J.F.; Alcalá, M.; Ciafre, A.; Maroñas, M.; Dualde, D.; Jordà, E.

Objectives: To evaluate the effectiveness of the administered treatment and his tolerance compared with the literature.

Material and methods: The small cell carcinoma (SCC) of esophagus is a rare, aggressive tumor associated with a poor prognosis, because of its rapid progression. There is currently no standard therapy. A 50-year-old indian female was diagnosed of SCC in the middle esophagus (Stage IIIA, T3N1M0). On the basis of regimens reportedly effective for small cell lung cancer, we performed chemotherapy with CDDP-VP16 and concomitant radiotherapy. The treatment was performed in three phases to 180 cGy/fraction/day. The first phase included tumor and suspicious node (situated in celiac trunk) plus risk lymph nodes (posterior mediastinum, celiac trunk and subcarinal) with a total dose of 45 Gy. The second, included tumor and suspicious node to 50.4 Gy. Lately, tumor dose up to 59.4 Gy. Two months later, the patient received a prophylactic cranial irradiation, total dose of 25 Gy. Once treatment was completed, we observed a complete response. As a acute toxicity, neutropenic fever grade IV and mucositis grade III was reported.

Results: The scheme of treatment administered achieve a complete response of the disease with an acceptable toxicity. She has been closely followed up in our outpatient clinic for 18 months and has shown no evidence of recurrence.

Conclusions: We concluded that the optimum treatment seems to be the same as for SCC of the lung. However, new prospective studies should be made to determinate an standard protocol.

STARTING VOLUMETRIC MODULATED ARC RADIOTHERAPY (VMAT) FOR ESOPHAGEAL CANCER

Lozano, J.; Ramirez, T.; Feltes, N.

Background: Lung and heart radiation injury are a critical complication of preoperative chemoradiation for esophageal cancer (EC). In order to improve the therapeutic ratio, we started in 2014 VMAT for selected EC patients. The aim of this study was to investigate the dosimetric improvement for planning target volume (PTV) and organs at risk (OAR) in this patients by applying VMAT compared with trhree-dimensional external beam radiotherapy (3DCRT).

Methods: Four patients with EC were treated with pre-operative chemoradiation. Both VMAT and 3DCRT plans were generated in all cases and Dose Volume Histogram (DVH) comparative analysis was performed for PTV, lungs and heart.

Results: The VMAT plans provided in all the patients superior PTV coverage compared with the 3DCRT plans and less irradiation to lungs and heart.

Conclusions: The VMAT plans resulted in superior dose distribution with a reduction in the dose to lung and heart, compared to 3DCRT.

SYNCHRONOUS RECTAL AND PROSTATE CANCER: CLINICAL MANAGEMENT

Domínguez-Rullán, J.A.; Hervás, A.; Fernández-Lizarbe, E.; Martínez, J.; López, F.; Vallejo, M.C.; Sancho, S.; Muñoz, T.; Ramos, A.

Objective: Synchronous diagnosis of prostate and rectal tumours is uncommon and data related to management is limited. In this review, we describe a single-institution´s experience and we discuss the relevant available evidence to address its best treatment approach.

Methods: Between January 2002 and December 2014, a retrospective review of the Pathology Unit Database was performed to identify patients with co-existing prostate and rectal cancers diagnosed at our institution. Clinical outcomes were analysed and literature search was performed using PubMed and EmbaseTM to propose a management algorithm.

Results: Five patients with localized synchronous prostate and rectal cancer treated with curative intent were identified. Treatment included neoadjuvant chemoradiotherapy followed by combined radical retropubic prostatectomy and anterior rectal resection in two patients. Panproctocolectomy and radical prostatectomy with long-course postoperative chemoradiation in two patients. Lastly, in a patient, transanal excision in combination with androgen deprivation therapy was performed. Four patients remain disease-free and one patient developed oligometastatic rectal disease treated with rescue surgery without evidence of current disease.

Conclusions: Although cases are scarce and appropriate management remains unclear, it should be individualised based on clinical stage and performance status and discussed by a

Multidisciplinary Team (MDT) taking into consideration different treatment options including surgery, EBRT, androgen suppression and watchful waiting.

THE ROLE OF CHEMOARADIOTHERAPY IN THE ADYUVANT SETTING IN RESCTABLE PANCRETIC CANCER

De Torres Olombrada, M.V.; García Cañibano, T.G.; Gutierrez Abad, D.; Juez Martel, I.; Ludeña Martinez, B.; Losada, B.; Pereira Perez, F.; Rodriguez Rodriguez, C.

Purpose: The role of radiation in the adjuvant setting remains controversial. We retrospective review of the clinical course of 35 patients undergoing resection of carcinoma of the pancreas treated at our institution with chemotherapy vs radio chemotherapy.

Patients and methods: Between 2004 and 2014, undergoing resection, 9 patients (25.7%) were found involved surgical margins. 14 (40%) patient received chemo radiotherapy. Radiation therapy was delivered to the surgical bed and regional nodes to a median dose of 5040 cGy with intensity-modulated only if margins were involved. Concurrent chemotherapy were administrated in all patients. Outcomes measures included loco regional control, disease-free survival, and overall survival. Univariate analysis was used to assess the impact of adjuvant therapy.

Results: After a median follow-up of 43.5 months for survivors, overall 3-year survival was 54.3%. Survival was worse for patients with positive margins (26 m vs. 59 m, p<0.292). In univariate analysis, the use of adjuvant chemo radiation had no clear impact overall. 9 patients receiving no adjuvant therapy remained disease-free during follow-up compared with 6 of 15 patients receiving adjuvant therapy.

Conclusion: In our cohort of patients with resected pancreatic cancer, chemo radiotherapy did not improve OS after, but its only applicate in works prognostic patients.

THE USE OF MRI AND COLONOSCOPY (CL) IN CONTOURING GTV RECTAL

Jimenez-Jimenez, E.; Mateos, P.; Pardo, J.; Montemuiño, S.; Ortiz, I.; Aymar, N.; Alastuey, I.; Mena, A.; Font, J.C.; Sabater, S.

Objectives: Despite the better soft tissue delineation provide by MRI, modern radiotherapy contouring is based upon planning CT (PCT). The accuracy of boost volumes generated depends on precise GTV contouring in PCT. Our goal is to compare MRI and CL information with PCT in order to improve boost contouring.

Material and methods: Imaging and planning data for 40 patients with locally advanced rectal cancer were reviewed. GTV was contoured according to the clinical-radiological information. For each patient, tumor location and tumor length was compared between CL and MRI with respect to PCT. Data were analyzed using MatLab 7.10.0 (R2010a). The significant differences between these parameters were evaluated by the Wilcoxon signed-rank test.

Results: CL tumor location was more cranial, in 73.4% of cases, than in PCT. Mean difference was 2.93 cm (p<0.001). A cranial location was also seen on MRI, in 79.3% of cases. Mean difference was 3.96 cm (p<0.001). MRI reported distances from the anal verge were greater, in the 55.2% of cases, than distances reported on CL. A complete agreement was observed in ultra-low tumors. No clear pattern could be described with respect of the tumor length.

Conclusions: The location of a tumor or its length, assessed by different imaging modalities, may not be equivalent. Tumor location was described more caudal on MRI and CL than PCT. This can result in a dose reduction to organs at risk and facilitate dose escalation. A complete agreement was more frequently observed in low tumors.

TUMOR REGRESSION GRADING OF RECTAL CANCER AFTER NEOADJUVANT TREATMENT

De Torres Olombrada, M.V.; Garcia Cañibano, T.; Losada Vila, B.; Juez Martel, I.; Gutierrez Abad, D.; Camara Vicario, J.C.; Ludeña Martinez, B.; Rodriguez Perez, A.

Introduction: Preoperative chemo radiotherapy is an effective therapeutic tool that has shown an increase of local control in rectal cancer Increasingly more scientific evidence that ranks high pathologic complete response or as an independent predictor of local control and distance as well as disease-free survival and overall survival. The purpose of our work is to analyze the pathological responses in our series of patients treated with neoadjuvant intent.

Material and methods: From 2010-2015 a total of 131 patients have been treated at our institution for rectal cancer. All received preoperative treatment RT in two phases, the pelvic to 45 Gy and 50.4 Gy in tumor area using 3D RT. Chemotherapy was administered concomitantly with 5FU-based regimens (oral or iv). We used the grading system response Dworak for rectal cancer to homogenize our results. All patients completed neoadjuvant and were operated at 6-8 weeks.

Results: 31.7% of the series had complete pathologic response (ypT0N0) in the surgical specimen. Of the remaining 30.9% had a degree of regression (GR) 3 GR 2 18.7%, 18.7% GR 1 and only one patient had GR0. With a median follow up of 25 months 83.2% of patients remained free of disease, 17.8% developed distant disease and one patient (1.3%) currently have a local relapse at external iliac.

Conclusions: Our study shows that performing preoperative chemo radiotherapy and multi multidsiciplinar way is feasible, with a high degree of complete pathological response. This is comparable to that reported previously in the literature. Our series needs further monitor whether the GR correlates with better overall survival and disease-free survival.

UNEXPECTED TOXICITY OF DELAYED SURGERY IN SHORT-COURSE RADIOTHERAPY

Jimenez-Jimenez, E.; Mateos, P.; Pardo, J.; Montemuiño, S.; Ortiz, I.; Aymar, N.; Alastuey, I.; Mena, A.; Font, J.; Sabater, S.

Introduction: Short-course radiotherapy (SCRT) followed by immediate surgery at 1 week is an option treatment in rectal cancer. Currently, the SCRT and delayed surgery (i.e. 4–8 weeks) after radiotherapy (RT) is being evaluated. Our aim was to evaluate the acute toxicity of patients treated with SCRT in the weeks before the surgery in our hospital.

Material and methods: 17 patients treated with 25 Gy in 5 consecutive fractions followed by surgery were analyzed. Surgery was performed 1-3 weeks after the beginning of RT. Surgery was performed 1 week after RT in 6 patients, 2 weeks after RT in 9 patients, and after 3 weeks in 2 patients. Acute toxicity assessment was performed during routine follow-up examinations and toxicity grades were assessed with the RTOG scale. All data analyzed by Microsoft Office Excel 2007.

Results: Little toxicity was observed in the 6 patients in whom the surgery was performed 1 week after RT. Patients in whom surgery was delayed 2-3 weeks after RT, acute toxicity get worse (≥grade 2-3). The most severe symptoms were asthenia, diarrhea and proctitis. 2 patients that had surgery beyond 3 weeks from the end of RT required admission for symptom control.

Conclusion: Our data suggest that SCRT followed by delayed surgery (1 week) is well tolerated. However, beyond the 2-3 week toxicity increases and may require medical treatment at the hospital. SCRT and delayed surgery (4-8 weeks after radiotherapy) may improve outcomes, but the acute toxicity of these patients should be carefully evaluated.

UPDATE DATA OUR EXPERIENCE IN THE TREATMENT OF ANAL CARCINOMA

Calvo Tudela, A.; Gálvez Montosa, F.; Delgado Ureña, M.T.; Villaescusa Molina, A.; Castillo Pérez, I.; Yélamos Vargas, M.S.; Gonzalez Rodriguez, C.; Jurado Garcia, J.M.; Sanchez García, M.J.; García Puche, J.L.

Background: The epidermoid anal carcinoma is a rare disease, accounting for 4% of all tumors of the lower gastrointestinal tract and 1.6% of digestive tumors. The aim of this study is to review the experience at our center in the management of this entity.

Methods: This is a retrospective observational study in which includes 12 patients with squamous cell anal carcinoma T2-T4/N0-N3/M0 treated between August 2003 and October 2014.

Results: The study presents a median age of 52 years, 7 men and 5 women, 50% HIV affections. All patients received radiotherapy with a median dose of 60 Gy at 2 Gy/fraction. 6 patients were treated concomitantly with standard schema 5-FU/mitomycin, with good tolerance. Of these, 2 were surgically treated. 2 patients received chemotherapy with 5-FU/cisplatin followed by radiotherapy and surgery, and 4 patients underwent radiotherapy and surgery. 8 complete responses, of which 6 received standard treatment, and 4 partial responses were obtained. In 2 cases relapsed lung and liver. In one case was detected local relapse. To date of data collection, 8 patients remain alive without disease, 7 which obtained complete response to treatment. 3 patients died of the disease and there was a loss to follow.

Conclusions: Standard treatment of squamous cell anal carcinoma is concomitant chemoradiation and surgical salvage in selected cases. It is a well tolerated treatment, which enables preservation of the anal sphincter in most cases. The patients without complete response to treatment showed worse prognosis in the monitoring.

VOLUMETRIC ARC THERAPY IN RECTAL CANCER

Escolar Perez, P.P.; Gómez Aparicio, M.A.; Iglesias Agüera, A.; Salinas Ramos, J.

Objectives: To know the results of acute toxicity and pathology of rectal cancer treated with neoadjuvant VMAT.

Material and methods: Between May 2011 and December 2013, 67 patients were treated with radiochemotherapy (VMAT and capecitabine). The mean age was 61 years, with 66% of men. The clinical stages were: II 12%, III 83% and IV 5%. The location of the tumor was: superior 46%, middle 27% and inferior rectum in 27%. All patients received 50.4 Gy to the PTV pelvis in 28 fractions. Surgery was performed at 8 weeks post radiotherapy.

Results: Acute toxicity (CTCAE 4) was: Diarrhea G0-G1 93%, G2 7%. Cystitis G0-G1 91%, G2 9%. Proctitis G0-G1 60%, G2 36%, and G3 4%. Low anterior resection was performed in 68%, abdominoperineal amputation in 25% of cases and 7% not operated for patient refusal or unresectable. The TNM stage after surgery was: IV 1%, III 22%, II 27%, I 19% and complete response in 21% of patients.

Conclusion: VMAT radiotherapy achieves the same results in terms of complete response and down-staging than previously reported at the same dose, but with less acute toxicity than conventional radiotherapy.

UNIVERSITY TEACHING

EVALUATION PRACTICES IN RADIATION DEPARTMENT: DEGREE OF MEDICINE

Arenas, M.; Sabater, S.; Biete, A.; Gómez, D.; Gascón, M.; Arguís, M.; Murcia, M.; Trilla, J.; Lafuerza, A.; López, I.

Introduction: In a specific Spanish University, Radiation Oncology Department teaches 11 hours of theoretical lectures, seminars 3 hours and 4 hours of practice per student. Radiation Oncology teaching in this University is taught within the subject of Diagnostic Imaging Radiology, which is taught in the 3rd Medicine Grade and also includes teaching of Radiology and Physical Medicine. In relation to the practices students spend a day into the Radiation Oncology Department in groups of 5-6 students. It was considered important to give weight to the evaluation of practices to the final marks. Due to the difficulty in objectively rate practices undertaken by students, we decided to base the evaluation on the performance of work. This is the third year that this evaluation system starts.

Material and methods: The work consists of several parts, including: introduction to radiotherapy, radiotherapy treatment process, document the clinical cases observed the day of practices, conclusion and personal opinion.

Results: Student's reports show that students have achieved the goal, which is to know the specialty of Radiation Oncology, to know which patients are candidates to radiotherapy and, to be able to explain what radiotherapy is and to explain its acute and chronic toxicity.

Conclusions: The conclusions reached in the work evaluated have been good, expressing his satisfaction with the first contact with the patient, as well as suggestions on to teach the subject in 3rd Grade difficult for them to learn certain aspects in relation to diseases due to lack of knowledge this course.

INTERNATIONAL MASTER ON ADVANCED TECHNOLOGICAL APPLICATIONS IN RADIATION ONCOLOGY: A COMMITMENT TO TRAINING SPECIALIZED IN HIGH TECHNOLOGY

Yélamos Agua, C.; Azinovic Gamo, I.; Samblás García, J.M.; Fernández-Villacañas, M.A.; García-Stañ, J.; García, R.; Serna, J.P.; Marsiglia, H.; Calvo, F.A.

Objectives and purpose: To introduce the quantitative and qualitative analysis of our training program Master in Advanced Technology Applications in Radiation Oncology of the Foundation IMO Group in collaboration with the University of Murcia and the Foundation for Training and Health Research in the Region of Murcia.

Material and methods: The IMO Group Foundation has trained 52 specialists in Oncology from 21 different nationalities with a specialized program of one year duration, training theoretical-practical program over 3000 hours and 60 academic credits.

Results: More than 200 professors have participated in this training program that has offered 174 teaching sessions, 31 specialised courses, 28 seminars and 1.307 conferences with 667 hours published on the virtual campus. The activity data of the Master as well as the satisfaction of participants and the teachers with the training programme are presented. The sci-

entific activity carried out within the framework of the training programme offered 53 posters presented at national and international conferences, 24 oral presentations and 18 scientific publications in international journals.

Conclusions and implications: Offered as a postgraduate training programme is currently leading in its field at an international level and is notable for the involvement between the students, the clinical practice, professeurs, University and the foundational level.

MEDICAL STUDENTS' PREFERENCES DURING PRACTICE IN RADIATION ONCOLOGY DEPARTMENT

Otón Sánchez, L.F.; Fuentes Sánchez, C.; Rodriguez Hernández, F.; Vera Dumpiérrez, M.; Otón Sánchez, C.A.

Introduction and purpose: Practical training in Clinical Oncology in our University includes 100 hours, half of them in the Radiation Oncology Department. A prospective study has been carried out on students' preferences, to quantify satisfaction, identify areas for improvement and assess changes in the perception of Clinical Oncology.

Material and methods: During the academic year 2013-14 an anonymous survey was given to all students at the end of radiation oncology practices. Nine questions inquired the student's opinion on the relevance and organization of the practice as well as his/her perception on Oncology. In addition, student was asked to rate seven of the assigned tasks in terms of personal predilection.

Results: 57 surveys were completed. Tasks were considered useful and instructive by 80-98% of students, obtaining higher scores those performed with physicians. 81% considered appropriate the practice duration. Organization and relationship with the hospital professionals were rated good or optimal in 90% of reviews. When asked if they were more liable to choose a medical specialization related with oncology, 48% showed somewhat or strongly agreed. Regarding their preferences, the most appreciated tasks were medical consultation and surgical work, while contouring and admission note preparation scored the lowest mark.

Conclusions: Practices in our Radiation Oncology Department are positively valued by medical students. Among other reasons, this can be attributed to a favorable integration of students in the hospital and professionals' work. The main weakness lies in our inability to promote self-education and autonomous work.

MANAGEMENT

IMPLEMENTATION CHECK LIST FOR TREATMENT IN RADIOTHERAPY

Nuño Rodriguez, M.C.; Manzano Martínez, F.J.; Rios Pozo, B.; Pérez Gonzalez, M.A.; Moreno Ceano, P.; Begara de la Fuente, J.

Objective: All those who have worked in a radiotherapy unit know that there are many steps in each stage of the treatment making it easier for errors to occur. We proposed, after selecting a period that contained errors, that some action be taken to minimise those problems. We agreed that establishing a method for reducing the errors would be useful, however this should not interfere or delay the main objectives.

Material and methods: A treatment check list has been created taking into consideration the operating theatre style used in each daily session with all patients. A directory was also created to explain each of the steps and then a briefing was held. Each of the two technicians were assigned a number of points from the checklist. Was launched in 2011.

Results: Since the launch we have not had an errors occurring in the registered steps.

Conclusion: It is vital to implement tools that reduce the occurrence of errors in treatments. Also, it is important to encourage teamwork and involvement by each team member in the treatment process and to promote a culture for reporting errors without fear of reprisal.

CHRONOLOGY OF THE SATISFACTION OF PATIENTS´ SATISFACTION AT JUAN RAMON JIMENEZ HOSPITAL I N HUELVA

Fernandez Cordero, M.J.; Sánchez González, M. C.; Ruiz Vazquez, M.; Bayo Lozano, E.

Objectives and purposes: The aim or our analysis was to identify the degree os satisfaction of patients treated in the Radiation Oncology service and make a comparasion with previous years, allowing us to establish improvement plans and evaluate the perception/satisfaction with those who are active.

Materials and methods: We have compiled the data reflected by patients through satisfaction surveys, suggestions or complaints filled voluntarity and anonymously deposited in a maibox on a sealed envelope on the waiting room. The reason for satisfaction, suggestions or camplaints have been divided into several categories: care, treatment, information, organization, procedures and facilities.

Results: A total of 104 surveys, 75 of them corresponded to thanks and the rest of them were divided between complaints and suggestions. After analyzing the evolution from 2009 to 2013, complaints have decreased in favor of suggestions. Most of the are related to facilities, transportation, delayed consultation and treatment. Some problems about signing and placement of patients were also detected in the first visit. With the chronological analysis of complaints and suggestions, we have been able to develop improvement plans focused on problems with higher prevalence or incidence for patients.

Conclusions: Over the years an increase is detected in patient involvement. Since some years ago we have carried out improvements in the waiting room facilities and in the reception, now managed by assistants. We also adapted toilets. We continue improving transportation schedules and the accomplishment of it in consultations and treatment.

CONCORDANCE OF PARAMETERS IN A VIRTUAL PLANNING SYSTEM FOR IORT

Alvarado-Vásquez, E.; Araque, J.; Martinez, C.; Guerrero, L.; Sierra, I.; García, V.; González-San Segundo, C.; Gómez-Espí, M.; Lozano, M.A.; Calvo, F.A.

Background: Radiance, the first virtual planning system for Intraoperative Radiotherapy, allows to define and evaluate IORT parameters (applicator size, angle and energy) and dosimetric profiles in advance to the surgical procedure. Since late December 2013, our center has been performing virtual plans in order to optimize the selection of treatment parameters. We aim to report our early experience and a concordance analysis between virtual and procedural parameters.

Methods: A CT of the patient on the surgical position was used to contour target volumes and organs at risk and to simulate the surgical act. Different sets of virtual parameters (applicator sizes, beveled angles and energies) were evaluated, select-

ing an optimized set that allows the best coverage of the target volume with an acceptable dosimetric profile. After IORT, data regarding procedure parameters were collected.The intra-class correlation coefficient was used to analyze concordance between virtual and procedural treatment parameters (applicator size, beveled angle and energy).

Results: From December 2014 to December 2014, 106 IORT procedures were performed. A total of 94 treatment plans were performed using Radiance. The intra-class correlation coefficient for applicator size was 0.91 (CI 95% 0.87-0.94, p<0.05), for beveled angle 0.76 (CI 95% 0.66-0.83, p<0.05) and for beam energy 0.71 (CI 95% 0.59-0.80, p<0.05). The concordance was also significant in most of the different subgroups of pathology (breast, sarcoma, rectal cancer, pancreatic adenocarcinoma) and of anatomic region (breast, abdomen, pelvis and limbs).

Conclusion: Radiance is a highly reliable tool for pre procedure selection of IORT treatment parameters. This technology offers a sensitive and innovative opportunity for IORT treatment planning in the clinical setting. The authors would like to thank to Iván Balsa and the radiotherapy technicians staff at the Radiation Oncology Service for their support with imaging data acquisition.

DATA PROTECTION IN A RADIATION ONCOLOGY DEPARTMENT

Vazquez Hueso, M.V.; Pérez Martín, M.M.; Acuña Mora, M.; Peracaula Espino, F.J.; Del Castillo Acuña, R.

A large amount of information is collected, produced and managed within any radiation oncology department such as personal data, clinical history in electronic format and as hard copy, pictures adquisition to delineate volumes, treatment planning as well as its archive on Pictures Archiving and Communication System (PACS). Organic Law on Data Protection (OLDP) 15/1999 regulate the fundamental right to data protection. Our purpose is to list basic principles wich are contained in OLDP, to evaluate deggre of compliance in our clinical history template and to know level of awareness about data protection of medical and non-medical staff.

Descriptive study: A clinical history template on each pathology is used as a referent. Data quality and informed consent (IC) are evaluated. Level of awareness was studied by an anonymous survey. Adapted questionnaire was used based on Spanish Data Protection Agency Report 2010. Six principles into OLDP: 1) personal data quality principle, 2) duty of provide information about data collection, 3) duty of confidentiality, 4) data security, 5) consent of data subject, 6) personal data communication principle. With a clinical history template on each pathology every personal data are adequate and relevant (principle 1), and with a specific IC are achieved principles 2.5 and 6. Data security (4) is accomplished by restringed acces to clinical histoy online, although data security must be put into a wider context. Level of awareness was higher in non-medical staff (92% vs 87%). On healthcare management, data protection is a relevant issue. Specific trainning for staff is necessary.

DISTRIBUTION OF BURDEN OF CARE THROUGH THE USE OF INDICATOR PAURV

Wals Zurita, A.J.; Carrasco, F.; Illescas, A.; Flores, A.; Abu-Omar, N.; Pachon, J.; Marquez, M.; Mesa, C.; Miguez, C.; Sanchez Calzado, J.A.

In the Services Radiation Oncology different pathologies are usually handled by different doctors, so that 'thematic blocks' are created. where a professional is assigned a specific pathology (eg, head and neck) and also receive a bonus of very incident and prevalent patients (breast) as well as less common pathologies. As all patients have neither need the same 'dedication' and time, can produce a deal in absolute numbers would seem right that a priori but actually produce an imbalance in the care burden for their time. That is, is not the same 10 patients Head and Neck 10 others Hodgkin lymphoma patients. To avoid these descompesaciones a manager of a radiotherapy can adjust the burden of care physicians considering the time and dedication. Leveraging the tabulation by level of complexity by using URV made and agreed upon by the leaders Units Clinical Management in Andalucia, we have analyzed and verified the feasibility of using a standardized measure of the health care burden of an optional indicator with regard another.

GOOD CLINICAL PRACTICE AWARD BY THE NATIONAL HEALTH SYSTEM

Lupiañez Perez, Y.; Gómez-Millán Barrachina, J.; Pedrosa García, P.; Lobato Muñoz, M.; Bayo Lozano, E.; Medina Carmona, J.A.

Objectives: To evaluate process management versus traditional organizational models in Radiotherapy Oncology Services (ORSs), assessing effectiveness, efficiency, cost analysis and satisfaction of patients and professionals.

Method: Effectiveness assessment: Data were collected from two Public Services of Andalusia (September 2011 to August 2012): HPA0 and HPA1. In HPA0, intervention was implemented using a process management model. Efficiency assessment: HPA0 costs for 2012 were calculated and compared with those of another public hospital in Andalusia (HPA2) for 2008. The number of saved sessions using hypofractionated schemes versus classical schemes during 2012 was estimated. Patient satisfaction assessment: Data were collected from patient satisfaction surveys of HPA0 in two periods; 2008 management system based on traditional organizational model and year 2012 management system based on process management. To assess emotional climate of professionals: Performed in colaboration with EASP (Andalusian school of health).

Results: Effectiveness We found significant differences in the average waiting time for first visit and start of treatment and number of patients seen and treated annually. Efficiency There was a saving of 6035 sessions using hypofractionated schemes. The average cost per patient seen and treated in the first visit was lower. Patient satisfaction: Increased satisfaction Emotional climate among professionals: High emotional climate.

Conclusions: Process management in ORS reduces time to the first medical visit and treatment initiation, accelerator capacity is optimized and activity costs have been analysed.

HIGH-GRADE GLIOMAS TREATMENT IN REGIONAL-HOSPITAL. RESULTS WITH 12 YEARS FOLLOW-UP

Herruzo Cabrera, I.; Villanueva Alvarez, A.; Perez Gomez, R.; Villen Villen, J.C.; Azcoaga Blasco, J.; Márquez, B.; Fortes de la Torre, I.

Patients and methods: We analyzed 199 patients treated between 1999 and 2014 with high-grade glioma. Mean age 53.1 years. Surgery: complete resection 33.7%, 46.7% partial and 19.6% biopsy. AP: GBM 84.4%, 15.6% AA, anaplastic oligodendrogliomas. Treatment was: temozolomide administered concomitant and adjuvant, 6 or more cycles if residual tumor or progression. Conformal 3D-RT was administered in 94.5%, 5% 2D RT and 0.5% stereotaxtic radiotherapy.

Results: CR 35.2%, PR 19.8%, 23% EE and PE 22%. In total 79.1% relapse and 20.9% without relapse. Kaplan-Meier median overall survival (OS) 17 months (CI 1.7 13.5 to 20.4). OS rate of 67.4%, 38.3%, 26.5%, 19.5%, 14.3%, 11.7% at 1, 2, 3, 4, 5 and 6 years and 9.8% at 10 years respectively, being alive, 17.8% of patients. Recurrence-free survival median 7 months (CI 0.6 to 5.7-8.2). SLR rate of 34.4%, 21.8%, 13.7%, 13.7%, 12.2% at 1, 2, 3, 4 and 5 years respectively and 12.2% al 10 years. In univariate survival analysis for OS was significant AA favourable histology, surgery treatment, age (<60 years), KS, QT type, treatment response and in the SLR was significant age (<60 years), AA favourable histology, KS (100) and treatment response (CR). In multivariate analysis was significant histology, surgery treatment, age (<60 years), QT type, treatment response and in the SLR was significant, QT type, KS (100) and treatment response.

Conclusion: In our series has been a survival rate of 67.4% to 11.7% in 1-6 years, and SLR rate of 34.4% to 12.2% at 1-5 years.

IMPLEMENTATION OF THE QUALITY SYSTEM ISO-9001: 2008 IN RADIATION ONCOLOGY

Lozano Martín, E.; Lara Radríguez, P.; Santiyán González, A.; Morera López, R.; Arregui López, E.; Sanz Martín, M.M.; Lorente Sánchez, M.; Ríos Asus, P.

Goal and purpose: Describe the experience of introducing a system of quality management according to ISO-9001: 2008 in a Radiation Oncology Unit

Material and methods: We developed an organized documentary elements, knowledge and human and material resources based on ISO-9001: 2008 which ensures the proper functioning of Radiation Oncology Unit. After making a map of processes, have been developed strategic support and operational processes, procedures and work technique instructions that have allowed to identify and track quality indicators and preventive and corrective actions of each process and procedure. Also this documental development has alowed to build and maintain the demostration records evidencing the proper performance of processes and procedures.

Results: The creation of a documental base as a quality management system ensures tracking internationally recognized organizational standards, compliance with legal regulations and guidelines of scientific societies and European Council.

Conclusions: The ISO-9001-2008 allows, through external audits, verifying proper operation of the Radiation Oncology Unit, avoiding subjective oral communication and providing service quality and prestige facing patients, other hospital units and management.

INITIAL ACTIVITY OF A NEW RADIOTHERAPY UNIT IN ANDALUSIA

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Introduction: In November of 2014, a new Radiotherapy Unit was opened to provide treatment to patients in Cordoba and Jaen. The population of both provinces is 1,434,974 people. The SEOR advises to have a linear accelerator per 450 patients. International recommendations are a radiotherapy unit per 200,000 inhabitants. This unit is added at 5 existing units to provide radiotherapy in the territory.

Objective: Analyze the care activity in the first months of activity at the unit.

Material and methods: Between November of 2014 and February of 2015 we have attended a total of 84 patients. The cases are discussed in clinical session by 9 radiation oncologists. Patients have been treated by a linear accelerator, equipped with bone beam CT, and a brachytherapy system. We conducted a descriptive statistical analysis of the initial activity.

Results: Gender distribution is: 44 men (52.4%); 40 women (47.6%). Origin of the patients: Cordoba 55.2%; Jaen 44.8%. The most frequent pathologies: prostate (31%) and breast cancer (25%). Treatment intention: radical (44.7%); adjuvant (40.3%); salvage (5.7%); palliative (9.3%). Radiotherapy techniques: VMAT-IMRT 41 (48.8%); CRT3D 29 (34.5%); brachytherapy 7 (8.3%); RTEF 3 (3.6%) and 2D direct electron fields in 3 patients (3.6%). Also, 1 SBRT (1.2%). A large majority of patients are awaiting treatment response studies.

Conclusions: The activity of the service (not reached its maximum) reflects the care needs existing in North-Eastern Andalusia. In conjunction with other services, this unit results in a closer and high quality healthcare.

INTEGRATION OF A MINITUARIZED LIAC IN AN IORT EXPERT INSTITUTION

Alvarado-Vásquez, E.; Araque, J.; Martínez, C.; Guerrero, L.; Sierra, I.; Gómez-Espí, M.; Sendon, R.; Lopez-Bote, M.A.; Lozano, M.A.; Calvo, F.A.

Introduction: IOeRT is a consolidated program at Hospital General Universitario Gregorio Marañon, with over 1200 IORT procedures spanning a 20 years experience. Since late december 2013, a minituarized linear accelerator (LIAC) started to operate in our center. We aim to describe the ealy technical and clinical experience with LIAC in the context of and already consolidated IOeRT program.

Methods: From december 2013 to december 2014, 106 procedures in 90 patients were performed (90 procedures with LIAC, 16 transported to a fixed lineal accelerator).

Results: Cancer types treated were 31 oligorecurrences/oligometastases, 23 breast cancers, 21 rectal cancers, 19 sarcomas, 5 pancreatic adenocarcinomas, 3 esophageal neoplasms and 4 other cancer types. The treated anatomic sites included 46 cases in pelvis, 23 in abdomen 23, 23 in breast, 12 in limbs and 1 in thorax. Relevant operational data included 20 days with more than 2 procedures in the same working day (24% of total days). Six different applicator sizes were selected (range 4-10) with 4 beveled ends (range 0-45). Selected energies ranged from 6 to 12.

Conclusion: LIAC is a versatile technology able to be incorporated to expert IORT institutions promoting efficient action with operative benefits in terms of availability of OPRT components for cancer patients.

IONCOR: THE DEFINITIVE MOBILE APP FOR RADIATION ONCOLOGISTS

Montero, A.; Hernanz, R.; Polo, A.

Background: Mobile technologies are transforming the way in which we are learning and practicing medicine, oncology and radiotherapy. These advances have introduced new decision-making tools in the daily practice. Mobile apps have been created to help individuals in their own health management, but also to provide tools for clinicians for improving clinical attendance. Nearly 300 mobile apps for Oncology professionals can be found on both on-line stores, iTunes (iOS) and GooglePlay (Android), but less than 100 are designed for Radiation Oncologists.

Material and methods: In June 2014, we launched iOncoR, first mobile app in Spanish specifically designed for the practice of Radiation Oncologists available for iOS and Android, made

through collaboration between 3 radiation oncologists and the promoter InspiraNetwork. IoncoR was developed by Innovae with the support of Persan Farma. iOncoR is built on a 5 modules covering basic needs for the oncologist. Module of Calculators: radiotherapy dose equivalence (EQD2) based on LQ formalism, BED calculator for both external beam radiotherapy and HDR brachytherapy; PSA doubling-time calculator; creatinine clearance calculator and body-surface calculator. Module TNM: 7th edition of AJCC/UICC tumor classification. Module Reference Values: toxicity scales (CTCAE 4.0, RTOG/EORTC); performance-status scales (Karnofsky index, ECOG index) and QUANTEC tolerance doses. Module Medication Guide: including drugs frequently used. Module Nutrition: algorithms for assessment of nutritional status; body-mass index calculator; guide for nutritional supplements.

Results: In the first six months after its launch, iOncoR has been downloaded more than 1000 times, demonstrating the undeniable irruption of new technologies in clinical practice.

MADRID RADIATION ONCOLOGY: EQUIPMENT AND NEW TECHNIQUES. CURRENT SITUATION

Rodríguez Pérez, A.; Cerezo Padellano, L.; Pérez Casas, A.M.; Mañas Rueda, A.; Samper Ots, P.M.; Ramos Aguerri, A.; de las Heras González, M.; de la Torre Tomás, A.; Lozano Barriuso, M.A.; Pérez-Regadera Gómez, J.F.

Purpose: To update the radiotherapy infrastructures at the Public Health Radiation Oncology Departments (RD) in Madrid (CM).

Materials and methods: A questionnaire was designed by SERMAS. It provides details about the current situation of radiotherapy facilities and new available techniques. A descriptive study has been performed.

Results: There are 31 Megavoltage Units in 12 Hospitals, including a LINAC (1992) to irradiate blood products and the only Cobalt Machine (1977). 22 LINACS (71%) are less than 10 years old, the estimated lifetime period. Among them, 10 (32%) are younger than 5 years old and half of them have been installed in 2014, after the last public tender offer. Regarding the available techniques, all RD have IMRT. 55% are able to perform static, dynamic and volumetric IMRT and the same percentage perform SRS, cranial and body stereotactic fractionated radiotherapy. Three of RD perform TBI, two of them IORT and one, TSIe. Brachytherapy is available in 83%. All the RD have HDR with 10 afterloader units (one with a Cobalt source), five RD perform LDR prostate implants and one of them ophthalmic brachytherapy. There is an average of 14 working hours per day, with an estimated effective treatment time reduced by 30% because of quality control works.

Conclusions: There has been a great investment that has allowed performing all the modern radiotherapy techniques at CM. Nevertheless, it is necessary to arrange an intense renewal plan to replace the outdated equipment (29%) and to install new ones with modern technology, in order to keep on at the Radiation Oncology vanguard.

OPTIMIZING PATIENT SAFETY IN MANAGEMENT IN THE RADIATION THERAPY

De las Peñas Cabrera, M.D.; Samper Ots, P.M.; Amaya Escobar, E.; De la Casa de Julián, M.A.; Seguro Fernández, A.; García Marcos, R.; Moreno Cerrato, N.; Hernández Miguel, M.; Campos López, E.; Seguro Arribas, S.

Objective: To audit safety indicators in the "Verification Checklist Starting Treatment" included in the Protocol of Patient Safety of Radiation Oncology of HRJC in 288 starts of treatment from 05/05/2014 to 01/30/2015. Quality criteria for professional team involved. We carry out a first pilot in June 2014, with 43 starts, and compare with the current results.

Material and methods: 288 starts of treatment were analyzed. Safety items for professional were: RO (Radiation Oncologist): consent form, Allergy and warmings, laterality, prescription approved, signed planning, level of complexity. MPh (medical Physicists): Fields approved by MPh, MPh Planning signed, Displacement table isocenter, Check Mosaiq dosimetry, QA performed. Nurses (N): Overall assessment, nutritional evaluation, Nursing Instructions. RT (Radiation Therapists): patient ID Photo, positioning Pictures, simulation form approved, Site Setup completed, Pictures prepared in XVI, Calendar of treatment.

Results: Created the 99.65% (287/288) of checklists. Type tumor: Breast, 27.4% (79/288), 13.5% metastatic, lung 11.8%. According to profiles: RO: Double checkup: not present in 31.25%. Laterality appears in 99.3%. MPh revised: 92.4% (266/288 lists). RT 93.1% (268/288); N: 91.7%% (264/288) which is the most improved item (83.72 to 91.7%. Errors found: 1 fractionation; CF unsigned 12/288 4.16%; 4 detected allergies unregistered 1.4% (4/288). Erroneous complexity levels: 2/288. No photo identification and positioning: 1/288.

Conclusion: Start treatment checklist is a useful safety tool. It was made for the 99.65% of users. Double check let to detect more errors such as missing CI, allergies, among others. Registration of Nursing has improved.

PALLIATING BONE METASTASES: SHORT COURSE OF RADIATION VERSUS SINGLE FRACTION

Alcalá Giménez, M.; Domingo, C.; Castilla, J.F.; Ciafre, A.; Jordà, E.; Maroñas, M.; Ferrer, E.; Algás, R.; Dualde, D.

Objectives: Reviewing savings, both economics and sessions, with the treatment of palliative bone metastases with a single fraction.

Material and methods: Recent studies have confirmed the efficacy of managing bone metastases with a short course of radiation. The short course of 8 Gy x1 is as effective as and less costly than 30 Gy in 10 fractions, but his use is not common in clinic practice. A retrospective review of palliative treatments on bone metastases administered during the year 2014 (n: 136) in our institution that could be managed with a single fraction of 8 Gy from recommendations of ASTRO criteria. We excluded thirty-two (24%) patients, following ASTRO criteria: cortical affectation >3 cm, spinal cord compression, radicular compression, surgical fixation, caudal equina syndrome or those previously irradiated. A hundred and four (76%) patients were selected because of none of them presented the complications named before.

Results: We calculate total sessions administered on those 76% of patients that could be managed with a single fraction of 8 Gy (n: 695). Total sessions saved using the scheme of 8 Gy ×1 has been 591 fractions (85% of total sessions administered). In terms of economical saving represents the amount of 29.156 euros, approximately.

Conclusions: We conclude that in our institution it is supposed to effectuate twenty radical treatments more (with an average of thirty fractions/treatment). So, the use of a single fraction on bone metastasis should be an scheme more ordered in daily practice.

PROPOSED SEOR'S ETHIC CODE

Herruzo, I.; Macia, M.; Craven-Bartle, J.

Introduction: In 2009 we updated the Code of Ethic on SEOR and in 2011 the Spanish OMC update your code.

Justification: Given the time elapsed and the emergence of important decrees affecting clinical practice and the full development of Patient Autonomy Law 41/2002 and others related laws, forces to review the code and adapt to these changes.

Objective: Review, in the light of ethical principles and appeared new and update of SEOR Ethic Code.

Methodology: Analyze critically of codes national and international of scientific societies, Ethics Code of the OMC currently valid, to develop recommendations for changes or modifications.

Result: Has proposed a code of conduct and a set of ETHICAL PRINCIPLES:

1. General principles with protection partners.
2. Foreign physician with the patient, with four items: Basic principle, Communicate with the patient, Clinical chart and Professional Quality.
3. Quality of care and relationships with health institutions and patient organizations: the material and human resources, Rationing of benefits and waiting lists, Community Health and Relationship with patient associations.
4. Research and genetics: Pharmacological and Technical News. Clinical trials.
5. Professional secrecy physician conscientious objection, without specific article, refers to articles 27 to 31 and 32 to 35 of the OMC code.
6. Medical care at the end of life.
7. Foreign doctors each other and with other health professionals, with 2 items: style relations between radiation oncologists and malpractice.
8. Medical education, with one article: Teaching.
9. Advertising and publications policy: Advertising.
10. Fees, with a single article: Economic implications.

RADIATION ONCOLOGISTS AND SOCIAL NETWORKS: AN ESSENTIAL PARTNERSHIP. THE GEORM MODEL

Montero, A.; de las Peñas, M.D.; Algara, M.; Arenas, M.; Bayo, E.; Muñoz, J.; Moreno, F.; Martínez, F.J.; González, E.; Salinas, J.

Background: A significant number of oncologists, as well as cancer patients, utilize the Internet to obtain information about cancer. Internet and Web 2.0 platforms are changing the way in which we consider the practice of oncology. GEORM, the Spanish Group for Breast Cancer Radiotherapy, is the first group from SEOR to adopt the use of social networks in daily practice.

Material and methods: social networks are the new ways of communication of World Wide Web. Users and followers are constantly increasing: By the year 2013, Facebook was the largest networking service with ~1.15 billion users and many institutions and societies have their own pages; Twitter had ~554 million users as and the professional network LinkedIn was used by ~259 million members.

Results: At this moment, GEORM is present in majority of relevant social networks enabling physicians to share and discuss information and advances in radiation and oncology. The group of GEORM in Facebook (https://www.facebook.com/groups/georm.seor/), with more than 110 active members, allows members to exchange journal articles, comment doubts and questions about radiotherapy. GEORM in Twitter (@GEORM_SEOR) has increased in a few months reaching more than 300 followers. Finally, the largest professional social networking LinkedIn has its own group of GEORM, where nearly 100 members share and exchange information on the management and the latest research in breast cancer.

Conclusions: Radiation oncologists need to become familiar with social networks. GEORM is an excellent example that managing this social media tools will be a must for all oncologists in no time requirement.

RADIOTHERAPY INDICATIONS FOR CANCER PATIENTS IN A DEPARTMENT DURING FOURTEEN YEARS

Arenas, M.; Basora, A.; Sabater, S.; Anglada, Ll.; Gómez, D.; Henríquez, I.; Lafuerza, A.; Pardo, A.; Cabré, N.; Carulla, M.

Introduction: Our Radiotherapy Department is equipped with 4 linear accelerators, an orthovoltage, a CT-simulator and high-dose rate brachytherapy. We cover the need of radiotherapy treatment of a Spanish entire province with a total population over 810,000 inhabitants. Results and their historical evolution of radiotherapy treatments indicated in patients with cancer are presented.

Material and methods: We analysed the number of patients treated with radiotherapy in a Spanish province from 2000 to 2014. Percentages compared according patients number with cancer diagnosis from 2000 to 2014. From 2010 to 2014 they are estimation.

Results: During this period we have treated 19325 patients. 14862 (77%) treatment were radical intent and 4463 (23%) were palliative. The most common cancer treated was breast cancer (4226, 21.9%), the second prostate cancer (2917, 15%), the third head and neck (1514, 7.83%), and fourth skin cancer (1278, 6.6%) followed by rectal cancer (1220, 6.31%). A progressive increase in treated patients was observed, the year 2000 we treated 789 patients, and the last year we treated 1810 patients. No differences in age was observed during these years. The percentage of patients with cancer treated with radiotherapy during these years was 27%, 32%, 33%, 30.6%, 32.5%, 32.8%, 33%, 42%, 42%, 45%, 45% and 45%.

Conclusions: The percentage of patients treated with radiotherapy has increased progressively since 2000, presenting a greater increase in 2010 which was increased from 33% to 42%. At present the percentage is 45%, being stable over the last three years.

RATE AND VARIABILITY IN RADIOTHERAPY TREATMENT IN PROSTATE AND RECTUM CANCER. VARA III PROJECT

Expósito, J.; Castillo, I.; Martinez, M.; Herruzo, I.; Medina, J.A.; Palacios, A.; Bayo, E.; Peracaula, F.; Jaén, J.; Ortiz, M.J.

Introduction: External Radiotherapy (ERT) has proven to be an effective treatment in primary setting in non metastases prostate (PC) and rectum cancer (RC), when used alone or with other therapies in; however, underutilization has been observed in various studies.

Objectives: To assess the use of RT as primary treatment (alone or in combination) PC and RC in Andalusia a southern European region (rate of irradiation) and evaluate the variations in type of patients and RT characteristics among the different publics RT department.

Material and methods: 1) Rate of RT. A review of PC and RC treatment guidelines and observational studies was performed to estimate expected radiation rates[1]. 2) We then reviewed treatment records of patients undergoing radiotherapy for during 2013 in all public hospitals with radiotherapy facilities in eight Andalusia provinces. Data were grouped according to type of hospital, patient and types of tumours and treatment characteristics.

Results: Prostate. Estimated RT rate has been of 67% (1289 irradiated of 1917 expected). They were older than 70 years (43%) and in PS 0=47.6%. They had tumours high risk tumours in 44.7% and RT associated with HT in 57% of total cases. Regarding the type of RT, 70% were treated with 3D planning (30% IGRT) and doses between 70-76 Gy in 70% of cases (only 56 patients with doses above 76 Gy). Acute toxicities both intestinal and urinary collected were lower than grade 2 in 79 and 89% respectively. Among provinces, significant differences in irradiation rate

was found in four provinces (low than mean), and also in the distribution in risk groups attained. Rectum: Estimated rate of 71% was found (412 irradiated of 581 expected). Patients had a median age of 67y; PS<1 in 54% and stage III (A and B) in 60%. In 306 cases (74%) irradiation course were in neoadjuvant setting, 56 (18%) in short course (total dose <30 Gy y 5 fraction) and 250 with doses over 50 Gy, with concomitant chemotherapy in 124 cases (49.4%) (Frequent missing data in clinical records). The distributions among provinces did not show significant differences nether in rate of irradiation nor RT characteristics.

Conclusions: The observed underutilization of radiotherapy is about 30% in PC and 29% in RC. More variability in case distribution or type of RT is founded in prostate as compared with rectum cancer. These dates in our region should be a matter of concern, given its negative and measurable impact on the survival of our patients.

Reference:

1. Barton M, Jacob S, Shafiq J, es all. Review of optimal radiotherapy utilization rates. Ingham Institute. March 2013. http://tinyurd.com/pwkua34

SEOR' PATIENT SAFETY AND QUALITY CONTROL WORKING GROUP (PSQCWG). ITS CHALLENGES

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Objective: To analyse if the current Spanish legislation (SL): RD 1566/1998 and 815/2001 include the international recommendations on PS, and to implement appropriate measures to correct any possible deficiencies in this regard.

Material and methods: "Towards Safer Radiotherapy", "Radiotherapy Risk Profile", "Failure Modes and Effects Analysis (FMEA)", "Preventing Accidental Exposures from New External Beam Radiation Therapy Technologies", "Safety in Radiation Therapy: A Call to Action meeting recommendations", and "Safety is not accident" (2nded.) were reviewed and 11 topics were selected to compare with SL obligations regarding PS in RT: qualification, training, staffing, documentation/standard operating procedures, incident learning, communication/questioning, QC and preventive maintenance, accreditation, map of processes/risks and prospective risk assessment, strategies and tools development for minimizing risks and safety culture.

Results: SL include none of these issues: Relationship between staffing criteria and PS, Specifications about the number and quality of the documents that depend on a map of processes, Incident tracking, analysing, sharing and learning, Open communication and respectful questioning, Peer review, Maps of processes, Risks and prospective risk assessment, Strategies and tools for minimizing risks and, Safety culture. Due to lack of legal regulations, the SEOR board decided, in 2014, to create PSQCWG.

Conclusions: Being PS improvement a priority, by creating PSQCWG, SEOR intends to implement safe practices in RT, promoting research on PS and QC, and develop their own recommendations on PS, according to the internationally elaborated and adapting them, if necessary, to the reality of our country by updating Spanish legislation.

THE BENEFITS OF A GOOD NUTRITIONAL SUPPORT IN RADIATION ONCOLOGY

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Objectives: The aim of this study was to evaluate the nutritional status of cancer patients receiving radiotherapy (RT) and evaluate the result of making contributions on nutritional support for these patients as well as those at high risk of malnutrition.

Methods: Prospectively, 341 patients referred to our outpatient radiotherapy department were included. The median age was 65 years old. The patients were classified according to tumor site, previous treatment and intention of radiotherapy. Nutritional status at the onset at the end of RT was evaluated with the subjective global assessment (SGA), treatment risk groups, weigth and albumina levels.

Results: At the onset, malnutrition (group C in SGA) was present in 0.58% of all patients and it increased to 1.17% at the end of RT. This difference predominated in head/neck cancer patients. Of the patients analyzed, the 60.11% were among the high (24.9%) and moderate (35.1%) risk groups, with a median weight loss of 1.2 kg and 0 kg respectively. Patients who experienced greater weight loss (>5%) were those who had head/neck, digestive, gynecological and lung tumors (24%, 7.2%, 6.7% and 5.7%, respectively). The breast, prostate and cerebral cancer groups showed no significant weight loss. After treatment, 23.4% of patients gained weight (median: 2.2 kg). There was only one patient with albumin levels less than three.

Conclusions: The study shows the importance of having a good nutritional support during cancer treatments for patients at high and moderate risk not present significant weight loss, with a better response to treatment and consequent cost-effectiveness.

TIME TREND AND CHARACTERIZATION OF ELDERLY PATIENTS TREATED WITH RADIOTHERAPY

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Introduction: The incidence and prevalence of cancer in older patients has increased in recent years, due to increased life expectancy. We conceived this study due to the subjective impression of higher treatment rates in this population subgroup.

Objective: To assess the development over time and characterization of patients aged ≥85 years.

Material and methods: Descriptive and retrospective analysis of all patients aged ≥85 years who received radiotherapy in a Radiation Oncology Unit. We analyzed age, sex (period 1998-2014), pathologies irradiated and intention of treatment (period 2007-2014). Mean and standard deviation for quantitative variables and absolute frequency and percentage for qualitative variables were obtained.

Results: The percentage of patients aged ≥85 years throughout the period analyzed (1998-2014) accounted for 2.2% (393 patients). In the last 2 years of the analysis it reached 2.8%. The mean age of patients was 88±2.7 years (85-99). 48.5% were men and 51.5% women. In the second study period (2007-2014), treatment was administered with curative intention in 141 patients (57.3%) and palliative in 105 (42.7%). By sex, women were treated with curative intention (69.4%) more than men (45.6%). The most common pathologies irradiated were: rectal cancer (21.1%); skin (16.3%); breast (13.4%); gynecological (7.7%) and head and neck (7.3%).

Conclusion: The proportion of patients aged ≥85 years who receive radiotherapy has remained stable in recent years, with a slight upward trend. It is likely that our subjective assessment can become manifest in a subsequent study over the coming years.

GINECOLOGY

CANCER OF UTERINE CERVIX: PET-CT, IMRT AND HDR

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Purpose: To evaluate the treatment results, and complication rates in patients with locally advanced cervical cancer after external beam radiotherapy (EBRT) and high-dose rate (HDR) brachytherapy.

Patients and methods: All of patients with locally advanced cervical cancer (FIGO: IB 6 patients, II 9 patients, III 7 patients, IV 4 patients) treated with radical radiotherapy in our center from 2007 to Febrary2015 were reviewed. 26 patients were treated with EBRT using intensity-modulated radiation therapy (IMRT) technique following by HDR brachytherapy ± chemotherapy. The median age of patients treated was 51.5 years and the median of follow up was 15 months. Planification included CT (47.6%) or PET-CT (52.4%) for GTV delineation. The most common prescription was 50.4 Gy (1.8 Gy per fraction) for pelvic lymph nodes ± paraaortic lymph node with concomitant boost up to 60.48 Gy (2,16 Gy per fraction) for macroscopic nodal disease and parametrium affectation. HDR brachytherapy was applied using tandem (25 Gy in 5 fractions).

Results: This treatment was very well tolerated in our cohort of patients, no treatment interruption was required. With a median follow up of 26.5 months: 2 patients (7.7%) had local recurrence, 4 patients (15.4) had systemic recurrence and 20 disease free patients (76.9). The median progression-free survival was 22 months.

Conclusions: Radical radiotherapy +/- chemotherapy is still a standar treatment in locally advanced uterin cervical cáncer with good local control and global survival. Dose escalation is possible using PET-CT and IMRT which allow better conformation and better tolerance.

CHEMORADIOTHERAPY FOLLOWED SURGERY IN PATIENTS WITH LOCAL ADVANCED CERVICAL CARCINOMA

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Objective: To evaluate patological response and clinical outcomes in women with locally advanced cervical cancer treated with radiochemotherapy and surgery in a tertiary hospital.

Materials and methods: In this retrospective analysis we have included 57 patients with cervical cancer (FIGO stages IB2-IVA) who were treated between December 2004 and june 2014 with concurrent chemoradiation therapy (CCRT) followed by surgery. The patients were treated with pelvic external beam radiotherapy at 46-50.4 Gy, 1,8-2 Gy/day. Based on CT or PET CT if aortic nodes were demonstrated, extended external beam radiotherapy were performed. We boosted nodes or parametria if they were affected (60-66 Gy, 2 Gy/day). After four weeks of treatment, patients received brachytherapy from 15 to 26 Gy in 3-6 fractions with 2D or 3D planification (n=26), with a total tumour dose between 85 and 90 Gy. Concurrent chemotherapy with weekly platin and in some cases oral fluoropirimidine were administrated. Overall treatment time not exceed 8 weeks. All of them completed surgery between 4-15 weeks after CCRT.

Results: The median age was 51 ages (range 30 and 77). Squamous cell carinoma was the most common subtype (81%). All patients received hysterectomy. 7 patients (12%) underwent lymphadenectomy. In global, 30 patients (53%) had a complete response, 20 (35%) a partial response and 7 (12%) patients had residual microscopic disease in the patologic analysis. With a follow up of 46 months (range from 7 to 121 months) overall survival was 87% and disease free survival 83%.

Conclusion: Our results show that CCRT followed by surgery gets excellents outcomes with acceptable toxicity and may reduce local recurrences. Besides it enables assessment of the pathological response.

CLINICAL IMPLEMENTATION OF A NEW MR BASED INTRACAVITARY/INTERSTITIAL GYNECOLOGIC APPLICATOR

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Purpose: To present the experience of a novel MRI-compatible perineal template for MRI-Guided brachytherapy (BT) applications, in locally advanced cervix carcinoma (CC).

Materials: This template, adapts the currently existing manufactured MR compatibles Intrauterine tube (Nucletron-Elekta) and titanium needles (TN), with the capacity to cover the disease from "introito-vaginalis" to uterine fundus and whole parametrium. Following the recommendations of GEC-ESTRO, we use a T2 MRI sequence for delineation and a 3D radio-frequency Spoiled Gradient recalled Echo (SPGR) sequence to recognize the applicator and TN. From April 2013 until February 2015 we have treated 15 patients diagnosed CC. Eight patients has been staged as IIB, 3 patients IIIB, and four patients stage IV.

Results: The dose has been prescribed to IR-CTV (4 Gy x 6 fractions). We have compared this patients with 15 historical patients treated with MUPIT implants with the same stage and clinical characteristics. Median volume in all patients treated with MUPIT was 129.64 cc (45.2-241.17. Total volume of IR-CTV in MRI patients was 106.29 cc (61.8-188.68): 85.5 cc (61.8-123.31) in IIB, 102.60 cc in stage III (75.27-147.74) and 109.9 cc (79.36-134.76) in stage IV. The IR-CTV defined with MRI when we compare with the volume defined in CT is consistently lesser (30.01% lesser in stage II, and 41.57, and 41.38 lesser for stages III and IV respectively.

Conclusions: This new template allows extend possibilities in gynecological BT procedures. The volumes defined by MRI are inferior compared with the CT obtained, being more evident the difference in advanced stages.

CONCOMITANT CISPLATIN-PACLITAXEL CHEMORADIATION IN LOCALLY ADVANCED CERVICAL CANCER: 14-YEAR RESULTS

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Purpose: To determine the tolerability of a 7-week schedule of EBRT, HDR brachytherapy, and weekly cisplatin and paclitaxel in patients with locally advanced carcinoma of the cervix.

Methods: Thirty-seven patients with FIGO stages IB2 to IVa cervical cancer were treated with 40 mg/m^2 per week of i.v. cisplatin and 50 mg/m^2 per week of i.v. paclitaxel combined with 45 Gy of pelvic EBRT and 28-30 Gy of HDR brachytherapy.

Results: Eleven patients (29.7%) were able to complete the 6 scheduled cycles of chemotherapy. The median number of weekly chemotherapy cycles administered was 5. Forty (18%) of 182 cycles of chemotherapy were not given because of toxicity.

The mean dose intensity of cisplatin was 36.18 mg/m^2 per week (95% confidence interval [CI], 34.26-38.10); that of paclitaxel was 48.44 mg/m^2 per week (95% CI, 47.26-49.61). Thirty-four patients (91.8%) completed the planned radiation course in less than 7 weeks. Median radiation treatment length was 43 days. After a median follow-up of 6 years, 7 patients (18.9%) experienced severe (RTOG grade 3 or higher) late toxicity. No fatal events were observed. Nine patients have failed, 1 locally and 8 at distant sites. The 14-year locoregional control rate was 97.1%, and the 14-year freedom from systemic failure rate was 77.5%. Fourteen-year actuarial disease-free survival and overall survival were 44.8% and 50%, respectively.

Conclusions: This study demonstrates excellent very long-term results and tolerable toxicity although the weekly dosage of cisplatin and paclitaxel needs to be adjusted in the majority of the patients.

DOSIMETRIC DETERMINANTS OF VAGINAL STENOSIS IN CERVICAL CANCER HDR BT

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Purpose: Vaginal stenosis after cervical cancer BT is an unsolved problem and no dose constraints have been published so far. Aim of this study is to identify a threshold level for VP volume and a dose response curve for vaginal stenosis.

Materials: 124 consecutive CC patients were considered. All received standard RCT and 3D MR or CT based T-O HDR BT (554 fractions). Influence of VP volume on BT dose distribution to vagina was analyzed. In 85 patients, with controlled disease and >1 year follow up, the cumulative BT EQD2 dose to vagina was calculated. A Logistic Model (LM) was used.

Results: Average VP volume was 80.4±44.8 cm^3. A double exponential fit was noticed between vagina D80, D65, D50, D30 and VP volume, with a fast and a slow growing part. VP volume cut off values, dividing the two parts of the curve were encompassed between 70 and 80 cc. A correlation (R2=0.82 and 0.76 respectively) between VP and G2 and G3 vaginal stenosis was found. Risk of stenosis G3 was less than 5% when a VP volume >75 was obtained. Dose response curve for stenosis grater than G1 and vaginal EQD2 D80 (R2 0.96) D65 (R2 0.82) D50 (R2 0.68) and D30 (R2 0.89) was found.

Conclusions: To our knowledge this is the first study reporting a correlation between vaginal stenosis, VP volume and vaginal dose.

EFFECT OF RECTAL CONTRAST DURING GYNECOLOGICAL BRACHYTHERAPY

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Purpose: A rectal cleaning before VCB is usually recommended but some gynecological VCB trials have advised the use of rectal contrast in order to improve its visualization. No study has evaluated the dosimetric effect that such maneuver can produce. So we aim to analyze the effect of rectal contrast use during VCB.

Material and methods: A retrospective analysis of patients with at least one VCB fraction with rectal contrast was performed. Thirty-six patients were identified and their files were retrieved. All patients had an individual CT scan performed for and individual calculation at every VCB application. The VCB application with rectal contrast and the previous or posterior application without it were re-planned using the same parameters for the purposes of the study. Rectal DVH-derived metrics were analyzed (D0.1 cc, D1 cc and D2 cc) and compared with paired non-parametrical tests (Wilcoxon test).

Results: Mean rectal volume increased significantly with the presence of rectal contrast from 49.97 cc to 55.71 (p=0.02). Rectal contrast instillation increased significantly all rectal DVH metrics analyzed compared with the non-enhanced status (D0.1 cc, 7.02 Gy vs. 6.59 Gy, p=0.034; D1 cc, 5.82 Gy vs. 5.45 Gy, p=0.016; D2cc, 5.28 Gy vs. 4.89 Gy, p=0.009).

Discussion: Despite the small differences observed a significant increase of all dosimetric rectal parameters was observed. The explanation could be related with an increase on rectal volume. The study advises against this manoeuver in order to maintain doses at organs at risk as low as possible, especially when 3D images depict organs at risk without contrast instillation.

IMPACT OF DELAY IN RADIATION THERAPY AFTER SURGERY IN ENDOMETRIAL CANCER

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Objectives: To analyze the influence of the delay in the radiation therapy after surgery in terms of survival (disease free survival (DFS), overall survival (OS) and cancer specific survival (CSS), in patients with endometrial carcinoma (EC).

Material and method: Retrospective analysis of 352 patients with EC treated with surgery plus radiation therapy (EBRT) in our center between 1992 and 2010. Median age 63 years (35-86). The delay of radiation therapy was ≤9 weeks in 148 patients and >9 weeks in 204 patients. Baseline characteristic were similar in both groups. Predictive variables included age, tumor stage, histological grade and type, myometrial and linfovascular invasion, type of radiotherapy or surgery, lower third of the uterus involvement. Survival estimates were determined using Kaplan-Meier methods and Cox regression in the influence of prognostic factors in the results.

Results: The mean delay in EBRT was 46 and 101 days. The median follow-up was 120 months (7-264) and 116 (7-239). The 19-year DFS, OS and CSS were 84%, 49% and 84% and 82%, 37% and 82% respectively. In the multivariate analysis only the age and histological grade were independent prognostic factors in DFS and the age in OS.

Conclusions: In our experience, it seems that the delay in the radiation therapy after surgery does not affect the DFS or OS in patients with endometrial cancer.

IMPACT OF NODAL STAGING BY IMAGING IN ADVANCED CERVIX CANCER

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Objective: To study the impact of nodal disemination in advanced cervical cancer by computerized tomography (CT) and/or magnetic resonance (MRI) and/or Positron Emission Tomography (PET -CT) in disease-free survival (DFS), local failure-free survival (SLFL), overall survival (OS) and survival specific cause (SCA).

Material and methods: We studied 295 patients with advanced cervical cancer. Average age 54 years; Performance Status: 48 ECOG 0-1 and 47 ECOG2-3; 151 patients had FIGO≤ IIB and 144 FIGO>IIB; 164 patients were node-negative patients by imaging (G-), 83 positive pelvic node (GP +) and 48 positive para-aortic node (GPA +).

Results: Survival at 5 years were: SG: G- 75%, + 66% GP, GPA + 49% (p=0.007); SLE: G- 71%, GP + 64%, + 51% GPA (p=0.01); SLFL: G-83%, GP + 74%, + 66% GPA (p=0.04); SCA: 75% G, and GP + 69% + 51% GPA (p=0.01). Two multivariate studies for the SG and SCA were performed. In both of them para-aortic lymph node dissemination was an independent prognostic factor: Hazard Ratio (HR): 2.52, p=0.0031, HR 2.11 (p=0.02), respectively.

Conclusions: In univariate and multivariate analysis, para-aortic nodal disemination confers a worse prognosis for patients.

IN CERVICAL CANCER: THE TUMOR SIZE AFFECTS SURVIVAL?

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Objective: The aim of this study was determined the influence of tumor size on survival in patients with cervical cancer treated with concurrent chemo-radiotherapy (CCRT).

Material and methods: Between January 1994 and December 2014, 295 patients with locally advanced cervical cancer treated with CCRT were analyzed. The median age was 54 years (range, 25-85); 248 patients had ECOG 0-1 and 47 patients ECOG 2-3; 151 patients had stage IB-IIB (FIGO) and 144 patients had stage IIIA-IVA (FIGO). The tumor size was=6 cm in 116 patients (39.32%); 245 patients had histology of squamous cell carcinoma and 50 had adenocarcinoma and adenosquamous carcinoma. All received chemotherapy. Median follow-up was 60 months. Overall survival was estimated by the Kaplan-Meier method and the data were analyzed with long-rank test and Wilcoxon.

Results: The 5-year overall survival (OS), disease-free survival (DFS) and local failure-free survival (LFFS) were 69.4%, 63.89% and 76.93% respectively. In the log-rank test, the stage (p<0.0001) and ECOG (p<0.001) were significant prognostic factors for OS, DFS and LFFS. Tumor size was not statistically significant when analyzed with log-rank test (p=0.13) and in the multivariate analysis was not significant.

Conclusion: Tumor size does not influence in the prognosis of patients with cervical cancer treated with CCRT. While the FIGO stage and ECOG are factors that influence the OS, DFS and LRFS.

INFLUENCE OF BODY MASS INDEX (BMI) ON DOSES AT ORGANS AT RISK DURING VAGINAL CUFF BRACHYTHERAPY (VCB)

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Purpose: Body mass index (BMI) has been related with higher rectal doses on prostate brachytherapy. Our aim was to analyze the impact of BMI on VCT using CT scans at every fraction.

Material and methods: 220 CT sets derived from 59 patients were re-segmented and re-planned. Rectum and bladder DVH values (D0.1 cc, D1 cc and D2 cc) were extracted. Variables studied were: cylinder diameter, cylinder angle placement related to the cranio-caudal patient axis, rectum and bladder volume and, BMI. The mean values of all applications per patient were calculated. Univariate and stepwise multiple regression analysis were performed.

Results: Mean BMI 32.3 (±5.2). WHO class: 6.8% normal, 35.6% overweight, 57.6% obese class I. Mean cylinder angle 3.9º (±6.3º) toward rectum. Mean rectal doses: 133.2%, 109.6% and 98.3% for D0.1 cc D1 cc andD2 cc; bladder values: 96.8%, 80.1% and 73.4%. Obese patients were more frequently treated with large cylinders (p=0.037). BMI did not show any association with rectal doses. BMI was significantly associated with all bladder dose metrics (D0.1 cc, R2=0.1338, p=0.044; D1 cc, R2=0.2065, p=0.0003; D2 cc, R2=0.2034, p=0.0003). BMI was not among the predictors on multiple linear regressions for rectal dose metrics. BMI took part in the multivariate models for bladder dose (D0.1 cc, adj-R2=0.1186, p=0.0044; D1 cc, adj-R2=0.2354, p=0.0002; D2 cc, adj-R2=0.3154; p=0.0001), but not for rectal doses.

Conclusions: BMI was associated to lower bladder dose values and failed to be associated with rectal doses. The impact on late toxicity should be tested in clinical practice.

LOCALLY ADVANCED CERVICAL CANCER: (18) FDG PET-CT RESPONSE AFTER RADIOCHEMOTHERAPY.

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Background: Cervical cancer is leading cause of cancer-related deaths. Radiochemotherapy is the gold standard for the treatment of locally advanced disease. The role of ^{18}F-FDG PET-CT has been already study monitoring the response after therapy. To evaluate treatment response and correlates with clinical findings.

Material and methods: ^{18}F-FDG PET/CT was performed before and after radiochemotherapy in 40 patients with locally advanced cervical cancer (EIB2 to EIIIB). The maximum standardized uptake values (SUVmax) were recorded in the pre-treatment and at least 12 weeks post-treatment. Final response was determined clinically and was compared with functional imaging findings.

Results: Of 40 patients, 36 (90%) showed complete response as well as a clinical complete response. In the remaining 4 patients (10%) FDG uptake persisted correlating with residual clinical disease. The post-treatment SUVmax of complete responders were significantly lower than those of patients with residual tumor. PET/CT yielded a good negative predictive value.

Conclusions: Negative ^{18}F-FDG PET CT after radiochemotherapy is consistent and well correlates with clinical complete response. Complete metabolic response after radical radiochemotherapy may predict treatment outcomes. However, persistent cervical uptake may be caused by residual tumor or post-therapy inflammation, even 3 months after treatment completed.

LOCALLY ADVANCED CERVICAL CARCINOMA TREATED WITH RADIOCHEMOTHERAPY: OUR RESULTS

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Introduction: The treatment of locally advanced cervical carcinoma is concomitant chemoradiation followed by brachytherapy or surgery according to the response.

Objective: To identify results of overall survival (OS), disease-free survival (DFS), relapse-free survival (RFS), metastasis-free survival (MFS) and toxicity (RTOG) of locally advanced cervical cancer patients treated with radiochemotherapy.

Material and methods: Between 1998 and August-2014, 135 patients diagnosed of cervical cancer were analyzed retrospectively. External radiation therapy was administered on pelvic ± para-aortic, with parametrial boost if indicated (16.3%). Mean dose was 46.85 Gy, 1.8 Gy/d (34-75). All patients received concomitant chemotherapy. After treatment, 53.3% achieved complete response while 45.9% were partial responses. 77 patients (57%) were salvaged surgically and 65 (84.4%) received brachytherapy later. Mean and standard deviation for quantitative variables,

and absolute frequency and percentage for qualitative variables were obtained. The Kaplan-Meier method was used to estimate patient survival.

Results: The median duration of follow-up was 45.23 months (7.2-184.1). OS at 3 and 5 years was 79.6% and 64% respectively. DFS in the same periods was 65% and 61.5%. 20% patients had local disease recurrence and 23% metastases. RFS at 3 and 5 years was 80.8% and 78% respectively while MFS was 75.5% and 73%. Acute toxicity: urinary, 21.5% G1 and 8.9% G2. Gastrointestinal: 23% G1, 14.1% G2 and 3% G3. Late toxicity: urinary, 7.4% G1. Gastrointestinal: 2.2% G1-2.

Conclusion: Radiochemotherapy for locally advances cervical cancer providing good results in DFS and OS with good tolerance and low morbidity. Our results are similar to other historical series.

LONG-TERM RESULTS OF DAILY HDR-BRACHYTHERAPY IN POSTOPERATIVE ENDOMETRIAL CARCINOMA

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Purpose: To analyze the long-term results of daily high-dose-rate brachytherapy (HDRBT) in vaginal-cuff relapse (VCR) and toxicity in postoperative endometrial carcinoma (EC).

Material and methods: From January 2007 to September 2011, 154 patients were treated with HDRBT in FIGO stages: IA (39 p), IB (69 p), II (16 p), IIIA (13 p), IIIB (2 p), IIIC1 (10 p), IIIC2 (5 p). Pathology: 130/154 endometrioid adenocarcinoma and 24/154 other types. Radiotherapy: Group 1: 94/154 external beam irradiation (mean 45 Gy, range 44.0-55.4)+ HDRBT (2 fractions/5-6 Gy); Group 2: 60/154 HDRBT alone (4 fractions/5-6 Gy). Chemotherapy: 26/154 patients. Toxicity evaluation: RTOG scores for bladder and rectum and the objective criteria of LENT-SOMA for vagina. Statistics: Chi-square and Fisher exact tests.

Results: Mean age (years): Group 1: 65.1 (40-88), Group 2: 61.9 (39-90). Mean follow-up (months): Group 1: 52.4 (9-86); Group 2: 56.1 (12-105). VCR: Only 2 patients in Group 1 (2.12%) and no patients in group 2(0%). Toxicity: Group 1 - early problems (all G1-2) in rectum (5.3%), bladder (7.5%) and vagina (2.1%) vs. late in rectum (7.3%, all G1-2 but 1 G3), bladder (1.1%, G1) and vagina (27.7%, all G1-2 but 1G4). Group 2 -early toxicity (all G1-2) in bladder (6.7%) and vagina (6.6%); late toxicity was only vaginal (21.6%, G1-2). Significant differences were only found in rectal toxicity between both groups (p=0.004).

Conclusions: The present brachytherapy schedule consisting in 2 fractions/5 Gy after EBI and 4 fractions/5 Gy administered daily is a safe regime in terms of local control and toxicity for postoperative EC. Similar results were found in a previous series with an increased number of fractions.

Grant: AECC Foundation.

METASTASIS TO THYROID GLAND FROM CERVIX CANCER: TREATMENT OF OLIGOMESTASTASIS

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Introduction: The most frequently observed metastatic sites from cervix cancer are the lung (21%), paraaortic lymph nodes (11%), abdominal cavity (8%) and supraclavicular lymph nodes (7%) and bone metastases (16%). Metastatic carcinoma of the thyroid gland is uncommon. Patients who develop distant metastases, either at initial presentation or at relapse, are rarely curable. The interval between the primary tumor and the metastatic spread is usually less than 2 years.

Case report: We describe a case of a 49 year-old patient diagnosed with poorly differentiated squamous cell carcinoma of the uterine cervix in 2006. She was treated with radical chemo-radiotherapy. Four years after she developed a single lung metastases. Chemo-radiotherapy was performed obtaining complete response. In 2012, positron emission tomography/computed tomography (PET/CT) revealed hypermetabolic nodule in the right lobe thyroid and a hypermetabolic loco-regional lymph node without other metastatic lesions. The biopsy from lymph node and nodule confirmed a poorly differentiated epidermoid carcinoma from uterine cervix. The patient refused surgery and radical chemo-radiotherapy was proposed. After 20 months of follow-up, the patient remains in complete response.

Conclusions: The case illustrate an oligometastatic cervix cancer and an uncommon site of metastases to the thyroid gland. An intensive treatment based on chemo-radiotherapy regimens results in an effective tool to control the metastatic disease.

MR-BASED IGABT FOR CERVICAL CANCER: DOSIMETRIC AND CLINICAL EARLY RESULTS

Federico, M.; Tornero, A.M.; Torres, S.; Hernández, C.R.; Rey Baltar, M.D.; Arencibia, O.; Benito, V.; Lloret, M.; Lubrano, A.M.; Lara, P.C.

Aim: An increasing number of publications indicate MR based IGABT as new gold standard in cervical cancer treatment.

Materials: From December'12 to December'14 71 consecutive unselected patients with diagnosis of locally advanced cervical cancer (4 AC, 67 SCC) were studied; all patients had pelvic MRI, PET-scan and CT as diagnostic workout. 5 had FIGO stage Ib1, 4 Ib2, 1one IIA, 28 twenty-eight IIB (mid proximal parametrial invasion), 12 IIB (distal parametrial invasion), 1 one IIIA, 13 IIIB, and 7even IVA stage cancer. All patients had retroperitoneal lymphadenectomy, and received radio-chemotherapy consisting 3DCRT (45 Gy in 25 fr) with concomitant cisplatin. Nodal boost was delivered on affected limphnodes. BT consisted of 4 MR-based IGABT fraction of 7 Gy under ultrasound guidance.

Results: With 2 y. follow up we had 2 local persistent disease; 0 Local Relapses; 1 Isolated Nodal Relapse and 15 Systemic relapses.

Conclusions: MR based IGABT allows outstanding local and locoregional control in cervical cancer patients. Probably, given the excellent pelvic control we have seen so far an increased incidence of distant failure. Based on these preliminary data we have change have considered to add adjuvant chemotherapy after complete radiochemotherapy in all patients with disease more advanced than IB2.

NOMOGRAM PREDICTING THE RISK OF DISTANT METASTASES IN POSTOPERATIVE CERVICAL CANCER

Laria Font, C.; Corral Delgado, S.; Paredes Rubio, S.; Castaño Zuleta, F.A.; Bascón Santaló, N.; Velilla Millan, C.; Lopez Mata, M.; Bellosta Ferrer, R.

Cervical cancer is the second most common diagnosed malignancy in worldwide women. It ranks as the fifth most prevalent neoplasm in Europe females. The radical hysterectomy followed by adjuvant treatment with radiotherapy or chemotherapy may be a therapeutic option for patients with early stages. Korean Radiation Oncology group has developed a nomogram that predicts the risk of distant recurrence in these kind of patients, so this nomogram consider the deep stromal invasion, histological type, number of affected lymph nodes and parametrial invasion. Our

study aims validation in no Korean women. We have collected 20 patients retrospectively. The median age is 54 years. This women were diagnosed to uterine cervical cancer (FIGO stage IA to III) in which hysterectomy and adjuvant cancer treatment was performed. With a median follow-up of 5 years, only 30% of distant metastases were detected. 100% of patients with scores nomogram between 70% and 40% developed metastasis. Only 23% of patients with punctuations>90% developed distant metastasis. In order to incorporate this nomogram in our clinical practice, will be necessary a study with a higher number of patients.

OAR INTRAFRACTION/INTERFRACTION DOSE VARIABILITY IN TANDEM-OVOIDS BRACHYTHERAPY FOR CERVICAL CANCER

Alonso, D.; Marbán, M.C.; Federico, M.; Torres, S.; Tornero, A.M.; Pinar, B.; Ramírez, I.; Lara, P.C.

Background: To estimate intra- and inter-fraction HRCTV and OAR dose variability in two consecutive day IGABT fractions in cervical cancer intracavitary-interstitial MR/CT-based BT.

Material and methods: 45 cervical cancer patients treated were considered: 4 of them had FIGO stage IB, 33 had IIB, 7 had IIIB tumors and 1 had IVA tumor. All patients had 3DCRT (45 Gy in 25 fr) with concomitant cisplatin, followed by MR/CT based IGABT (4 fractions of 7 Gy within 2 insertion) MRI and contrasted CT with applicator in place were performed. Direct applicator reconstruction on MR images was performed, and dose optimized and OAR delineated. Original MR and CT datasets were fused and HRCTV contours from MR transferred to CT. Further OARs were re-delineated on day-1-CT, applicator reconstructed and the original MR optimized plan recalculated on CT images. Day-2-CT was fused with day 1 CT on the applicator coordinates and the original MR-based HRCTV contours transferred from day-1-CT to day-2-CT. OAR were then delineated on day-2-CT and the original MR optimized plan recalculated on day-2-CT images. DVH parameters for OAR delineated on day-1-CT and day-2-CT were recorded.

Results: The magnitude of intra- and inter-fraction variability is very low in most of the patients. Intra- and inter-fraction HRCTV and OAR variability is similar.

Conclusions: Presented data suggest that in a protocol of four fractions within 2 different applications no re-planning is needed to safely deliver the second BT fraction if an OAR filling protocol is applied.

OBSERVACIONAL STUDY OF VAGINAL TOXICITY TREATED WITH TECTUM AFTER BRACHYTHERAPY IN PATIENTS WITH GINECOLOGICAL CANCER

Bezares Alarcon, A.; Serradilla Gil, A.; Ramos Trujillo, A.; Ristori Sola, A.; Mata Fernandez, M.; Rodriguez Lopez, M.I.; Luque Campuzano, C.

Introduction: One of the side issues in the treatment of gynecological tumors with brachytherapy is the appearance of vaginal late toxicity that determines the occurrence of stenosis.

Objectives: Study the occurrence of vaginal medium term toxicity in patients in topical support treatment with TECTUM.

Material and methods: Monitoring was performed for 6 months in 5 patients treated with brachytherapy in our clinic. Once the treatment has ended it was prescribed vaginal TECTUM every 12 hours with vaginal dilators. Monthly reviews were performed in all cases.

Results: Median age was 57 (42-62) years. Only one patient had cervical cancer treated with external radiotherapy with concomitant chemotherapy. The other patients had endometrial cancer and received surgical treatment and external radiotherapy plus brachytherapy (one received chemotherapy before radiotherapy).

We assessed vaginal toxicity following the GICOR guides "Practica Clínica en Oncología Radioterápica" in mucositis, vaginal dryness, stenosis, dyspareunia and vaginismus.

Conclusions: TECTUM shows promising results in controlling vaginal toxicity. However it requires studies with larger numbers of patients and longer term.

PET/CT AFTER EXTERNAL RADIOTHERAPY, PROGNOSTIC UTILITY

Paredes Rubio, S.; Castaño Zuleta, F.A.; Laria Font, C.; Corral Delgado, S.; Bascón Santaló, N.; López Mata, M.; Bellosta Ferrer, R.

Introduction: The PET/CT is a useful test in early assessment of tumoral response at cellular biochemical level, which precedes the clinical response assessed by imaging or physical examination and may predict the subsequent development of cervix cancer patients undergoing concomitant chemotherapy -radiotherapy.

Material and methods: We included patients with cervix cancer treated in our service since 2009 who were studied by PET/CT after external radiotherapy with concomitant chemotherapy and prior to brachytherapy.

Results: 23 patients were considered, with an average age of 53 years, IB2 to IVA, 91.3% of the cases were squamous cell carcinoma ones. In the PET/CT 17.4% showed local disease, 4.3% adenopathies and 78.3% full response. Currently, 65.2% of the patients are free of disease, 8.7% are alive but diseased and 26.1% died. Overall survival was 48.5 months. Recurrence-free survival was 46.06 months. Among those who experienced complete response in the PET/CT survival was 55.07 months. And among those who responded partially was 25.91 months. According to the PET/CT results 22% of those who experienced complete response relapsed. By the other hand 80% of those with incomplete response relapsed.

Conclusions: A correlation between PET/CT results and progress of the patients is observed, although it would be advisable to increase the number of cases in order to obtain more conclusive results.

POSTOPERATIVE CONCURRENT RADIOCHEMOTHERAPY IN HIGH-RISK CERVICAL CANCER

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Purpose: The aim of this study is to investigate the impact on survival of postoperative concurrent radiochemotherapy in high risk-early-stage cancer of the cervix.

Patients and methods: Between 2000 and 2012, 34 patients (p) with clinical stage IB1 (76.5%), IB2 (20.6%) and IIA1 (2.9%) uterine cervical carcinoma (squamous (73.5%)) were treated with radical histerectomy and pelvic lymphadenectomy (82.4%) and due to had positive pelvic lymph nodes (61.8%) and/or positive margins (32.4%) and/or microscopic involvement of the parametrium (52.9%), these received concurrent radiochemotherapy treatment (Intergroup study). Others prognostic factors were pathological lesion size (>4 cm 32.4%) and tumor in lymph-vascular channels (38%). 11 p received external pelvic radiotherapy(49.3 Gy in 29 fractions) and 23 p extended-field radiation (45 Gy in 30

fractions) if pelvic and/or para-aortic lymph nodes were positive. Low dose rate brachytherapy (LDRB) was realized after external radiotherapy.

Chemotherapy consisted of bolus cisplatin 70 mg/m^2 and a 96-hour infusion of fluorouracil 1,000 mg/m^2/d every 3 weeks for four cycles, with the first and second cycles given concurrent to RT and with the third concurrent vaginal vault LDRB.

Results: With a median follow-up time of 80 months, 5/10-years overall, disease-free and local relapse-free survivals were 91%/79%, 87%/83%, and 91%/91%, respectively. The incidence of recurrences was 15% (2 p developed a local recurrence in the irradiated field-the only site of progression, 1 p (3%) with synchronous distant metastasis and 2 p (6%) distant metastasis). Local recurrences happened before 40 months follow-up. 10 years cancer specific survival was 91% (3 p).

Conclusion: An excellent survival is obtained with concurrent radiochemotherapy (Intergroup study scheme) in the high risk cervical cancer.

PROGNOSTIC FACTORS AFTER POSTOPERATIVE RADIOTHERAPY IN STAGE I-III UTERINE CARCINOSARCOMAS

Castilla Bancayán, L.G.; Rovirosa, A.; Oses, G.; Holub, K.; Ascaso, C.; Arenas, M.; Ríos, I.; Del Pino, M.; Pahisa, J.; Biete, A.

Purpose: To analyse the impact of prognostic factors on specific overall survival (SOS) after postoperative radiotherapy (P-RT) in carcinosarcomas (CS).

Materials and methods: From 1977 to 2010, 81 patients (pts) received P-RT. Surgery: Total Hysterectomy + Salpingoophorectomy: 81 pts, 66 pts also underwent pelvic lymphadenectomy, 11pts Para-aortic lymphadenectomy and 10pts ommentectomy Stage (Figo 2009): 25-IA, 20-IB, 6-II, 9-IIIA, 11-IIIC. Radiotherapy: Exclusive vaginal-cuff brachytherapy (VBT): 4 pts. Exclusive pelvic external beam irradiation (EBI): 14 pts. EBI+VBT: 63 pts. Postopertative chemotherapy: 10 pts (carboplatin/paclitaxel). Prognostic factors analysed: Age, stage, tumour size, MI, mitotic index, epithelial component, sarcomatous component, vascular and lymphatic space invasion, necrosis and grade. Statistical analysis. Kaplan-Meier method for survival analysis and the Cox model for evaluation of risk factors.

Results: Mean follow-up (months): 78.86 (7-381), Median age (years): 72 (51-89). Relapses: Relapsed and died: 30/81 (37%); pelvic and abdominal: 19/81(22%), in vagina ± pelvic mass in 10/19 (52%), in lymph nodes in 4/19 (21%) and carcinomatosis in 6/19 (31.7%). Distant metastasis: 22/81 (26.9%), mainly in lung (13.5% were the exclusive site of relapse). 43% died during the first year, 53.3% during the second year and 3.4% after the 4th year. SOS at 2 and 5 years: 66% and 55% for the entire series, 72% and 66% for stage I-II and 37% and 30% for stage III. The Cox model only showed significant differences for stage.

Conclusions: Two groups of patients with different outcomes were found P-RT in CS. Stage I-II pts had a 2.5-fold longer life expectancy compared to stage III pts.

PROGNOSTIC FACTORS IN TREATMENT RESULTS IN PATIENTS WITH ENDOMETRIAL CANCER

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Objectives: To analyze the influence of prognostic factors in treatment results in term of survival in patients with endometrial cancer (EC).

Material and methods: Retrospective study of 401 patients with EC treated in our center from september 1992 to august 2010. Median age 63 years (32-86). 90.7% underwent total hysterectomy plus bilateral adnexectomy with or without pelvic lymphadenectomy. 81% of the patients were stage I-II. Endometriode adenocarcinoma (68%) was the most frequent histological type. 70% of the patients received external-beam radiation therapy (EBRT) plus brachytherapy (BQT). Predictive variables included age, tumor stage, histological grade and type, myometrial and linfovascular invasion, type of radiotherapy or surgery, lower third of the uterus involvement. Survival estimates were determined using Kaplan-Meier methods and Cox regression in the influence of prognostic factors in the results.

Results: With a median follow-up of 113 months (6-264). 12% of the patients had recurrence, 7% distance metastases and 2.7% local relapse. The 20-year DFS, OS and CSS were 82%, 43% and 82% respectively. In the multivariate analysis only the age and histological grade were independent prognostic factors in DFE and the age and myometrium invasion in OS.

Conclusions: In our experience, age, histological grade and myometrial invasion were independent prognostic factors in survival results in patients with endometrial cancer.

PROSPECTIVE STUDY OF MRI-GUIDED BRACHYTHERAPY AND 3D/IMRT RADIOTHERAPY IN CERVICAL CARCINOMA

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Purpose: To evaluate dosimetric and clinical findings of MRI-guided HDR brachytherapy (HDR-B) for cervical carcinoma.

Material and methods: From 2008 to 2014: 50 patients. All patients had a CT, MRI and pelvic-paraaortic lymphadenectomy. Treatment: pelvic (±) para-aortic3D/IMRT radiotherapy (45 Gy) and weekly cisplatin followed by HDR-B and pelvic node/parametrial boost 60 Gy. Two implants at week 6th and 7 th were done: 5 fractions of 6 Gy and from 2011 4 fractions of 7 Gy. MRI/TAC was done in each implant. There where defined: GTV, CTH-HR, CTV-IR; OAR: rectum, bladder and sigmoid.

Results: Patients: T1b2-T2a: 3p, T2b 36p, T3a: 2p; T3B 9p; N0: 31p, N1 19p. With a median follow up of 50.6 months(8.1-89.2 months), 5 patients had local recurrence, 6 lymph node recurrence, 6 distant metastasis and 36 without recurrence. Local control at 5 years was 88%; Ib2-IIB: 93%, III: 70%. (p:0.07). Lymph node RDFS 5 y was 88%; IB2-IIB: 89%, III: 83% (p:ns); for pN0: 94%; pN+ iliac-paraaortic: 77% (p: 0.08). Metastasis FS 5 y was 78%; IIBN0: 78%, IIBN1: 89%, III: 63%. Overall survival(OS) at 3 years was 82% and at 5 years was 63%; IB2-IIB 5 yr: 70%; III 5 yr: 27% (p: 0.01); For pN0 5 yrs 74%; pN+ iliac-paraortic 5 yr: 45% (p: 0.03). Dosimetric parameters: D90 6 Gy: 90% (p:ns); OS: D90 6 Gy: 67% (p:ns). D2 cc-Sigma: 1.7-6.2 Gy (md 3.8 Gy); D2cc-rectum: 2-6.1 (md 4.2); D2 cc-bladder 3.4-5.7 (md 5.25).

Conclusion: Use of intersticial HDR-BQ guided by RM increased CTV-HR dose and local control, like EMBRACE results. Nodal boost improves RDFS and perhaps OS.

PROSTATE CANCER MANAGEMENT AFTER RADICAL SURGERY AT RADIATION ONCOLOGY DEPARTMENTS

Gómez-Caamaño, A.; Zapatero, A.; López-Torrecilla, J.; Maldonado, X.

Objectives: To define patterns of clinical practice in prostate cancer (PCa) patients regarding adjuvant or salvage postopera-

tive radiotherapy (PRT) and describe their evolution in radiation oncology departments.

Materials and methods: Epidemiological, cross-sectional, retrospective and multicentre observational study from 567 patients with PCa and risk of relapse that underwent radical prostatectomy (RP) and PRT in 2006 and 2011. Health-related quality of life was assessed by EPIC questionnaire. For the study of clinical practice, investigators completed a specific questionnaire-based survey consisting in two clinical cases of adjuvant and salvage PRT.

Results: 70.6% of patients received salvage and 29.4% adjuvant RT; no significant differences were found in 2006 vs 2011 in each procedure in daily clinical practice. In the survey, a positive surgical margin was the main pathological criterion to select adjuvant PRT. In the salvage PRT scenario, 85.7% of investigators stated that adjuvant RT should have been offered, 81.4% agreed on PSA score>0.2 ng/ml as the main criterion for biochemical recurrence after RP and 67.4% did not consider any PSA cutoff for ruling out salvage RT.

Conclusions: Most patients are referred to radiation oncology departments for receiving salvage RT. Despite the publication of 3 randomized clinical trials, the pattern of adjuvant and salvage RT has not changed. 85.7% of specialists considered use of adjuvant instead of salvage RT in patients with high risk factors for biochemical recurrence. Indications for postoperative RT should be made in multidisciplinary consensus to correct this controversial situation.

PROTRACTED HDR-BRACHYTHERAPY IN POSTOPERATIVE ENDOMETRIAL CANCER: EQD23 GY VAGINAL TOXICITY STUDY

Kolub, K.; Rovirosa, A.; Castilla, L.; Oses, G.; Herreros, A.; Camarasa, A.; Arenas, M.; Sabaté, S.; Valduvieco, I.; Biete, A.

Purpose: To correlate the vaginal toxicity to vaginal surface EQD23 Gy dose in two protracted brachytherapy(BT) schedules administered after surgery for endometrial carcinoma(EC).

Patients and methods: 319 patients (p) with 2009-Figo I-IIIC EC. The treatment schedule for 166 p (2003-2007) was 3 fractions (f)/week(w) of 4-6 Gy after external beam irradiation (EBI) (Group-1:125p) and 4-6 Gy in 6 f/2 w for BT-alone (Group-2:41 p). From 2007-2011 the daily dose schedule in 94/153 p was 2 f/w of 5-6 Gy after EBI (Group-3) and 5-6 Gy in 4f in BT-alone (Group-4:59 p). Toxicity evaluation: the objective criteria of LENT-SOMA. In Groups 1+3: the sum of EBI+BT was performed for the EQD23 Gy analysis. Statistics: Chi-square, Fisher and Student's-t tests.

Results: Mean follow-up: Group-1:68.08 months (m) (7.73-123.13); Group-2:63.41 m (21.2-108.56); Group-3:47.51 m (8.64-82.14); Group-4:48.08 m (19.23-96.66). Median overall BT treatment time: Group-1: 5 days (d) (3-23); Group-2: 13 d (8-28); Group-3: 2 d (2-12); Group-4: 6 d (4-15). Vaginal-cuff-relapses (VCR): 5/320 p, 1.56%. Late Toxicity: Vagina: Group-1: 20.8% G1-2; 0.8% G4. Group-2: 24.4%; Group-3: 26.6% G1-2; 1.1% G4. Group-4: 20.0% G1-2. No differences were found between the two treatment schedules (p=0.680) and between Groups-1+3 vs. Groups-2+4 (=0.667). The overall percentage of G1-G4 toxicity for Groups 1-4: 23.4%. Mean vaginal surface EQD23 Gy: Groups 1+3: 90.02 Gy, SD 13.72; Groups 2+4: 79.83 Gy, SD 23.66, (p<0.0001). Nevertheless, no correlation was found between the vaginal surface EQD23 Gy and the development of vaginal complications.

Conclusions: No differences were found in VCR and toxicity between the 2 BT schedules. No correlation was found between vaginal toxicity and vaginal surface EQD23 Gy for the present dose per fraction schedules.

RADIOTHERAPY IN LEIOMYOSARCOMAS STAGE I-IIIB: 33 YEARS OF EXPERIENCE

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Purpose: To evaluate the 5-year outcome of uterine leiomyosarcoma (LMS) cancer in patients (p) treated at our hospital over a 33-year period.

Materials and methods: From 1970 to 2012, 40 p with 2009 FIGO stage I-IIIB LMS were treated. Surgery: Total hysterectomy (40 p), pelvic plus para-aortic lymphadenectomy (5 p) and 4 p also underwent ommentectomy. Radiotherapy (RT): external beam irradiation (EBI) was administered in 22 p brachytherapy (BT) was added in 18 p, and exclusive BT in 1 p. Postoperative chemotherapy was administered in 13 p with different schedules. Statistical analysis: Kaplan-Meier method and the Cox model for survival analysis.

Results: Median age: 55y (27-93). Stage and pathologic sample description: stage: 7-IA, 23-IB, 1-IIA, 3-IIB, 1-IIIA, 5IIIB; Mean tumour size: 10.84(4-26); High mitotic index: 31 p; necrosis: 28 p; vascular and lymphatic space invasion: 8 p. Mean and median follow-up of the series in months (m): 36.62 m and 41.00 m, respectively. Relapses: vaginal (4 p); pelvic (12 p) and both (16 p). Distant metastasis appeared in 22 p mainly in lung (the exclusive site of relapse in 7 and the rest were associated with local relapse). The specific overall survival (SOS) of the entire series at 2 and 5 years(y) was 71.20% and 57.70%, respectively. SOS at 2y and 5y. Stage I: 80% and 61%, stages II-IIIB: 50%; Comparing RTp vs. no RTp: 85.00% and 68.00%, 54.80% and 42.30%, respectively. The mean SOS: 42.88 m (35.52-50.23), RTp: 48.96 m (41.13-56.79) and no RTp: 34.22 m (21.58-46.87).

Conclusions: The SOS of LMS at 5 years was 57.70%. Despite the high incidence of bad prognostic factors RT showed a benefit in survival.

RECTOVAGINAL AND VESICOVAGINAL FISTULAS. RADIOTHERAPY FOR CA CERVIX. DOSIMETRIC CORRELATION

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Objective: To report the incidence of recto-vaginal (RVF) and vesico-vaginal fistula (VVF) in our center to patients with Cervical Cancer treated with radiotherapy and ist relation to dosimetry.

Material and methods: 111 patients were treated between 2007 and 2013. 44 with postsurgical radiotherapy and 67 patients with radical chemo/radiotherapy. 90% of patients with squamous cell histology, 10% adenocarcinoma. Frequently stages: 18% IB1, 41% IIB, 23% IIIB. Average tumor size 4.03 cm. 39% of patients had pelvic lymph nodes affected. The treatment after surgery was 45 Gy with external radiotherapy in pelvis plus two brachytherapy sessions of 5.5 Gy each. Chemo/radiotherapy: 45 Gy pelvis (concurrent cisplatin weekly) plus 4 applications 7 Gy each one at point A. Mean follow-up of 36 months. Brachytherapy dose limits for rectal application: mean dose <75% of prescribed dose (PD) and no points above the 100% PD. Bladder: mean dose <80% of PD and no points above the 100% PD.

Results: We recorded 2 cases (5%) with VVF in patients with postoperative radiotherapy. In patients with radical radiotherapy: 3 cases (4%) RVF and 2 (3%) with VVF. In total 22 patients exceeded the blader dose-limiting and 40 patients the rectum dose-limiting, in any application. The incidence of fistula is analyzed with the presence of this over dose limiting measures without getting any signification.

Conclusion: In our series, the mean dose and hot spots in rectum and bladder maintains not significant correlation with the appearance of FRV or VVF.

RETROSPECTIVE STUDY OF ADJUVANT RADIOTHERAPY FOR EARLY STAGE UTERINE SARCOMA

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Uterine sarcomas are a heterogeneous group of rare uterine neoplasms. They typically involve an early dissemination and a poor survival. We review the treatment results by tumor histology in stage I and II.

Material and methods: Forty patients were treated at our hospital with external radiotherapy (ERT), brachytherapy (BT) or both from 2003 to 2014. All the patients underwent surgery of the primary tumor as first treatment. The median age was 65.3 years. The tumor histology was carcinosarcomas (CS) (70%), leiomyosarcomas (LM) (22.5%) and endometrial stromal sarcomas (EES) (7.5%). The staging in these patients was 60% at stage I, 12.5% at stage II, 20% at stage III and 7.5% at stage IV. Stage III/IV, EES, and two patients with residual disease were excluded from the analysis.

Results: Adjuvant chemotherapy was delivered in 63.2% of CS and 100% of LM. Mean time between surgery and RT was 5.2 months. Adjuvant ERT was performed in 89.5% of CS, with sequential BT in 68.4%, and only BT in two patients. All LM (8) received ERT with sequential BT in 3 patients. The median follow up was 37´9 months, with 8 patients lost. We have found an absolute local relapse rate in CS of 5.2% and an absolute distant failure rate of 26.3%. LM had no local relapse and 28.5% had distant failure.

Conclusions: Adjuvant radiotherapy promotes satisfactory local control rates but distant relapses remain as the main oncologic problem.

ROLE OF INTRAOPERATIVE RADIATION THERAPY IN CERVICAL CANCER RECURRENCE

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Introduction: Local recurrence rate in advanced stages cervical cancer (IIb-IVa) is from 25 to 60%. Pelvic exenteration is the treatment for these patients. When pelvic wall is affected, curative resection is minimal. Intraoperative radiation therapy with electrons (IOERT) may be administered in a well-defined surgical area. Moving neighboring structures outside the radiation field, the toxicity of the tumor surrounding tissues decreases. Combination of IORT with maximal tumor resection may benefit these patients.

Case report: Twenty-four years old female with squamous cervical carcinoma G2. MRI showed a 6.2 cm cervical tumor infiltrating the upper third of vagina (FIGO IIIB-IVA). In December 2013, a para-aortic lymphadenectomy for staging was done without evidence of disease. She began chemotherapy (weekly CDDP) concomitant with external radiation therapy (TD: 50.4 Gy) and complete gynecological brachytherapy PDR (HR 30 Gy), which ended in March 2014, with complete response. In October 2014 developed pelvic pain. MRI showed a 3.8 cm tumor recurrence with right parametrial infiltration. In December 2014 pelvic exenteration, IOERT, urinary diversion (Indiana type) and vaginal reconstruction were performed. IORT was delivered on the right parametrial bed (infiltrated in MRI) and left parametrium (surgical infiltration), with pelvic nerves protection. Administered dose 12.5 Gy (90% isodose pattern).

Conclusions: Surgical treatment of pelvis recurrent disease is limited by obtaining surgical free margins. IORT can deliver an additional dose of irradiation on a well-defined area, which is considered a high risk of local recurrence.

SEQUENTIAL WHOLE ABDOMINOPELVIC IRRADIATION IN ADVANCED STAGE ENDOMETRIAL CARCINOMA

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Purpose: To evaluate postoperative whole abdominopelvic irradiation (WAPI) in patients with FIGO Stage III and IV endometrial carcinoma.

Methods and materials: Between 2003 and 2014, 47 patients treated with extended surgery and adjuvant chemotherapy received sequential WAPI at our institution. The mean age at diagnosis was 61 years (range 44-78). 31 patients (66%) had FIGO Stage III and 16 (34%) had Stage IV. The average duration of WAPI was 44 days. The scheme used was 22.5 Gy (15 fractions of 1.5 Gy) in a first phase, which includes WAPI, and a second phase of 23.4 Gy (13 fractions of 1.8 Gy) to pelvic volume with or without para-aortic nodal volume.

Results: Mean follow-up was 44 months. The median disease-free survival (DFS) after WAPI was 32 months (27 patients). 20 patients (43%) had a relapse that could be rescued with chemotherapy. 46 of 47 (98%) were reliable to complete the protocol as prescribed. 27 patients presented grade I-II gastrointestinal toxicity, 16 grade I-II asthenia. The remaining patient was unable to complete treatment due to thrombocytopenia grade III. Chronic toxicity with clinical impact was described in one patient (with a history of two non-oncological previous abdominal surgery) presenting an intestinal obstruction which was resolved surgically.

Conclusion: Sequential WAPI is an effective treatment for advanced endometrial carcinoma, with good rates of DFS and unfrequented chronic toxicities.

SIX-YEAR OUTCOME OF CONCURRENT CHEMORADIOTHERAPY IN CERVICAL CANCER

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Purpose: To assess the clinical outcomes after concurrent cisplatin chemotherapy and radiotherapy (RT) followed by brachytherapy for carcinoma of the cervix in our hospital.

Methods and materials: A cohort of 62 patients (median age 54.5) with FIGO stage IB1-IVA cervical cancer who were treated with concurrent chemoradiotherapy followed by brachytherapy boost between January 2008 and December 2014 were analysed. Patients received definitive (53.2%) or adjuvant (46.8%) treatment with weekly intravenous cisplatin (40 mg/m^2) concurrent with daily external beam radiotherapy (EBRT) to pelvis of 45-50 Gy followed by low/high dose rate brachytherapy boost. Local control rate (LC), overall survival (OS) and treatment related toxicities graded by the RTOG criteria were evaluated.

Results: The median follow-up period was 25 months. Of 62 patients, the LC rate was 68.2%, and the OS rate 73%. Acute G3 toxicities were seen in 4.8% (hem), and G1- G2 in 83% patients.

Late toxicities occurred in 84.3% (G0, G1), 7.9% (G3), 6.3% (G4) and 1.5% (G5, intestinal obstruction) patients.

Conclusions: The efficacy of concurrent chemoradiotherapy in the treatment of cervical cancer is well established. The results in this cohort were similar like other published series.

STAGING IN CERVICAL CANCER AS A PROGNOSTIC FACTOR

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Introduction: Tumor staging in cervical cancer has undergone changes over time. The use of lymphadenectomy as staging method allows defining more precisely the volume to be treated. Better staging of the disease allows a correct selection of the patients and indication of radical or palliative treatment.

Purpose: To analyze the impact of different ways of staging the disease progression and survival of our patients.

Material and methods: From 1999 to December 2013, 401 patients were recruited. We analysed 295 patients treated with radiotherapy and concurrent weekly cisplatin; the remaining 105 patients were excluded for: presence of metastasis at diagnosis, positive HIV, pregnancy, neoadjuvant chemotherapy or different from cisplatin, surgery and other synchronous tumors. Median age was 54 years. 186 were staged by Computed Tomography (CT) or Magnetic Resonance Imaging (MRI), 71 by Positron Emission Tomography-CT (PET-CT) and 38 by para-aortic lymphadenectomy and diagnostic imaging test. For the analysis were classified according to FIGO IIB (144). 83 patients had a positive pelvic lymph node; 48 para-aortic lymph node with or without pelvic, and 164 lymph node negative.

Results: The time between the pathological diagnosis and initiation of radical treatment varies according of the method of tumor staging. With CT/MRI was 53 days, with PET-CT was 60 days and para-aortic lymphadenectomy was 90 days ($p<0.001$).

Conclusion: The staging method used, had no significant impact on survival. In patients were staged by lymphadenectomy, the delay time was significantly higher.

STANDARD UPTAKE VALUE IN ADVANCED CERVICAL CANCER AS A PROGNOSTIC FACTOR

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Hypothesis: Does SUVT could be poor prognostic factor in patients with advanced cervix treated with radiotherapy (RT) and concurrent cisplatin cancer?

Material and methods: The simulation with 18 FDG PET-CT was incorporated into our clinical practice in February 2009. By this technique are simulated 102 patients, with a mean age of 56 years. For statistical analysis we grouped the patients according to the classification FIGO stages *in FIGO IIB ≤ (n=64) and FIGO>IIB (n=38). After simulation with PET-CT 40 patients were free of lymph node involvement (N0), 46 had pelvic involvement (N1) and 16 had paraaortic involvement (N2) with or without pelvic involvement.

Results: The average value was 15.62 SUVT (p25: 10.1, p50: 15.39, p75: 64). No relationship was found between the value of SUVT of patients FIGO IIB ≤ and > IIB. Yes there is statistical significance between lymph node imaging and SUVT: N0: average SUVT 12.67 (p25: 7.9, p50: 12.7, p75: 16.7); N1: SUVT average 17.8 (p25: 13.1, p50: 17.9, p75: 22); N2: SUVT average 16.7 (p25: 9.4, p50: 16.7, p75: 21.4), ($p=0.0031$). The value of SUVT did not influence survival as a continuous variable or as a variable dichotomized (16). Only FIGO stage and lymph node imaging have prognostic significance.

*FIGO Staging: IB1: 5, IB2: 19, IIA: 5, IIB: 35, IIIA: 1 IIIB: 33 VAT: 4.

SYSTEMIC CHEMOTHERAPY FOLLOWED BY RADIO OR RADIOCHEMOTHERAPY IN CERVICAL CANCER

Calvo Tudela, A. Villaescusa Molina, A. Gálvez Montosa, F.; Castillo Pérez, I.; Jurado García, J.M.; García Puche, J.L.

Background: At the beginning of the investigation, the use of neoadjuvant chemotherapy in locally advanced cervical cancer was reserved for those cases where the application of radiotherapy meant an unacceptable delay. Despite encouraging results obtained in different studies can not be considered a standard to this day. It is imperative to explore new combinations of therapies to provide a new approach in the neoadjuvant treatment of locally advanced cervical cancer.

Methods: This exploratory study evaluated 53 patients with locally advanced cervical cancer treated with neoadjuvant chemoradiotherapy based in cisplatin treated between 1996 and 2012. The stage was IB and IIIB with different histological types.

Results: Patient's characteristic were: Median age was 46.9 years; all females; epidermoid 75.5%/adenocarcinoma 20.7%/undifferentiated 3.8%; stage IB 13.3%/IIB, 39.6%/IIIA 11.4%/IIIB 30%/IVA 5.7%. Main toxicity (grade 3 or greater): neutropenia 1 (1.8%), mucositis 4 (7.5%), febrile neutropenia 2 (3.7%), hyperemesis 1 (1.8%). All patients completed Radiotherapy. 35 patients were evaluable for tumor response: Complete response 82.8%/partial response 17.2%. Histopathology was predictive factor for the responses found in univariate analysis. The median overall survival has no not reached.

Conclusions: This retrospective analysis suggest that systemic chemotherapy followed by radio or concomitant radiochemotherapy with platinum in neoadjuvant scheme was well tolerated and is a feasible option for locally advanced cervical cancer in efficacy terms. Better outcomes were observed in patients with adenocarcinoma and completed response.

UNCOMMON CASE OF VAGINAL CANCER IN A YOUNG PATIENT

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Introduction: The vagina cancer represents 2% of the gynecological malignancies. The risk increases with age. Tumor stage is the most important prognostic factor. Tumor size, age (>60 year-old) and location outside the upper third and advanced age (>60 year-old) are adverse risk factors. Women who were exposed to diethylstilbestrol in utero have a high risk of developing adenocarcinoma of the vagina. HPV is presented in 60-80% of squamous cell carcinoma.

Case report: A 38 year-old woman diagnosed with epidermoid carcinoma of anterior upper third the vagina. MRI and PET/CT confirm the lesion without perivaginal tissues invasion and a left internal iliac lymph node, not showed distant metastases. EBRT was delivered to the pelvis, inguinal lymph nodes and entire vagina with 50 Gy in 25 fractions. Additional boost was delivered to the pelvic lymphadenopathy with 10 Gy in 4 fractions. The residual tumor was treated with interstitial brachytherapy in 2 fractions of 8.5 Gy and 10 Gy, respectively. The complete response to treatment persists after 23 months of follow-up.

Discussion: Given the low incidence of vaginal cancer, there is not strong evidence for the optimal management of this disease. Guidelines extrapolate clinical experience in cervical cancer. The standard treatment is definitive radiotherapy (EBRT, brachytherapy or combination of both) RT obtained 5-year overall survival rates from 35% to 78%. Total dose higher than 70 Gy is recommended. Surgery has a role only in selected cases. Chemotherapy is under evaluation, neoadyuvant surgery or concomitant with radiotherapy.

VMAT VAGINAL RESCUE AFTER RADIOTHERAPY AND BRACHYTHERAPY IN ENDOMETRIAL CANCER

Vásquez Rivas, W.A.; Luna Tirado, J.; Penedo Cobos, J.M.; Marín Arango, J.P.; Prieto Muñoz, I.; Olivera Vegas, J.; Vara Santos, J.; Pérez Casas, A.M.; Esteban Moreno, D.; García Castejon, M.A.

Objectives: To show the possibility of rescue VMAT with curative intent in vaginal recurrence of uterine cancer previously treated with radiotherapy and brachytherapy.

Material and methods: 74 year old woman. Diagnosis of endometrial endometrioid adenocarcinoma, affecting uterine corpus and cervical extension. Myometrium Infiltration >50%. Free surgical margins. pT2. Pelvic lymphadenectomy 0/12. Para-aortic lymph 0/19. Adjuvant radiotherapy (pelvis, 45 Gy) and brachytherapy (Colpotomy, 4×4 Gy). At 26 months follow up: Recurrence at the level of the lateral vaginal wall in the middle-lower third, viewable in Physical exam and MRI. PET-CT: nodule of 2 cm in left vaginal wall (SUV 12.0). Biopsy: adenocarcinoma. Given the impossibility of surgical salvage, rescue was performed using VMAT: PTV1 (Middle and lower vaginal third), dose 40 Gy (2 Gy/f), PT2 (Vaginal nodule), 60 Gy (2 Gy/f), IGRT (daily Cone-Beam) was performed, treatment was performed by placing a daily intravaginal cylinder, diameter and length tailored to the patient with intention of providing fixation of the tumor area, better visualization in Cone-Beam and greater assurance of treatment reproducibility.

Results: 4 months after treatment the patient have achieved a complete remission on physical examination and on evaluation MRI. No adverse effects have been registered.

Conclusions: Re-irradiation using VMAT with an accurate vaginal fixation that guarantee the reproducibility of the treatment, can be a safe and effective technique in the treatment of vaginal recurrence of endometrial cancer in selected patients, fulfilling the dosimetric constraints to organs at risk.

CHILDHOOD CANCER

ANESTHESIA FOR PEDIATRIC EXTERNAL BEAM RADIATION THERAPY: INSTITUTIONAL EXPERIENCE

Valero Albarrán, J.; Potdevin, G.; Román, J.; Lopéz Ibor, S.; Villa, M.; Payano, X.; Chen, X.; Rubio, C.

Purpose: To describe and evaluated the use of anesthesia in pediatrics patients treatment with external beam radiotherapy (EBRT).

Methods and materials: Between January 2008 from April 2014, 53 patients under 20 years received EBRT. 25% required anesthesia during treatment. A median was age of 4 years. Patients were classified by age and diagnostic. All patients received concomitant chemotherapy. Patients self-monitoring with electrocardiogram, O_2 saturation, capnography and arterial blood gas analyzed, and all had access to central venous access with port-a-cath. The complications related to anesthesia were described.

Results: The distribution of patients by subgroups was: under 1 year (8%) 1-2 years (8%), 2-3 years (15%), 3-4 years (38%), 5-6 years (31%) and diagnosis primary CNS tumors (54%), neuroblastoma (15%), rhabdomyosarcoma (15%), Wilms tumor (8%) and Ewing's sarcoma (8%). A total of 430 procedures under anesthesia (96% of treatments and simulation 4%) were made. Mean number of sessions per patient was 28 (5-30). Anesthesia technique in 95% of patients included propofol induction and maintenance with spontaneous ventilation or sevoflorane. All treatments were performed with an overall time of 45 minutes (20-60 min) with an early recovery. No patient had no complications resulted from the anesthetic process.

Conclusions: According to data reported in the literature, the anesthetic management of pediatric oncology patients is feasible and necessary for appropriate administration of radiotherapy, mainly in children under 4 years. Given our experience described can consider it a safe procedure for these patients.

HELICAL TOMOTHERAPY IN PEDIATRIC ONCOLOGY: TEN YEARS EXPERIENCE

Matute, R.; Velázquez, A.; Marrone, I.; Villamil, S.; Azinovic, I.

Introduction and objective: Since opening of our Radiation Department, we pretended to incorporate technical advantages of helical tomotherapy as part of radiotherapy treatment in paediatric tumors. The aim of this study is to report our ten year experience.

Material and methods: Retrospectively, medical records from all paediatric patients treated in our department were analyzed. Several tumor sites, histologies and demographic aspects are described. We also report most relevant toxicities and methodological issues.

Results: One hundred and fifty five patients received treatment with helical tomotherapy across 2006-2015. Mean age was 5.7 years (range: 1-16). Most frequent localization was CNS (58%).The three main histologies are medulloblastoma (21%), ependymoma and rhabdomyosarcoma (10.5% each one). 57 patients underwent craniospinal irradiation. Sedation as part of preparation was mandatory in 66% (101 patients) with any case of adverse event related. Fusion with MRI for planning purpose was performed in 44% of cases. Gastrointestinal (44 patients) and haematological (grade 2 in 26%, grade 3 in 14% and grade 4 in 22%) were the most relevant toxicities, specially in large treatment volumes and/or concomitant or previous chemotherapy administration.

Conclusions: Helical tomotherapy is a feasible technique as radiotherapy treatment in paediatric patients. We encourage longer follow-up in homogenous groups to explore and evaluate objective advantages.

MODERN RADIATION THERAPY INMPROVES SURVIVAL IN PEDIATRIC EWING SARCOMA

Granados Prieto, V.; Márquez Vega, C.; Cabrera, P.; Ramírez Villar, G.; Fernández-Teijeiro Alvárez, A.; Ortiz, M.J.; López Guerra, J.L.

Aims and objectives: The Ewing Sarcoma (ES) is a highly malignant neoplasm, whose treatment is complex, interdisciplinary and multimodal. The aim of the study is to analyze prognostics factor for survival in pediatric patients with ES.

Material and methods: Retrospective study of pediatric patients with ES treated during 1979-2014. SPSS 19.0 was used for statistical analysis, Kaplan-Meier ´s method for survival analysis and Cox´model for proportional hazards analysis.

Results: 102 patients were included. Male patients were 55.8% and the median age was 10.5 years. Non axial location predominated (62.8%) and mostly were localized disease (83.3%). The 2 and 5 years overall survival (OS) rate was 81% and 57%, respectively.; 50 patients received radiation therapy (RT) (49%) with radical intention, before or after surgery and three palliative RT. A linear accelerator was used in 43 patients and cobalt units in 10 cases. Additionally, 2 dimensional (2D) planning was used in 23 patients and 3D in 30. Local recurrence occurred in 12 patients (11.7%); of these, 4 received RT (3 patients with radical intention and other after surgery). Risk factors for overall survival (OS) in the univariate analysis were: an erythrocyte sedimentation rate at diagnosis > median (Median 43; HR: 4.42, p=0.02), the lack of surgery (HR 1.97, p=0.024), poor pathological responder to induction chemotherapy (HR 2.88, p=0.012), the use of cobalt units (vs. linear accelerators) (HR 2.93, p=0.009) and the response to multidisciplinary treatment (progression versus rest of responses; HR 6.52, p<0.001). In multivariate analysis only the radiotherapy units (HR 4.21, p=0,030) and the response to treatment (response vs progression: HR 0.10, p<0.001) retained statistically significance.

Conclusions: Our results suggest that pediatric patients with ES who have a good response to multidisciplinary treatment or those treated with linear accelerators vs cobalt units have a lower risk of mortality.

NO CLINICAL PNEUMONITIS IN TOMOTHERAPY PEDIATRIC NEUROAXIS IRRADIATION

Villamil, S.; Matute, R.; Velazquez, A.; Azinovic, I.

Introduction: Tumors of the nervous system are the most common solid tumors in children with a combined overall survival of 60% at 5 years. Craneospinal irradiation plays an important role in the management of some cases. Tomotherapy provides ease and reliability over conventional techniques in this type of treatment. However the increased volume of tissue receiving low dose of radiation can cause potential toxicity. The aim of our study was to assess the rate of clinical pneumonitis recorded tomotherapy pediatric neuroaxis irradiation.

Material and methods: A retrospective analysis of patients treated between 2006-2014, found in our database 57 children with a mean age of 5.8 years (2-14 years) treated. The dose was administered in the medullary canal of 23.4-25.2 Gy in 64.9% and 36-39 Gy in 35% with fractionation of 1.5 to 1.8 Gy/fx. We analyze the dosimetric data related to low doses of irradiation on lung volume received in these patients.

Results: With a median follow-up of 15 months, there has been no case of pneumonitis clinically significant in either dose groups. The lack of images of the chest in the majority of patients prevents proper evaluation of pneumonitis rate of grade 1. The average dose to the lungs was 5.8 Gy (1.94-10.20 Gy) Lung V5: 53,9; V7: 37,4; V10: 19,5.

Conclusions: Despite the relatively high lung volume receiving doses of 5-7 Gy, any case of clinical pneumonitis was recorded. Increased monitoring of these patients could generate clinical data to identify new dosimetric lung constraints.

TREATMENT OF CHILDREN WITH GLIOBLASTOMA MULTIFORME WITH RADIOTERAPHY: CASES REPORT

Romero, A.; Escribano, A.; Castaño, A.; Colmenar, A; Glaria, L.; Reyes, J; Mírales, L.; Mañas, A.

Introduction: The treatment of brain tumors in children with radiotherapy is one of the; most important challenges in radiation oncology. his requires; administration of a homogeneous dose to tumor volume, so that the; neighboring healthy tissue receives the lowest dose.; his concept is especially important in pediatric oncology by the cognitive; decline that occurs with radiation therapy.; Glioblastoma multiforme (GBM) is the most aggressive form of primary; malignant brain tumor, represents approximately 5% to 10% of pediatric; brain tumor.

Materials and methods: Here two cases of pediatric patients, 8 and 10 years old presented with GB; located in the brainstem and right temporal lobe, respectively. Children underwent surgery. Radiotherapy treatment was administered 42 days after surgery. Planning C was performed with thermoplastic immobilization mask and; vacuum mattress. One patient required daily anesthesia before each session of radiotherapy.; he treatment volume included the macroscopic tumor according to the; planning C with a margin of 1.3 to 1.5 cm he total dose was 54 Gy to the tumor located in the brainstem and 59.4 Gy; to the tumor of the right temporal lobe with fractionation of 1.8 Gy/d, with VMA (2 arcs) with energy of 6 MV; he response at 6 weeks of radiation treatment was evaluated with brain; MRI, without evidence of disease.

Conclusion: Glioblastoma multiforme is a rare tumor in children. Its management; requires a multidisciplinary approach and should be treated in specialized; centers with adequate radiotherapy techniques.

VOLUMETRIC MODULATED ARC THERAPY IN HIGH-RISK NEUROBLATOMA´S TREATMENT

Flores Rodríguez, J.D.; Avila Delgado, V.H.; Mateos, J.C.; Campos Triviño, B.M.; Ortiz Gordillo, M.J.; Cabrera Roldan, P.

Objectives and purpose: Descriptive analysis of high-risk neuroblastoma´s treated with volumetric modulated arc therapy (VMAT), including until 21 Gy, fractionated in fourteen sessions, 1.5 Gy each, based in "HR-NBL-1.5/SIOPEN" guidelines.

Material and methods: Between 2011 and 2014 nineteen kids were treated with VMAT. Seventeen (89.4%) of them over the surgical wound and two (10.5%) because local recurrence (initially treated with 3D radiotherapy). There were 13 boys and 6 girls, with an medium age of 38 months (range 6-72 months). According to "Internacional Neuroblastoma Staging System", 10.5% were stage 3, 84.2% stage 4 and 5.2% stage 4S. About the location of the primary tumor, the first place was on the single adrenal gland in 68.4%, abdominal in 15.7% of the cases, 5,2% thoracoabdominal, 5.2% cervical and 5.2% bilateral adrenal gland. N-myc amplification was positive in 31.5% of the cases.

Results: After median follow-up of 1.2 years (range 0-10 years), we found that the 42.1% of the patients were alive without tumor, 10.5% alive but with metastatic disease, 31.5% have died because the tumor and 15.7% have died because an intercurrent cause. The radiotherapy tolerance was acceptable: 21% showed acute gastrointestinal toxicity grade 1-2, and 5.2% showed chronic bone toxicity grade 2.

Conclusions: In our patients, VMAT technique has demonstrated local control and minimum toxicity, providing higher security and dosage conformation in recurrent cases. It is very important the long follow-up of these patients to evaluate second neoplasms incidence, local-regional control and increase survival.

WILMS TUMOUR TREATED WITH RADIOTHERAPY. SINGLE CENTER EXPERIENCE

Flores Rodríguez, J.D.; Ávila Delgado, V.H.; Mateos, J.C.; De Haro Piedra, R.; Ortíz Gordillo, M.J.; Cabrera Roldán, P.

Purpose and objective: Descriptive analysis of Wilms tumour (WT) treated with radiotherapy (RT) during 2004-2014 in our hospital.

Materials and methods: Our population includes ten girls and six boys diagnosed with WT, with a medium age of 3.5 years (range 0-12). About localization, 50% had left kidney involvement, 37% right kidney involvement and 13% bilateral kidney affectation. According to NWTS clasification we found 6.25% in stage II, 56.25% stage III, 25% stage IV, and 12.5% stage V; 81.25% of total patients had favorable histology findings. According "Nephroblastoma SIOP 2001", all patients were initially treated with surgery and chemoterapy scheme. After that fourteen initiated radiotherapy over surgical area, one tumour relapse, and one liver metastasis. Two last patients did not require radiotherapy on the onset because their low-risk. The dose was 14-15 Gy with favorable histology findings, and until 21 Gy with unfavorable.

Results: Seven patients were treated with RT3D, one with Intensity Modulated Radiation Therapy, and eight with Volumetric Modulated Arc Therapy.; The radiotherapy tolerance was acceptable: 12.5% presented acute gastrointestinal toxicity grade 1-2 related to treatment; chronicle kidney toxicity has been noted in 2 patients.; After medium follow-up of 3.8 years (range 0-7.5) 100% are alive without tumor.

Conclusions: The acute toxicity related with radiotherapy has been acceptable, being the chronicle toxicity associated with the overadministration of 10 Gy. The overall survival has been very favorable, noting all the patients are alive without tumor. The long follow-up of these patients to evaluate second neoplasms incidence, local-regional control and increase survival.

TRANSLATIONAL RESEARCH

A SIMPLE OPTICAL METHOD TO EVALUATE PATIENT EXTERNAL MOTION

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Objective: To devise a method to detect and measure positions of a number of points; and to develop a tool to detect patient motion during radiotherapy treatments, alert of out of tolerances motion, and record the trajectories for subsequent studies.

Methods: The system obtains the 3D position of points in space, through its projections in 2D images recorded by two cameras. It tracks black dots on a white sticker, placed on the surface of the moving object. The system was tested with several moving phantoms. It was also used to track 500 trajectories of points on the surface of patients during treatments.

Results: Positioning accuracy is better than 0.3 mm in the three directions of space. The system followed periodic motion with amplitudes lower than 0.5 mm; followed rotating points at speeds up to 11.5 cm; and tracked accurately the motion of a respiratory phantom. It was used to check the motion of patients during radiotherapy, and trajectories were analyzed.

Conclusions: The method is flexible. Its installation and calibration are simple and quick. It is easy to use and can be implemented at a very affordable price. Data collection does not involve any discomfort to the patient, and does not delay the treatment, so the system can be used routinely in all treatments. It has an accuracy similar to that of other commercially available systems, and is much more simple. It is suitable to implement a gating system, or any other application requiring motion detection.

CAN BE PARAOXONASE IN BREAST CANCER A MARKER TO PREDICT PROGNOSIS?

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Purpose and objectives: The main effect of radiotherapy is oxidative damage to the affected cells. Paraoxonase-1 (PON1) is an enzyme that d plays an antioxidant role. This project is aimed to investigate whether serum PON1 activity or concentration could be proposed as molecular markers of the response to radiotherapy treatment.

Materials and methods: We included 77 patients with breast carcinoma considered as candidates of complementary radiotherapy treatment and 77 control patients. Blood samples were obtained at the beginning of radiotherapy and one month later the end of radiotherapy. Serum PON1 concentration, lactonase and esterase activities of PON1 were measured in all patients.

Results: Mean age was 55 years (38-83). 61 patients: conservative surgery and 14: mastectomy. 43 patients: sentinel node biopsy and 32: lymphadenectomy. 64 patients had positive estrogen receptor, 53 had positive progestagen receptor, 39 patients (51%) had Ki67>15%, Her2 positive in 16 patients (21%). The classification of tumor were in 29 patients luminal A, 24 luminal B, 16 Her 2, 7 basal like. 32 patients had tumor size >2 cm. 44 patients had positives nodes. 13 patients: hypofractionated schedule (40.05 Gy, 2.66 Gy/session). Acute toxicity: 27% grade 1, 50% grade 2, and 6.5% grade 3. Follow up: 26 months. 3 patients relapsed locally and 6 developed metastase and one patient died. Lactonase activity significantly increased while the esterase activity decreased significantly. Low levels of lactonase and paroxonase PON1 activities were associated with belonging Her2 positive subgroup.

Conclusion: This preliminary study shows a correlation of PON1 activities with Her2 breast cancer. Further studies with more patients are needed to ascertain if PON1 can be a useful marker to predict the breast cancer prognosis.

HEREDITARY CANCER AND GENETIC COUNSELLING IN RADIATION ONCOLOGY

López Ramírez, E.; Serradilla Gil, A.; Angulo González, A.; Rivas Sánchez, D.; Lazo Prados, A.; Albiñana Durá, E.; Sánchez Carretero, A.; Peel, C.

Introduction: Hereditary cancer represents 10% of all tumours. Hereditary Breast and Ovarian Cancer (HBOC) and Lynch Syndrome are the most representative hereditary cancers. Identifying at risk patients enables personalized treatments, selection of different extension studies and can modify the decision about surgical treatment in patients with breast cancer. Radiation oncologists can acquire the necessary knowledge for a genetic counselling consultation.

Materials and methods: During 3 months, 137 patients were referred to our Radiation Oncology Departments. We evaluated all of them with the Hereditary Cancer Quiz Myriad Genetics Spanish version to determine suitable candidates for genetic counselling. The mean age was 60.86 years (25-89). 57% were female. Tumour distribution was: 52 breast (37.95%), 14 colorectal (10.22%), 29 prostate (21.17%), 8 lung (5.84%), 5 endometrial (3.6%), 1 melanoma (0.7%), 1 stomach (0.7%) and 2 rare tumours (1.46%). Identifying criteria was a personal and family history of: Multiple related tumours, early age at diagnosis (80% of them would meet NCCN guidelines for genetic testing.

Results: 44.5% (61/137) of the patients met family history criteria for hereditary cancer counselling. Of those 70% (43/61)

were related with HBOC and 26% (16/61) with Lynch Syndrome. 31.4% (43/137) had family histories of cancer at an early age (<50 years). 54.1% (33/61) of patients with a family history of cancer had 2 or more risk criteria. 30.6% (42/137) of patients were diagnosed with <50 years, of which 30 patients were <40 years. 1 patient had multiple tumours, 3 patients had rare tumours, 2 patients were triple negative and <60 years old. 97% of patients, in our series, with an indication for genetic counselling had not been referred or evaluated by a genetic counsellor.

Conclusion: These data support the introduction of screening for hereditary cancer as it provides quality to the oncology practice and meets an unresolved social need. Knowledge and training in this area would improve the services offered by Spanish Radiation Oncologists.

IMMUNOSTIMULATORY-MONOCLONAL-ANTIBODIES AND RADIOTHERAPY: SYNERGY AND INHIBITION OF DISTANT UNTREATED-TUMORS (ABSCOPAL-EFFECT)

Rodriguez-Ruiz, M.E.; Rodríguez López, I.; Garasa, S.; Barbes, B.; Martinez-Monge, R.; Melero Bermejo, I.; Valtueña, G.; Melero Bermejo, I.

Purpose: Radiotherapy (RT) has effects on immune response that can be exploited to treat the already spread disease. RT can cause immunogenic tumor cell death resulting in cross-priming of tumor-specific T-cells, acting as an in situ tumor vaccine; however, RT alone rarely induces effective anti-tumor immunity resulting in systemic tumor rejection. We therefore tested the hypothesis that Immunotherapy can complement RT to help overcome tumor-induced immune suppression, and derepress/artificially enhance the immune response induced as much as to prevent the progression of distant tumors (abscopal-effect).

Methods and materials: Mice bearing a colon carcinoma (MC38) in both flanks were treated with immunotherapy and radiotherapy. Mice were randomly assigned to 8-groups receiving or not radiotherapy (8 Gyx3 fractions), to only 1 of the 2 tumors, in combination or not with immunostimulatory-monoclonal-antibodies (anti-PD-1, anti-CD137 or both). Mice were followed for tumor growth/regression. Similar experiments were conducted in mouse melanoma model (B16).

Results: RT alone led to growth delay exclusively of the irradiated MC38 and B16 tumor, as expected. Surprisingly, growth of the non irradiated tumor was also impaired by the combination of RT and anti-PD1anti-CD137. We have observed that: 1) irradiation increases the inflammatory infiltrates in mouse tumors. 2) both CD8 and CD4 Tcells readily express the targets for the antibodies. 3) radiation may act synergistically with immunotherapy to enhance immune responses, inhibit immunosuppression, and/or modified the phenotype of tumor cells, thus rendering them more susceptible to immune-mediated killing.

Conclusions: These results demonstrate that the abscopal-effect is in part immune mediated and that Tcells are required to mediate distant tumor inhibition induced by radiation. Future directions may combine multiple approaches to immunotherapy that increase the effect of RT on anti-tumor T-cell priming as well as contribute to other steps of immune rejection.

MOLECULAR PROGNOSTIC MARKERS IN CERVIX CARCINOMA TREATED WITH RADICAL RADIOTHERAPY

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Objectives: To determine molecular predictive markers in cervical carcinoma.

Methods and materials: We treated 67 patients (p.) with histological diagnosis of cervical carcinoma with external radiotherapy and endocavitary brachytherapy, Mean age: 64 y; histology: epidermoid (60), adenocarcinoma (7); stages: II-IVa. Immunochemistry was carried out in pretreatment paraffin-embedded biopsies for; semiquantitative determination of p53, Ki67, p16-INK4, COX2, epidermal growth; factor receptor (EGFR). Also, we evaluated vascular CD31 to determine microvessels density (MVD) as surrogate marker of tumour hypoxia. Statistic: Kaplan-Meier,long-rank.

Results: Five-years overall, disease-free and pelvic relapse-free survivals were; 52%, 48% and 56%, respectively. Clinical prognostic factors for pelvic control were: Hb1.2 (p=0.04), hidronephrosis (p=0.01), tumor size >4 cm (p=0.02) and adenocarcinoma histology (p=0.02). Molecular prognostic factors were p53+ (39% vs 50%, p=0.03), p16-INK4 >10% (0% vs 60%, p=0.0004) and COX2>50% (38% vs 64%, NS trend p=0.06). Adenocarcinoma histology was associated with COX2 expression (p=0.02) and p-16 negativity (p=0.005). MVD was not related with Hb levels (pearson=0.02) and did not influence prognosis. Patients with molecular profile consisting of p53+ or p16- or COX2+ had a worse prognosis as compared with patients with p53- and p16+ and COX2- (5-y survival: 19% vs 66%, p=0.001; 5-y local control: 28% vs 78%, p<0.0001).

Conclusions: The molecular profile consisting of p53+ or p16- or COX2 + is associated with poor survival and local control and could be of clinical utility. The poor prognosis of adenocarcinoma could be explained by a distinct molecular pattern. MVD was unrelated wit Hb levels and outcome.

RADIOCHEMOTHERAPY RECTAL CANCER: OBESITY AND NUCLEAR-BETACATENIN-EXPRESSION ARE FAVOURABLE PROGNOSTIC FACTORS

Roman, A.; Queipo, M.; Delgado, M.M.; Perez-Villa, L.; De Luque, V.; Otero, A.; Torres, E.; Bayo, E.; Medina, J.A.; Gomez-Millan, J.

Objective: We examined the independent prognostic value of obesity and nuclear ß-catenin in patients with locally advanced rectal cancer.

Methods: We recruited a total of 93 eligible patients with locally advanced cancer for preoperative radiochemotherapy followed by total mesorectal excision. The inmunohistochemical expression of nuclear ß-catenin was analized. The associations stated above were examined using Cox proportional hazard models. Disease-free survival (DFS) was analysed using the Kaplan-Meier method and a Cox regression model was employed for the multivariate analysis.

Results: Obese patients were associated with a lower number of recurrences (4% vs 36%, p=0.002) and a higher DFS (100% vs. 56%; HR, 0.8; 95% CI, 0.75-0.94; p=0.005) than normal/overweight patients. Moreover, patients with presence of nuclear ß-catenin had a DFS of 79% compared with 26% in absence of ß-catenin expression (HR 0.44; 95% CI, 0.2-0.99; p=0.04). In the multivariate analysis, body mass index >30, nuclear ß-catenin expression and absence of lymph node metastases showed a significant increase in disease free survival.

Conclusions: Obesity and nuclear ß-catenin were associated with an increase in disease free survival in locally advanced cancer treated with preoperative radiochemotherapy.

RADIOTHERAPY GETS IMPROVED BY A NANOTECHNOLOGY-BASED ENZYME THERAPY

Fernández Fornos, L.; Barberá, V.M.; García-Morales, P.; Sanz, J.; Fuentes, M.; Saceda, M.; Ventero, M.P.; Espósito, D.; Dorado Rodriguez, P.; García Miragall, E.

Purpose: Our principal aim is to increase radiotherapy effects in chemo-radiotherapy resistant tumors, specially glioblastomas and exocrine pancreatic carcinomas using as potentiator agent the enzyme D-Aminoacid oxidase (DAO) inmovilized in nanoparticles of different nature.

Material and methods: Primary cultures and stablished cell lines obtained from glioblastoma and exocrine pancreatic carcinomas, are irradiated (7-15 Gy) using a Varian 2100CD linear accelerator. After irradiation cells are incubated in the absence or in the presence of DAO (free or inmovilized in nanoparticles) and D-alanine (enzyme substrate). After 24-48 h after irradiation cells are harvested and cell cycle distribution is determined by flow citometry.

Results: We have demonstrated in primary cultures obtained from glioblastomas, that the treatment with DAO after irradiation, potentiates dramatically the effect of the radiation alone, increasing especially the percentage of cells in the sub-G1 phase, an indicator of cell death. Some representative results are included in the attached file. DAO inmovilized in magnetic nanoparticles is more effective than free enzyme, since DAO is more stable at 37ºC inmovilized in nanoparticles.

Conclusions: Our results suggest that radiotherapy effects could be improved by the addition of a nanotechnology-based enzyme therapy with DAO. The potentiation effect is probably due to the increase in free radicals produced by both, the radiation and the DAO activity.

TGFB1 RS8179181 SNP ASSOCIATES WITH LOCOREGIONAL CONTROL IN LUNG CANCER

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Purpose: We investigated prospectively the association between single nucleotide polymorphisms (SNPs) in the transforming growth factor (TGFB1) and heat shock protein (HSPB1) genes and the risk of locoregional relapse (LRR) in patients with lung cancer (LC).

Materials and methods: The data set consist of 136 consecutive LC patients and diagnosis from January 2013 to August 2014. Median age was 63 years-old. The most common histology for non-small cell LC patients (79%) was squamous cell carcinoma (51%). Seventy three percent of patients had Stage III disease and 94% received platinum-based chemotherapy. Median radiation dose was 66 Gy. Sixteen cases also underwent surgery. We genotyped 4 SNPs of the TGFB1 gene (rs4803455, rs1800468, rs8179181, and rs8110090) and 3 SNPs of the HSPB1 gene (rs2868370, rs2868371, and rs7459185).

Results: In univariate analysis, only the CC genotype (N=17; 8 relapses [47%]) of TGFB1 rs8179181 was associated with a statistically significantly higher risk of LRR (HR: 5.15; p=0.023) compared with the CT genotype (N=119;31 relapses [26%]). This effect was virtually unchanged in the multivariate analysis (HR: 2.43; 95% CI, 1.04-5.69; p=0.040). We also evaluated this SNP in a homogeneous group of patients with primary non-small cell LC, without surgery and receiving doses ≥60 Gy (N=64) and similar results were observed in the multivariate analysis (HR: 3.27; p=0.033).

Conclusion: Our results showed that the CC genotype of TGFB1 rs8179181 gene was associated with a higher risk of LRR in patients with LC treated with radio (chemo)therapy and thus may be used for guiding therapy intensity.

TGFB RECEPTOR INHIBITOR RADIOSENSITIZES GLIOBLASTOMA TARGETING CD44HIGH/ID1+ GLIOMA INITIATING CELLS

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Objectives: The main goal of this project is to study the effect of radiotherapy on patient-derived Glioma Initiating Cells (GICs) and assess the combination of radiotherapy and anti-TGF ß therapies to target GICs.

Material and methods: Fresh glioma samples are obtained soon after resection and GICs are isolated and cultured. GICs generate tumors similar to the patient when inoculated orthotopically in the brain of mice. Patient-derived cells and tumors are irradiated and/or treated with a specific TGFß-Receptor I inhibitor. Markers of GICs and tumor growth are assessed by cytometry and MRI.

Results: The irradiation of patient-derived cells results in an increase in CD44high/ID1+ GICs subpopulation both in vitro and in vivo. The increase in the GICs subpopulation is prevented by the treatment with the TGFßRI inhibitor which decreases the percentage of CD44high subpopulation. We have analyzed the viability of cells after irradiation and in combination with the TGFßRI inhibitor and found that the TGFßRI inhibitor can radiosensitize patient-derived cells. We have validated our results in an in vivo mouse xenograft model.

Conclusions: CD44high GICs are radioresistant and the irradiation of patient-derived cells or mouse xenograft tumors promote an enrichment of the CD44high/ID1+ population. Blockage of the TGF ß causes a decrease in the CD44high population of GICs and make the tumor more sensitive to radiotherapy. As GICs are responsible for tumor relapse, the concomitant treatment with radiotherapy and TGFß-Receptor I inhibitor could prevent tumor recurrence in GBM patients.

THE REQUITE PROJECT: VALIDATING PREDICTIVE MODELS AND BIOMARKERS OF RADIOTHERAPY TOXICITY TO REDUCE SIDE-EFFECTS AND IMPROVE QUALITY-OF-LIFE IN CANCER SURVIVORS

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Aim and purpouse: The REQUITE is a collaborative project funded by the European Union. The objectives are: 1) Carry out a prospective multi-centre cohort study in eight countries to collect standardized data on patient characteristics, treatment, radiation side-effects and quality of life; 2) Produce a centralised database and a biobank of DNA for 5,300 patients (breast, prostate, lung cancer); 3) Validate published biomarkers of radiosensitivity; 4) Validate clinical predictors of radiotherapy toxicity; 5) Design interventional trials to reduce long-term side-effects; 6) Provide a resource for dissemination and exploitation to the community.

Material and methods: A centralised database for electronic data capture and storage was developed. Radiotherapy toxicity will be evaluated using CTCAE v4.0 criteria. Quality of life data will be comprehensively assessed before and at end of radiotherapy, as well as 1 and 2 years after start of radiotherapy. All

5,300 samples will be genotyped for SNPs with evidence for association with radiotherapy toxicity. 1,800 samples will be assayed for radiation-induced lymphocyte apoptosis using FACS analysis.

Results: Recruitment started in May 2014. Accrual period will be 24 months with 2 years of follow-up. The project will be completed in September 2018. In Spain, 290 prostate and 100 lung cancer patients will be recruited in one Hospital and 180 breast cancer patients in other Hospital. At February 2015, 165 patients have been recruited (52 breast; 98 prostate; 15 lung).

Conclusions: The results of REQUITE will allow to develop validated clinical models incorporating biomarkers to identify patients at risk of side-effects and to design interventional trials aimed improving the quality-of-life of cancer survivors.

BENIGN LESIONS

A CASE OF POEMS SYNDROME AND RADIOTHERAPY

Fernández Díaz-Fierros, C.; Begara de la Fuente, J.; Moreno Ceano, P.; Jiménez Salas, R.; Góngora Ariza, F.; Velasco Roman, J.; Lopez Moreno, M.D.; Montenegro Montiel, N.; Martín Guarde, L.; Salcedo, G.

Introduction: Polyneuropathy, organomegaly, endocrinopathy, monoclonal gammopathy, and skin changes (POEMS syndrome) is a rare multisystemic disease that occurs in the setting of a plama cell dyscrasia. Based on experience with solitary bone palsmacytomas, the approach for POEMS patients is through the use of targeted irradiation with similar doses and fractionation than plasmacytomas in cases of POEMS with loalized lesions.

Objetive: 51 year female patient. Monoclonal poly-neuropathy IgGlambda, 5% of plama cells in bone marrow biopsy and skin lesions. Subsequent POEMS diagnosis. Progression after chemotherapy and autologous transplant. Dorsal spine MRI with 12 cm intradural-extraspinal lesion from D6 to D10 wich caused spinal cord compression. She presented difficulty in walking, pins and needles sensation, dizziness and electrical shock type pain in her back wich irradiated to members.

Materials and methods: Consent form for risk of acute and chronic myelitis was signed. CT scan and MRI images were fused to define GTV. PTV was irradiated with IMRT and VMAT using 2 arcs of 60º dynamic shaped with 70 segments. Calculation in Monaco, MonteCarlo algorithm. Daily cross checking was performed by fusing the simulation CT scan with the integrated CT (IGRT) and corrected by a Hexapod robotic table. 50.4 Gy was administered in fractions of 1.8 Gy/day (2013).

Results: Complete clinical improvement was seen in one month. She could walk without difficulty. Back pain disappeared.

Conclusion: Radiation therapy as primary treatment for lesions in POEMS patients is effective in more than 50% as well as for patients with no response to chemotherapy and/or transplant.

CAROTID-CAVERNOUS FISTULA TREATED WITH RADIOSURGERY (RC)

Barrado Los Arcos, M.; Errasti Viader, M.; Campo Vargas, M.; Visus Fernandez de Manzanos, I.; Arias De la Vega, F.; Manterola Burgaleta, A.; Martínez López, E.

Objectives and purposes: Assess the benefit and response to treatment of carotid-cavernous fistulas with radiosurgery.

Material and methods: We present the case of a 74 year´s old woman with no significant medical history who begins with suggestive symptoms of migraine and peripheral vertigo. She was appraised/evaluated by the neurological and otolaryngology Services who conducted the necessary studies, including magnetic resonance and resonance angiography objectifying a dural arteriovenous fistula left carotid -cavernous type. She started then a conservative treatment though finally was treated with radiosurgery (15 Gy in a single fraction) with clinical improvement.

Results: Fifteen days later symptomatic and radiological gradual improvement was reached until complete resolution within a period of less than three months.

Conclusion: Radiosurgery in symptomatic and well selected carotid-cavernous fistulas is safe and effective, with complete obliteration rates high, 50-100%.

CONCURRENT DOCETAXEL AND INTENSITY-MODULATED RADIATION FOR NUT-MIDLINE CARCINOMA: CASE REPORT

Marcos, F.J.; García Saenz, J.A.; Bueno, C.; Del Cerro, E.; Couñago, F.; Díaz, A.A.; Rjo, F.; Pardo, E.

Introduction: NUT (Nuclear protein in testis) midline carcinoma is an extremely aggressive and poorly differentiated carcinoma that is genetically defined by rearrangement of the NUT gen on chromosome 15 with members of the BRD gen family. Recently it has been recognized as a distinct clinical entity, occurring in the midline location of the neck, head or mediastinum. Incidence has not yet been well defined but it´s considered a rare disease. Originally described in young patients. Diagnosis has been determined by karyotype analysis or cytodiagnosis of the expression of a NUT-fusion protein by immunohistochemistry and confirmation by FISH (fluorescence in situ hybridization). Differential diagnosis includes carcinomas and poorly differentiated squamous cell carcinomas, olfactory esthesioneuroblastoma, pediatric tumors like rhabdomyosarcoma, and others particularly sinonasal undifferentiated carcinomas. Treatment options have not been well established. Preliminar outcomes are extremely poor.

Methods and materials: The present case was of a massive tumor of the mediastinum (dimensions 50×67×99 mm) N+ in a 49-year-old woman. The patient was scanned with ^{18}F-FDG PET/CT for staging before chemoradiotherapy, 4 cycles of Docetaxel combining intensity-modulated radiation, 50.4 Gy in 28 fractions.

Results: Tolerance was acceptable, there was no grade 3-4 toxicity. Evaluation ^{18}F-FDG PET/CT was demonstrated partial response for the tumor in the mediastinum and complete response for prevascular nodes. Nevertheless, isolated progression in supraclavicular lymph node was observed and treated with salvage SBRT (Stereotactic Body Radiation Therapy), 30 Gy in 5 fractions.

Conclusions: Intensity-Modulated Radiation where available, combining docetaxel-based chemotherapy, may be a choice in the treatment for these patients.

DESMOID TUMORS: OUR EXPERIENCE OF NINE CASES

De la Pinta Alonso, C.; Hernánz De Lucas, R.; Montero Luis, A.; Muñóz Migueláñez, M.T.; Martínez Ollero, J.; Polo Rubio, J.A.; Ramos Aguerri, A.

Background and purpose: Desmoid tumors (aggressive fibromatosis) are rare neoplasms that show local aggressiveness but no propensity to distant metastases. We describe our experience in the treatment of this entity.

Patients and methods: Between January 2000-December 2014, 9 patients with desmoids tumors were treated in our institution. All of them were operated by the same orthopaedic surgeons.

Results: The median age was 40 years (range, 16-65 years). Gender male 5, female 4. One patient cervical location, two patients abdominal and six patients in extremities. All patients

underwent extirpative surgery and 6 received adjuvant radiation therapy. In 5 patients of them the treatment was delivered in two phases, intraoperative electron radiotherapy (IOeRT) followed by external beam radiation therapy (EBRT). IOeRT median dose was 15 Gy (range 14-18 Gy). EBRT median dose after IOeRT was 54 Gy (range 44-66 Gy).One patient was received EBRT as sole treatment (64 Gy). 3 patients had local recurrence; these patients only had been treated with surgery. Finally received radiation therapy with IOeRT and EBRT in two patients and brachytherapy in the other patient. One patient of this died because tumor. Median follow-up was 26 months (range 1-95 months).

Conclusion: Radiation therapy is a feasible adjuvant treatment in desmoid tumors, achieving good rates of local control and overall survival. This combination is necessary in the first moment to diagnoses. The treatment is well tolerated without high grade toxicity.

DESMOIDS TUMOR IRRADIATION: CASE REPORT

Laria Font, C.; Castaño Zuleta, F.A.; Paredes Rubio, S.; Corral Delgado, S.; Bellosta Ferrer, R.; Valencia Julve, J.

Desmoid tumors are rare fibroblastic neoplasms that originate from musculoaponeurotic and fascial structures throughout the body. Account for 0.03% of all newly diagnosed neoplasms and 3% of all soft tissue neoplasms. It is considered to be a benign neoplasm for its bland cellular appearance, scant mitosis and slow-growing. These tumors don't have the ability to metastasize, but they are locally aggressive, with a high rate of recurrence even after surgical resection. Desmoids can cause severe clinical sequelae, including mortality due to infiltration of nearby organs. Radiotherapy is a treatment for the management of desmoids not amenable to surgical resection. These lesions respond slowly but satisfactorily to radiotherapy. Even radiotherapy alone is able to achieve a high local tumor control. We discuss a 39 years old patient, who was performed a laparotomy in June 2010. Over 100 colonic polyps were found, and an oncologic panproctocolectomy is performed. One year later, a mass was seen in the left iliac fossa. Ultrasound guided biopsy is performed, reporting: aggressive fibromatosis or desmoid tumor. We started treatment with Tamoxifen and Celebrex, we hadn't gotten response after five months of follow up. In February 2012 surgically values, discarding the intervention, so we administer a chemotherapy treatment with anthracyclines, last one in July 2012. A new NMR showed a reduction of the mass but surgery is discarded again. We started radiotherapy treatment (50 Gy in 25 sessions) with a good acute tolerance. Two years later, we don't show any change about tumor size, and our patient is asymptomatic.

FIRST AGGRESSIVE VERTEBRAL HEMANGIOMA TREATMENT WITH KYPHOPLASTY AND INTRAOPERATIVE RADIOTHERAPY

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Objective: Kypho-IORT has proven its efficacy in the treatment of spinal metastasis, in terms of pain control and vertebral stabilization. Benign tumours as aggressive hemangiomas invade the spinal canal and/or paravertebral space and may cause cord compression and neurological symptoms, predominantly to the thoracic spine. To our knowledge, we presented here the first case treated by a combination of IORT and Kyphoplasty (Kypho-IORT).

Material: The case is a 56-years-old male who presented an aggressive type IV vertebral hemangioma: neurologic symtoms and anterior epidural mass with invasion of spinal canal.

Results: After an unsuccessful embolization attempt, the patient was operated through a trans-pedicular access. Intraoperative radiotherapy with an INTRABEAM® device was delivered prior to the vertebroplasty procedure, to a single total dose of 8 Gy prescribe to 1 cm around the tip of the applicator. There was no need to add a more aggressive procedure as a laminectomy. There were no immediate complications after procedure. All neurological symptoms have disappeared, and the patient has recovered completely walking ability, without pain association. Ten months after procedure, the patient remains clinically stable.

Conclusion: Kypho-IORT could be a good approach for treating aggressive vertebral hemangiomas, in order to reduce treatment time and faster improvement of neurological symptoms.

IMMEDIATE POSTOPERATIVE RADIOTHERAPY IN THE TREATMENT OF KELOID SCARS

Vargas Arrabal, M.P; Linares Galiana, I.; Guerrero Tejada, R.; Zurita Herrera, M.; Tovar Martín, M.I.; Expósito Hernández, J.; Del Moral Ávila, R.; Gentil Jiménez, M.A.; Prieto Prieto, C.; Rodríguez Pavón, S.

Purpose: Keloids are skin lesions formed by overgrowth of scar tissue that can be caused by surgical incision, traumatic injury, vaccinations, burns, piercings,... Surgical treatment alone produces recurrences in 50% to 80% of cases. The immediate postoperative radiotherapy gives good results. The aim is to evaluate the results after administration of immediate postoperative radiation therapy in keloid scars in terms of aesthetic outcome and recurrence.

Materials: Between 2008 and 2014, 13 patients were treated with postoperative radiotherapy. The 13 lesions were surgically excised and irradiated. In all cases the diagnosis of histologically confirmed keloid. The most common etiologic factor was placing piercings and the most frequent location the helix of the ear. The time interval between the excision of keloid lesions and the start of radiation was 48 hours (12 patients) to 8 days (1 day). All patients were previously evaluated in collaboration with the surgeon. In all patients, a total dose of 15 Gy was administered in fractionation of 500 cGy/day. In none of the patients came wound dehiscence.

Results: The follow-up was 9-47 months. In 12 lesions completed treatment induced complete remission, while in one lesion was partial remission. During follow a recurrence was observed, defined as appearance of a growing and itchy scar at the site of a previously excised keloid, which occurred in those who had first had a partial remission. Showed recurrence at 3 months of radiotherapy completion.

Conclusion: The purpose of the combined surgical-radiotherapeutic treatment provides good results, favorably affecting wound healing.

LOW-DOSE RADIOTHERAPY IN CONSERVATIVE TREATMENT OF DEGENERATIVE PAINFUL OSTEOARTHRITIS

Candini, D.; Hernanz, R.; Montero, A.; Martínez, J.; Ramos, A.

Objetives: To evaluate retrospectively the efficacy of low-dose radiotherapy in degenerative painful osteoarthritis.

Materials and methods: From January-2006 to December-2014, 112 degenerative osteoarthritis of the knee (56 patients, 89%), shoulder (5 patients, 8%), hip (2 patients, 3%) from 63 distinctive patients underwent low-dose radiotherapy for pain control. Painful status was measured by visual analogue scale (VAS). A median radiotherapy dose of 6 Gy (5-6 Gy) was deliv-

ered in 6 daily fractions of 1 Gy. In those patients with a post-treatment VAS of or above 6, a second course of radiotherapy was proposed.

Results: Analyzed series included 53 women and 10 men, with a median age of 84 years (42-91). The median pre-treatment value of VAS was 8 (3-10). Initial response was evaluated 4 weeks after treatment, with a median VAS=3 (1-8). Thirty-nine painful sites underwent a second course of radiotherapy and median time interval between two treatments of 8 weeks (4-63 weeks). With a median follow-up of 19 months (1-97 months), median VAS at last visit was of 3 (range 0-8). Three patients (4.8%) reported VAS=0, 40 patients (63.4%) VAS=1-3, 18 patients (28.6%) VAS=4-7 and 2 patients (3.2%) VAS=8-10. Daily requirements of analgesics were removed or reduced in 56 patients (88.9%). Patient perception of response to irradiation was considered as "better" by 90.5% of patients. No patients presented acute or late complications attributable to radiation treatment.

Conclusions: Low-dose radiotherapy is an effective alternative for treatment of degenerative painful osteoarthritis.

ORBITAL RADIATION THERAPY FOR GRAVES OPHTHALMOPATHY

Garcia Anaya, M.J.; Zapata Martinez, I.; Otero Romero, A.; Toledo Serrano, M.D.; Ordoñez Marmolejo, R.; Román Jobacho, A.; Correa Generoso, R.; Garcia Rios, I.; Gomez-Millan Barrachina, J.; Medina Carmona, J.A.

Purpose: to evaluate the therapeutic benefit of radiotherapy (RT) in patients with Graves ophthalmopathy resistant to large doses of corticosteroids.

Material and methods: retrospective review of seven patients treated in our department with orbital RT between 2006 y 2014. 6 females and 1 male aged between 37 and 82 years. All patients presented proptosis and ophthalmoplegia, three conjuntival hyperemia, one keratitis and one diplopia. They were treated with photons 6 mV. The prescribed dose was 20 Gy in ten fractions of 2 Gy. The irradiated volume was the retrobulbar region. The doses used were below the tolerance level of organs at risk, maximum dose 10 Gy to the lens and 50 Gy to optic nerve.

Results: Median follow-up 66 months (7-100 months). Most patients had no acute toxicity during treatment, except for one patient with conjunctivitis G1. At the end of treatment patients referred clinical improvement of their symptoms. Two patients who developed cataract, one year after radiotherapy and the other one 5 years after radiotherapy were operated. One patient required bilateral decompressive surgery one year after completion of treatment.

Conclusion: In our experience orbital RT is well tolerated with few adverse effects. Exophthalmos improves with RT, whereas ophthalmoplegia is less responsive to irradiation. A small percentage of patients (28.6%) had chronic toxicity in form of cataracts. In our series the benefit of RT was obtained in 85.7% of patients, since only one patient required bilateral decompressive surgery. Our results are consistent with the literature reviewed.

RADIATION THERAPY FOR BENIGN LYMPHOEPITHELIAL CYSTS OF PAROTID GLANDS IN HIV PATIENTS: A RELIABLE THERAPEUTIC APPROACH

Ordoñez, D.J.; Montero, A.; Hernanz, R.; Martinez, J.; Ramos, A.

Background: Benign lymphoepithelial cysts (BLEC) within parotids glands are a rare manifestation of HIV disease characterized by the presence of bilateral parotid swelling with or without cervical lymphadenopathy. BLEC of the parotid gland is the most common salivary gland pathology in HIV. Although they are neither invasive nor associated with malignant degeneration, BLECs can become large and disfiguring. Treatments for BLEC have included repeated fine-needle aspiration and drainage, surgery or sclerotherapy together with antiretroviral therapy. External beam radiotherapy (EBRT) has been used as a conservative treatment for Benign BLEC in HIV patients, with good long-term cosmetic control.

Case report: A 43-year-old male with medical history of HIV infection diagnosed in 1996 under active retroviral therapy and with undetectable viral load presented to our Department with a previous history of slow growing bilateral painless swelling of parotid glands since 3 years ago. Radiological studies demonstrates numerous cystic lesions of the parotid glands, according to the clinical presentation and the previous history of HIV infection, a diagnoses of Benign Lymphoepithelial Cysts was performed. After a thorough review of the existing evidence in the scientific literature, a treatment by external beam radiotherapy (EBRT) was proposed. Informed consent was obtained after discussing benefits and risks of RT with the patient. Immobilization was performed by means of a head mask ensuring daily position reproducibility. The patient underwent CT-based simulation where both parotids were contoured as clinical target volume (CTV). Planning target volume (PTV) was CTV with 5 mm symmetrical expansion. EBRT delivered was 24 Gy in 1.5 Gy fractions daily for a total 16 fractions. Acute tolerance was excellent. Six months after treatment, the patient showed a consistent bilateral decrease in the size of both parotids keeping the facial symmetry with good aesthetic results but without appearance of late complications.

Conclusion: EBRT is a reliable alternative for the treatment of BLEC of the parotid glands in HIV patients. This approach provides good response rates and sustained long-term cosmetic control with an acceptable toxicity profile.

RADIATION THERAPY WITH ELECTRONS TO PREVENT KELOIDS RELAPSE

Ferrer, C.; Bouche, A.; Conde, A.; Beato, I.; Frances, A.; Morillo, V.; Muelas, R; Sanchez, A.L.; Garcia, Raquel; Albert, M.

Objetives: Postoperative irradiation has been established as the most effective treatment for preventing the re-formation of keloids. We show our experience with external beam radiotherapy with electrons in 18 patients treated in HP. de Castellón.

Material and method: We used the Vancouver Scale to classify the Keloids. In less of 24 h after surgery used electrons of 6 Mv with a schedule of 4 Gyx4 F with bolus 1 cm.

Results: The minumum follow up was 6 months (6-54 m) median 38 m with a control rate from 89%.

Conclusions: Radiation therapy with electrons is an easy, non expansive and efective methods to prevent the Keloids relapse.

RADIOTERAPHY FOR KELOIDS: PRE OR POSTOPERATIVE? DOSE AND FRACTIONATION SCHEME

Molina, J.G.; Lanzuela, M.; Ibañez, R.; Cuartero, E.; Vazquez, C.; Sanagustin, P.; Puertas, M.M.; Mendez, A.; Ponce, J.M.; Tejedor, M.

Purpose: To evaluate and compare outcomes between preoperative and postoperative radiation therapy and different fractionation schedules.

Materials and methods: Between 2011 and 2014, twenty one patients with keloids scar refractory to treatment (19% of these has recurrence after exclusive surgery) were treated with super-

ficial RT with different schemes of treatment. 8 patients were treated with RT preoperative, 8 with postoperative RT and 1 with RT exclusively. We compare the outcomes of RT preoperative (52.38%) and postoperative (42.85%) with an interval between them <6 hours and follow up of 4-34 months.

Results: 17 patients (80%) has a satisfactory outcome of keloid treatment with different RT regimens. 4 patients presented recurrence of keloids after treatment, all of them received a single fraction treatment of 6 Gy (3 with preoperative and 1 with postoperative treatment).

Conclusion: Radiotherapy administered in a period within 6 hour before or after surgery of the keloids has to probe be effective, independent of irradiation scheme (Total dose of 6 Gy, 8 Gy, 9 Gy, 10 Gy, 16.5 Gy y 28 Gy). But we found a slight increase of local recurrence in patients treated with single preoperative dose of 6 Gy.

RADIOTHERAPY FOR HYPERSALIVATION IN AMYOTROPHIC LATERAL SCLEROSIS, A CASE

Ortega Álvarez, C.; Sánchez Sánchez, M; Amr Rey, O.; Martínez Navarro, J.A.; Vázquez Pérez, G.

Purpose: Scintigraphy as useful technique to define the target in the radiotherapy of hypersalivation in patients with amyotrophic lateral sclerosis (ALS).

Methods and materials: A 66 year old male diagnosed bulbar ALS, PEG carrier with uncontrollable drooling after treatment with botulinum toxin for assessment of radiotherapy. Scintigraphy is requested to assess the glandular function with normal uptake in submandibular glands but decreased in both parotid glands. It´s defines as target only the submandibular glands and receive a dose of 24 Gy (300 cGy/session).

Results: The patient had excellent tolerance and improved her drooling from 16 Gy. Their symptoms were decreased in subsequents test.

Conclusion: Scintigraphy can identify most of active salivary glands, define the target with good clinical response avoiding irradiating the rest of glands without or less activity.

RADIOTHERAPY FOR PRIMARY AND RECURRENT LEDDERHOSE DISEASE (LD)

Salinas-Martín, A.A.; Fuentes-Sanchez, C.; Herrera-Navarro, L.; Villamil-Montufar, S.; García-Morales, E.; Martín-Ortega, J.J.; Martinez-Cedrés, J.C.; Espiñeira-Yanes, M.; Hernández-Gonzalez, R.; Armijo-Mallorquín, A.

Objective: Plantar fibromatosis/LD is a rare hyperproliferative non-malignant disorder. In early stages, conservative therapy includes non-pharmacological and pharmacological approach. If the disease progresses, surgery is the first option with discouraging results. This study analises the role of RT in LD.

Method: A retrospective study of a clinical cohort of patients irradiated for LD in the last five years in a RT department. RT was administrated with a 6MeV beam; 30 Gy; 10 fractions. RT field involved all nodules and cords plus 0.5-1 cm.

Results: From November 2011 to February 2015, 20 patients were treated: 8 males and 12 females. Mean age was 49 (30-65 years). Lessions were bilateral in 13 patients (33 feet). All patients had walking difficulties due to pain ("moderate" or "severe") and lesions were 5 cm in average (0.6-6 cm). By the end of RT, pain was controlled in 91%: "not pain" 13/33, "mild" 17/33, "moderate or severe" 3/33 (2 patients with no response). Nodes also improved: disappeared 3/33, decrease 12/33, no change 18/33. Nobody had skin related effects. Two patients with surgery prior RT were in the responders group. No changes were seen 6 months later. Median follow-up was 17 months (2-39 m) and during this period no one needed surgery.

Conclusions: Radiotherapy is effective and safe in treating LD, and it might be a better option before surgery.

VMAT IN THE TREATMENT OF PATIENTS WITH BILATERAL GRAVES' OPHTHALMOPATHY

Carmona-Vigo, R.; San Miguel, I.; Luque, L.; Lloret, M.; Cabrera, R.; Lara, P.C.

Purpose/Objective: Graves'Ophthalmopathy is the commonest extrathryoidal manifestation of Graves'disease. Our purpose is to investigate if retro-orbital irradiation with Inverse VMAT planning produced better target coverage and dose sparing to adjacent normal structures as compared with 3D conformal and Lateral Opposed Conformal Fields (LOCF) for patients with bilateral Graves'Ophthalmopathy.

Material and methods: Fourteen patients were prospectively recruited. An individual Inverse VMAT planning, 3D conformal plan and LOCF was created for each patient. Conformity Index (CI), Homogeneity Index (HI) and other dosimetric parameters of the targets and organs-at-risk (OAR) were compared between the different techniques.

Results: CI generated by Inverse VMAT planning was superior to that produced by 3D conformal and LOCF ($p<.001$ for both respectively). As expected Inverse VMAT was superior to 3D conformal ($p=.007$). However the differences in the HI was not significant. Inverse VMAT planning resulted in better OARs dose sparing (globe, lens, retina, lacrimal gland, optic nerve) with the exception of the optic chiasm that received a higher dose. The differences in the dose sparing of the OARs didn't shown a significant difference when comparing 3D conformal to LOCF.

Conclusions: Inverse VMAT planning is superior to 3D conformal and LOCF for bilateral Graves'Ophthalmopathy treatment in virtue of the benefit on the target coverage, better CI with similar HI, and better sparing of the OARs, despite an increase in treatment planning and delivery time, consumption of monitor units and a slightly increased but clinically negligible dose to some surrounding structures.

VMAT/3D RADIOTHERAPY IN MANAGING PATIENTS WITH THYROID ORBITOPATHY

Iglesias Agüera, A.; Escolar, P.; Gomez, M.; Puchades, V.; Mata, F.; Ramos, D.; Serna, A; Salinas, J.

Objective: To evaluate the differences, 3D versus VMAT radiotherapy in Graves' ophthalmopathy.

Material and methods: We studied a patient who takes planning with 3D and VMAT technique, prescribed 20 Gy in 10 fractions. In the 3D treatment 6 MV photons are used with two parallel opposed fields. PTV was the retroocular region. VMAT treatment at 6 MV photons used in a single arc. Constrains: eyeballs, crystalline, brain.

Results and discussion: results of these techniques were compared. brain median dose to brain: 43.4 cGy 3D/222.5 cGy VMAT. Crystalline median dose: 148.5 cGy 3D/289.2 cGy VMAT. Eyeballs median dose: 1326.9 cGy 3D/1080.2 cGy VMAT. PTV: 96% of the volume- 95% dose (3D); 99.6% of the volume-95% dose (VMAT).

Conclusion: Treatment with radiotherapy in Graves' disease with VMAT allows better conformation, increases the median dose to organs distant but decreases the median dose to adjacent organs.

LYMPHOMAS

ADVANTAGE OF BUTTERFLY-VMAT VERSUS VMAT IN MEDIASTINAL TUMOURS

Luna Tirado, J.; Gómez-Tejedor, S.; Rincón Pérez, M.; Prieto Muñoz, I.; García Castejón, M.; Penedo Cobos, J.M.; Olivera Vegas, J.; Vásquez Rivas, W.; Vara Santos, J.; Pérez Casas, A.M.

Introduction: There is a growing concern about the risks of late adverse effects in young people who receive mediastinal radiotherapy. The amazing technical advance has achieved better planned treatments. At present, the new focus of interest is to minimize the low doses in organs at risks (OARs).

Material and methods: We present three young women, two diagnosed of mediastinal lymphoma (total dose 36 and 30 Gy) and one diagnosed of hemangiopericytoma located at internal mammary chain (total dose 50 Gy). Two treatment plannings were compared: volumetric modulated arc therapy-VMAT- and Butterfly VMAT (a technique developed by the University of Turin, Radiation Oncology Unit). VMAT was performed with a double arc of 360º. B-VMAT consisted of 2 coplanar arcs of 60º (gantry starting angles 150º and 330º) and 1 no-coplanar arc of 60º (gantry starting angles 330º, couch angle 90º).; We registered V95, V98, V107, Medium dose, Homogeneity index (HI) and conformity index (CI) related to PTV. For OARs (heart, lung and breast) and body, several dosimetric parameters were analyzed.

Results: Our results show similar data in PTV coverage, IH and CI. Regarding OARs, dosimetric parameters were equivalent in lung and heart. However, breast doses were clearly lower with B-VMAT, mainly the lowest doses (V4 and V10).

Conclusions: B-VMAT for mediastinal tumours is clearly superior to usual VMAT for breast doses, and equivalent in the rest of dosimetric parameters. Although the inclusion of more patients is needed, our preliminary results show B-VMAT like a great technical advance in mediastinal radiotherapy.

BULKY DISEASE LYMPHOMAS: COULD IT BE TREATED WITHOUT RADIATION THERAPY?

Sierra-Arrieta, I.M.; González-San Segundo, M.C.; Guerrero-Gómez, L.L.; Araque-Cancar, J.C.; Alvarado-Vásquez, E.; Martínez-Arribas, C.M.

Objectives: To study the behavior of lymphomas with "bulky" disease and radiotherapy influence on survival outcomes and local control.

Patients and methods: We analyze 162 patients with Hodgkin disease (HD, 59) and non-Hodgkin lymphoma (NHL, 103) treated between April 1986 and April 2014, with bulky disease according Costwold's criteria. Summarizes retreatment clinical characteristics. 92 p (57%) received combined treatment (CRT) and 70 p (43%) were treated with chemotherapy alone (CT). Radiotherapy was indicated as adjuvant of bulky disease in advanced stages or involved field in stages I and II. Mean dose of radiotherapy was 33.5 Gy [18-40]. The analysis end point was to study the overall survival (OS) and local control in bulky area.

Results: The median follow-up was 69 months. After CT, complete response was achieved in 84 p (52%). This data increase to 76% when RT was performed. Severe toxicity was low (3.5%). 48 p (30%) had recurrences, 17 of them inside the radiation field. The 5 and 10-years OS was 80±3% and 76±3%, respectively. 5-year OS was significantly better among patients with HD (p=0.000), initial stages (p=0.006), initial CRT treatment (p=0.02), no B symptoms and (p=0.002) and no extranodal disease (p=0.004). These results were similar to expected by stage and histological subtypes in patients without bulky disease.

Conclusions: In our serie, bulky disease was not associated to other recognized poor prognosis factors in lymphomas. As standard therapy, a CRT decreases significantly the recurrence in bulky area and reduces the adverse prognosis of this variable in the OS.

COMPLETE RESPONSE AFTER RADIOTHERAPY IN MANTEL CELL LYMPHOMA

Rubí Olea, L.; Sanchez Belda, M.; Sanmamed Salgado, N.; Herrera Román, M.; Alonso Martínez, P.; Diezhandino García, P.; Garavis Vicente, M.I.; del Valle Rivero, M.L.; López-Lara Martín, F.

Introduction: Mantle cell lymphoma (MCL) is a non-Hodgkin B-cell neoplasm with an aggressive clinical course in approximately 7% of adults, characterized by involvement of the lymph nodes, spleen, blood, and bone marrow with a short remission duration to standard therapies and a median overall survival of 4-5 years. Most patients present with advanced stage disease. Presentation is usually in the sixth decade with male predominance.

Methods and materials: 69 year old man complaining of hearing loss. In TAC study a mass is localized in cavum of 30x25 mm extending to nares, with positive biopsy for lymphoma B mantle classical variant. No suspicious lymphadenopathy. Extension study and bone marrow biopsy were negative. After 3 cycles of chemotherapy, the patient presents partial response with a 22×24 mm mass in CT. Subsequently RTE adjuvant is performed to consolidate response by administering 36 Gy with acceptable toxicity for the patient.

Results: Once the treatment is finished, the patient continues with post-treatment revisions with CT scan at 6 months with total disappearance of the mass. At present, one year after RTE, patient persists free of disease and with no radiotherapy side effects.

Conclusions: Radiotherapy provided effective and lasting local responses in MCL patients and was associated with minimal toxicity. Radiation doses required for most lesions were relatively low and responses were noticed early in the course of treatment. Radiation therapy should be considered early in the course of relapsing, refractory, or localized MCL and may be helpful on occasion for local disease control in patients with chemotherapy-refractory disease.

ENFERMEDAD DE CASTLEMAN TRATADA CON RADIOTERAPIA: A PROPÓSITO DE UN CASO

Flores Sanchez, A.; Wals Zurita, A.; Carrasco Peña, F.; Pachon Ibañez, J.; Abu-Omar Rubio, N.; Marquez Garcia-Salazar, M.; Mesa Saenz, C.M.; Sanchez Calzado, J.A.; Illescas Vacas, A.

Castleman disease is an unusual disease, and more strange is to treat it with radiotherapy, only 25 patients aproximately in the world are described. We have one case to show. Treatment is ongoing.

FOLLOW AFTER RADIOTHERAPY IN HODGKIN LYMPHOMA

Vázquez Hueso, M.V.; Acuña Mora, M.; Pérez Martín, M.M.

Objective, material and methods: Collect epidemiological and clinical data; as well as the evolution of patients treated with radiotherapy for Hodgkin lymphoma.

Results: Between December 2007 and 2012, 8 patients (6 men and 2 women) were treated, with an age range between 16 and 47 years. The predominant histology was nodular sclerosis, except a case of mixed cellularity. There were 2 groups according stadium: 5 had early stage (I-II) and 3, advanced stage (IV). Locating debut was heterogeneous, mediastinum 37%, cervical 25% and 38% other locations, with bulky mass in 50%. The PET imaging test was used in the diagnosis and monitoring. All received QT with ABVD scheme (one case received BEACOPP) followed by radiotherapy with radical intent (3 patients) with doses between 40-41.6 Gy or consolidative intent (5 patients) with doses between 30-36 Gy. In the PET control the complete response was achieved in 75%. The overall survival to 3 years was 100%; estimated overall survival at 4 years, 80% early stages and 66.6% advanced stages. Two deaths were recorded by disease progression, coinciding with patients not achieving complete response.

Conclusion: The estimated long-term survival in these patients, the small number of cases and short analyzed developments make it difficult to know the long-term survival, but was comparable to the developments described in the literature.

PRIMARY CONJUNCTIVAL FOLLICULAR LYMPHOMA TRATED BY VOLUMETRIC MODULATED ARC THERAPY

Diezhandino Garcia, P.; Alonso Martinez, P.; Saornil Alvarez, M.A.; Garcia Alvarez, C.; De frutos Baraja, J.M.; López-Lara Martín, F.

Objectives: Review a primary conjunctiva follicular lymphoma treated by radiotherapy.

Methods: 43 years old patient, derived from ophthalmology with injury several years of evolution in conjunctiva. Differential diagnosis with various benign lesions (follicular conjunctivitis, reactive lymphoid follicular hyperplasia) is performed. Biopsy confirmed the result of primary follicular lymphoma of conjunctiva.

Results: The patient is referred for radiotherapy. Due to the location of the lymphoma, different schedules for minimizing dose in organs at risk are done. 40 Gy was administered with a fractionation of 2 Gy per session using volumetric modulated arc therpy. Tolerance was good, only presented acute conjunctivitis during treatment and superficial punctate keratitis after 2 months that was treated with artificial tears.

Conclusion: Lymphoid proliferations of the eye and ocular adnexa comprise a group ranging from reactive lymphoid hyperplasia to malignant lymphoma. Conjunctiva lymphoma has a very low incidence between primary extranodal lymphomas. Local radiotherapy gives good results in local control with a 94% overall at 10 years. RT dose ranges between 20 and 40 Gy, trying to minimize the dose to organs at risk. The choice of the most appropriate technique is essential for the proper administration of treatment. The volumetric modulated arc therapy allows high doses with a similar conformation to IMRT but with the advantage of managing a faster treatment, minimizing intrafraction eye movements and oftalmologic side effects.

PRIMARY CUTANEOUS HODGKIN LYMPHOMA (HL)

Lozano Martín, E.; Arregui López, E.; Ríos Asus, P.; Lorente Sánchez, M.; Sanz Martín, M.M.; Morera López, R.

Goal and purpose: Report of two cases of primary cutaneous lymphoma hodgkin without associated systemic involvement.

Material and methods: Case 1: 37 year old male with an plate-shaped pink alopecic skin lesion of 20x25 mm diameter in the right temporo-parietal scalp. Histopathological and immunohistochemical study of cutaneous biopsy was interpreted as consistent with cutaneous infiltration by HL. The extension study by ^{18}FDG PET-CT scan showed only a slight detectability (SUV max 2.4) in the temporoparietal skin lesion, bone marrow biopsy showed no significant alterations. Case 2: 78 year old woman presenting a 35x20 mm subcutaneous nodule in right occipital region. Histopathological and immunohistochemical study of the biopsy was interpreted as consistent with nodular subcutaneous infiltration lymphocytic predominance HL. The extension study by ^{18}FDG PET-CT showed only a slight detectability (SUV max 2.1) in the right occipital lesion.

Results: After RT treatment of the lesion with a margin of safety, both patients had a complete clinical and metabolic response.

Conclusions: The exclusively skin involvement in the HL is exceptional. Histological diagnosis is difficult and detection of Reed-Sternberg cells and positivity for CD30 and CD15 with negativity CD45 would support the diagnosis. Clinical follow-up should be careful to exclude systemic progression.

PRIMARY LYMPHOMA OF THYROID: A CASE REPORT

Urquilla, K.B.; Fuertes, F.J.; Reta Decoreau, I.; Lorenzana, P.; Sierra, M.; Martín Urreta, J.C.

The aim of this article is to describe a case of Mucosa-associated lymphoid tissue (MALT) lymphoma of the thyroid gland. Primary thyroid lymphoma (PTL) is a rarely encountered clinical entity that occurs mainly in women in the 6th and 7th decade of life. PTL account only 0.6-5% of all thyroid malignancies and 1-2% of all extra-nodal lymphomas. Hashimoto's desease is found in more than 90% of the reported cases. A 47 year-old woman known for a Hasimoto's desease and painless nodule in the left thyroid lobe. Because of the rapid enlargement of this nodule a core-needle biopsy was performed. Histological examination corresponded to a MALT lymphoma. Inmunohistochemical study showed positivity of CD20 and Bcl2. Staging was made with a CT-SCAN that reported a nodule in the left thyroid lobe of 3.6 cm and a ipsilateral non-specific paratracheal lymph node of 8 mm. Bone marrow biopsy showed no sign of infiltration. A diagnosis of a MALT lymphoma stage IE was made. The patient underwent radical treatment with radiotherapy with a total dose of 30.66 Gy. Post radiation CT-SCAN demostrated the absence of the thyroid nodule and a reduction of the paratracheal lymph node to 3 mm. Shis is followed-up in an endocrine outpatient clinic, showing no signs of recurrence. The prognosis following treatment for Stage I/II MALT lymphoma is excellent, especially in younger patients. Radiotherapy has an important role in the curative treatment of patients with PTL with localized desease.

PRIMARY TESTICULAR DIFFUSE LARGE B-CELL LYMPHOMA: A CASE REPORT

Urquilla, K.B.; Fuertes, F.J.; Sierra, M.; Lorenzana, P.; Martín Urreta, J.C.

The aim of this article is to present a single case of primary testicular lymphoma, its clinical presentation and management. Primary testicular lymphoma constitutes only 1-7% of all testicular neoplasm and less than 1% of all non Hodgkin lymphoma. We review the clinical, histopathological and treatment. We report the case of a 72 year-old man, who presented with a non painful left testicular swelling that he has noticed for several weeks. The patient underwent a radical orchiectomy. Histological examination corresponded to a diffuse lymphomatous infiltration situated in the spermatic chord, affecting in a diffuse manner the left testicle. Inmunohistochemical study showed positivity of MUM-1, Bcl-6 and B-cell marker CD20. Ki-67 proliferation

index was above 90% of neoplasic lymphoid infiltration. The patient underwent full staging for lymphoma with CT-SCAN and bone marrow biopsy. The diagnosis of stage IE primary testicular large B-cell lymphoma was made. Systemic chemotherapy R-CHOP and intratechal prophylaxis was given to the patient. Contralateral prophylactic irradiation of the right testis was performed with a total dose of 30 Gy. Complete remission was achieved in the patient. Primary testicular lymphoma is a rare tumor whose diagnosis is bases on histological findings. There are non consensual etiological or predisposing factors. Treatment modalities consist in surgical excision, chemotherapy and radiation therapy of contralateral testis but accurate procedurtes are not standarized.

PRIMARY TESTICULAR LYMPHOMA

García Escobedo, J.; García Muñoz, R.F.; Alvero Ojeda, P.C.; Lainez Baquero, C.; Galán Rodríguez, C.; Lasa Goicoechea, M.V.

Introduction: We present the treatment on the large B cell diffuse testicular lymphoma (LDCG B).

Clinical case: 65 year old male who refers a tumor in the left testicle. Karnofsky 100%. In the ultrasound scan a heterogenic and hyper-vascular nodule was observed. Radical orchiectomy was carried out and a sample was sent to Pathologic Anatomy, obtaining the LDCG B stage I diagnosis. An extended study was carried out to rule out the disease spreading to the brain, lungs, nasopharynx and extranodal sites. Treatment was started with six courses of chemotherapy alternating with the triple prophylactic therapy for the central nervous system (SNC). Complete remission (RC) with PET was observed following chemotherapy treatment. The treatment was consolidated with conformal radiotherapy 3D to the scrotum and contralateral testis with isocentric mounting with two fields: PA (15 Mev) and AP (6 Mev) with a dose of 32 Gy (2 Gy/fr). Subsequent reviews observed remission in the toxicity secondary to the radiotherapy (radiodermititis G2). Control PET after a year without suspicious images of recurrence; continuous monitoring in Hematology.

Conclusions: Within this rare disease (incidence 0.09-0,26/100.000 people) we should highlight its aggressive character and poor prognosis with a high tendency to systemic propagation. High cure rates can be obtained with early and combined treatment based on radical surgery, chemotherapy and radiotherapy. At present standard treatment consists of applying six courses of R-CHOP every 21 days with intrathecal metrotexate and locoregional radiotherapy, obtaining excellent results with regard to SNC relapses, periods free of disease (74%) and overall survival (85%).

RADIATION THERAPY AS A LOCAL THERAPEUTIC OPTION IN POEMS SYNDROME

Candini, D.; Fernández, E.; Sancho, S.; Martínez, J.; Ramos, A.

Objective: POEMS syndrome is a rare paraneoplastic syndrome that occurs in the setting of a plasma cell dyscrasia. The acronym summarizes its main features: Polyradiculopathy, Organomegaly, Endocrinopathy, Monoclonal gammapathy and Skin changes. We aim to describe the use of local radiotherapy in a patient with systemic symptoms affected by POEMS syndrome.

Materials and methods: A 24-year-old woman was admitted for weakness of lower limbs, abnormal gait and hypopigmented spots on face and body. Physical examination revealed febricula, acropachy, hepatosplenomegaly, supra and infradiaphragmatic adenopathies, bilateral papilledema and paretic gait. A serum monoclonal component (IgG lambda) and a lytic lesion in the posterior wall of the left acetabulum were also found. An adenopathy biopsy revealed Castlemanoid changes, and acetabular bone marrow biopsy was negative for plasma cell infiltration. Since the patient met criteria for localized POEMS syndrome, she received treatment with 3D external radiotherapy on the left ischial sclerous bone lesion, with a 46 Gy total dose divided in 2 Gy daily fractions.

Results: Radiation treatment was well-tolerated, and the patient regained strength in the lower limbs from the third fraction of therapy. After completion of the treatment, the patient could walk with and stand up with support. In subsequent reviews, the patient is still in a good general condition, without evidence of disease (PET negative for tumor) and a normal muscular function.

Conclusions: Radiation therapy is a local and effective option for the treatment of a particular sub-group of patients affected by POEMS syndrome, with quick symptomatic relief and optimal short-medium term response.

RADIOTHERAPY VALUE IN PRIMARY CENTRAL NERVOUS SYSTEM LYMPHOMA: RETROSPECTIVE ANALYSIS

Díaz de Cerio Martínez, I.; Urraca de La Serna, J.M.; Querejeta Ayerra, A.; Uranga Aizpurua, I.; Eguiguren Bastida, M.; Mínguez Manrique, J.; Guimón Olaizola, E.; Blanco García, C.; Ciria Santos, J.P.; Sarasqueta Eizaguirre, C.

Objective: To characterize the prognostic value of cranial irradiation with or without upfront chemotherapy in the treatment of primary central nervous system lymphoma (PCNSL).

Methods: Retrospective study in 36 immunocompetent patients with PCNSL excluding orbital lymphoma from January 2002 to December 2012. Mean age was 62. 47% were men. 81% were diffuse large B-cell lymphoma (DLBCL). Variables from Prognostic Scoring System for Primary CNS Lymphomas from the International Extranodal Lymphoma Study Group (age, ECOG, LDH serum level, CSF protein concentration and involvement of deep regions of brain) were analyzed to give a Score.

Results: 92% (33p) received Chemotherapy (CHT) but just 42% (14p) could complete the whole treatment regimen. Complete response to CHT was achieved in 21% (7p). MTX and R-MVP were used in 61% and 27% respectively. 69.4% (25 p) received Radiotherapy (RT) with or without upfront CHT and complete response was 76% (19 p). Among these, 68.4% (13 p) had disease before radiotherapy. Median follow-up was 16.5 months. Overall survival at 24 and 60 months was 46% and 36%. Median Failure-free survival (FFS) was 14 months. Significant prognostic factors for survival were: score, completing CHT, response to CHT, receiving RT and response to RT. Low grade histology shows a clear trend to improved survival but no statistical significance due to low incidence (2 p).

Conclusion: Response to CHT and the addition of RT after upfront CHT show clear impact in patient outcomes.

RETROSPECTIVE ANALYSIS OF HODKING LYMPHOMA

Folgar, A.; Feltes, N.; Alvarado, A.; Mur, E.; Bonet, M.; Gonzalez, J.; Garcia, M.; Vicente, L.; Cambra, M.J.; Solé, J.M.

Introduction: Hodkings Lymphoma (HL) accounts for about 30% of all lymphomas and its incidence has been steady. Currently, more than 80% of patients with HL can be cured with chemotherapy and involved field radiotherapy.

Objective: To present our experience in the management of HL.

Methods: We conducted a retrospective analysis of patients with HL and treated between January 1996 and December 2014.

Results: We retrospectively studied 61 patients with pathologically confirmed LH. Median age at diagnosis was 37 years (8-78).

Nodular sclerosis was the most; frequent subtype of HL found in 42 patients (70%) and mixed cellularity the second, with 11% of the cases.; The vast majority of our serie were stage I-II. 32 patients (52%) were stage II A and 17 (28%) IA. There were only 8 patients (13%) with symptoms B at diagnosis. ABVD ×4 cycles was the most frequent chemotherapy used in the 32% of patients in our serie. The 25% of patients received 30 Gy, 28% received 36 Gy and the same percentage received 40 Gy, all by involved field radiation therapy (IFRT). The overall survival was 96.7%, with a mean follow up of 72 months.

Conclusion: In our retrospective analysis we found a high overall survival similar to the reported literature data.

SCROTAL IRRADIATION IN PRIMARY TESTICULAR LYMPHOMA: CASE REPORT

Laria Font, C.; Paredes Rubio, S.; Castaño Zuleta, F.A.; Valencia Julve, J.; Bellosta Ferrer, R.

Testicular lymphoma affects 1 to 45 million of men per year. Recurrences may occur in the contralateral testicle, central nervous system (CNS) and extranodal. His prognosis in the literature series is bad, because the testicles (along with the CNS and eye) are called "sanctuaries" (enclaves of resistance to systemic therapies). Studies show that adjuvant radiotherapy over scrotum, after orchiectomy, is associated with improved survival. We present at 65 years old patient, HIV positive, which goes to Urology in July 2012. He had a painless, indurate left testicular since a month earlier. In scrotal ultrasound a tumoral infiltration is seen in left testicle. In August a left inguinal orchiectomy was performed. Histological result is a diffuse lymphoma B cells confined to the testicle. Chemotherapy began with CHOP scheme at November 2012, administered 6 cycles, last one at March 2013. A complete response to treatment was obtained. She was referred to our department for radical treatment on the entire scrotum. Planning CT was performed in the supine position with legs separator and elevation of the scrotum.; We use two opposite fields, (antero-posterior and postero-anterior). We administrate 30 Gy in 15 sessions with good acute tolerance. At present the patient continues follow up without recurrence disease or secondary illness.

SPLENIC IRRADIATION: A PROPOSAL OF 5 CASES

Laria Font, C.; Castaño Zuleta, F.A.; Paredes Rubio, S.; Valencia Julve, J.; Bellosta Ferrer, R.; Bellosta Ferrer, R.; Velilla Millán, C.; Bellosta Ferrer, R.

Splenomegaly is a hallmark of certain hematologic diseases as some myelodysplastic syndromes and chronic myeloproliferative syndromes. Their main consequences are pain, the risk of splenic infarction and the appearance of pancytopenia. In cases where discarded splenectomy, splenic irradiation is a good option since it achieves a high response rate decreased both spleen and improvement of abdominal pain We present five cases of splenomegaly treated from 2012 to 2015, two of them undergoing re-irradiation. The age range is between 69 and 90 years. In all cases, radiotherapy was administered after failure of chemotherapy, after ruling splenectomy for comorbidities. All patients completed treatment but two of them for lack of response and another for high haematological toxicity. For treatment opposing camps were used. The doses administered were varied, three patients received 8 Gy per fraction to 0.5 Gy in 3 fractions a week. One patient received 2 Gy per fraction to 0.2 Gy and another 12 Gy to 1.2 Gy/fraction. Two cases developed a clinical relapse that required re-irradiation, one 8 Gy 0.5 Gy/fraction and the other case with 2 Gy to 0.2 Gy/fraction. In both cases the treatment was well tolerated with low toxicity. Acute tolerance to treatment was good, only one case presenting severe haematological toxicity that forced the suspension of treatment. Upon completion of the study, pain disappeared in all cases, besides a decrease in spleen size is evident. 4 patients are still alive, requiring regular transfusions and only one has died with a median of 6.6 months follow-up.

SURVIVAL ANALYSIS OF NON-HODGKIN LYMPHOMAS: OUR EXPERIENCE

Vazquez Hueso, M.V.; Acuña Mora, M.; Perez Martin, M.M.; Del Castillo Acuña, R; Peracaula Espino, F.J.

Purpose: Review of cases non-Hodgkin lymphoma diagnosed and treated in our department in the period from February 2009-2015.

Methods and materials: The absolute number of diagnoses of lymphoma is 31 patients, of which 74% is NHL with a distribution of 52% for LDCGB, 39% and 9% follicular NHL others. The remaining 26% corresponds to LH. In the case of LDCGB ranked by Ann Arbor staging, 58% were stage III-IV disease at diagnosis Bulky or B symptoms, 33% for stage I-II, without bulky disease or symptoms B. The systemic therapy was based on the traditional scheme universally recognized effectiveness: R- CHOP that was used in 9 patients, 3 of whom had complete response, 5 partial response and only one case progression after chemotherapy. Subsequently, involved-field radiotherapy was performed with intention radical where partial response with a mean dose of 41.4 Gy, 2 consolidation in cases of complete response with a mean dose of 36 Gy, both with standard fractionation. Only one patient with extended illnes at the time of diagnose of total cases, don't achieved complete response after radiotherapy. Disease-free survival ranges from 0 months to 63 months.

Conclusion: Patients who undergone induction chemotherapy achieved complete response at 88% of cases. After period of time evaluated, 55% of patients keep complete response. Same data found on peer-reviewed literature.

TREATMENT OF SPLENOMEGALY WITH LOW DOSES OF RADIATION THERAPY

De la Pinta Alonso, C.; Fernández Lizarbe, E.; Sancho García, S.; Martínez Ollero, J.; Hernánz De Lucas, R.; Ramos Aguerri, A.

Objetives: To evaluate the effectiveness of low doses of radiation therapy for symptomatic splenomegaly in malignant and benign diseases.

Patients and methods: 5 patients with symptomatic splenomegaly were treated with low doses of radiation therapy in our centre (January 2008-December 2014). 4 patients had tumoral pathology (acute myeloid leukemia, non-Hodgkin's lymphoma and prolymphocytic B leukemia) and splenomegaly was caused by extramedullary hematopoiesis. 1 patient had benign pathology (HBV liver cirrhosis) and splenomegaly was caused by vascular ectasia. These patients had exclusively splenic pain or abdominal discomfort in 20%, exclusively cytopenias 40% and both 40%. Patients needed radiation therapy to symptomatic control. Dose per fraction was 0.5 Gy every two days. IGRT were performed in all patients to ensure an appropriate positioning and to adapt the treatment volume to the changes in the spleen volume along the treatment.

Results: Median age 73 (range 61-86). Gender male 1 and female 4. Median craneocaudal length size of the spleen was more than 26 cm (range 15.2-34.9). Total median radiation doses were 4.85 Gy (range 2.5-10). Median craneocaudal spleen size reduction was 4.6 cm. Splenic pain and abdominal disturbances completely improve in all patients. Median increase of haemoglobin

and platelets levels was 1.6 mg/dl and 27.950 cells respectively in the first week after the end of radiotherapy. One patient had to interrupt her treatment due to neutropenia. No other toxicities were described.

Conclusion: Low doses of radiation therapy for treatment of symptomatic splenomegaly were effective, with a low rate of side effects. Splenic pain, abdominal discomfort completely improves and cytopenias rise to secure levels.

UTERINE MALT-TYPE LYMPHOMA. A PURPOSE OF A CASE

Campos Triviño, B.M.; Rodriguez Garcia, E.; Avila Delgado, V.H.; Ortiz Gordillo, M.J.

Objectives: To report clinical case in women 78 years of MALT lymphoma diagnosed uterine. They are rare.

Method: Patient derived from gastroenterology to gynecology by finding endometrial polyp, endometrial polipodeo exploration evidenced, and performs hysteroscopy resection. AP Report: low-grade lymphoma B probably extranodal marginal zone with plasma cell differentiation, Immunohistochemistry: CD20 + CD5 + MNDA + and a second population with plasma cell differentiation with expression CD138/CD79A/CD43/MUM1 molecular study with monoclonal IGH gene rearrangement. Hematology starts chemotherapy with rituximab with minimal response after 4 cycles and persistence of uterine mass reassessment studies, radiotherapy is considered the bulky mass. We value the patient and administered 36 Gy in conventional fractionation; currently pending assess.

Result: MALT lymphoma is a group of non-Hodgkin lymphoma defined as extranodal mucosa-associated lymphoid tissue, occurs most often in the stomach, lung, salivary gland and thyroid; virtually all extranodal sites represents only 2% of all extranodal lymphomas and less than 0.5% of gynecological tumors. They tend to occur in patients with a history of autoimmune disease or chronic inflammatory diseases. In the literature described 10 patients with MALT lymphoma Uterine in the last 10 years; none have been treated with exclusive or complementary radiotherapy.

Conclusions: With the low incidence of endometrial primary lymphoma, a new case can help better understand the pathological features. The choice of treatment (surgery, chemotherapy and radiotherapy alone or in combination) is considered by stage and comorbidities.

OTHERS

4D-CBCT FRAMELESS IMAGE GUIDANCE IN LUNG SBRT: AUTOMATIC OR MANUAL FUSION

Díaz Silvera, C.; Gómez-Tejedor Alonso, S.; Rincón Pérez, M.; Luna Tirado, J.; Penedo Cobos, J.M; Garcia Castejon, M.A.; Pérez Casas, A.M.

Purpose: Verify the correct registration of the 4D automatic fusion algorithm during lung SBRT. Comparison between shifts obtained by 4D automatic fusion algorithm and manual fusion, assuring accurate patient setup.

Methods: Our first six patients who underwent lung SBRT were selected. Radiation treatments were delivered on an Elekta Synergy linear accelerator. Free-breathing helical and 4D image datasets were obtained for each patient. Treatment plans were calculated on the untagged CT image set (4D-UnttagCT). The ITV was designed in a composite images, the MIP (maximum intensity projection) automatically generated. The PTV was created by adding a 5 mm uniform margin to the ITV. Prior to each radiotherapy treatment fraction, a respiratory correlated 4D-CBCT was performed using XVI 4.5. Symmetry. This data allow us to visualize the tumor position in each phase of the respiratory cycle providing 10 phased-based frames. In the clinical procedure, three directions patient shifts were obtained from the automatic fusion between our reference image and the 4D-CBCT using Grey Value 4D (T) automatic registration algorithm from Elekta. Also we manually fused each of 10 frames of the 4D-CBCT versus our reference image and calculate the average three direction shifts, without rotations.

Results: Patients shift (mean±SD) were similar for 4D automatic and manual fusion in the left-right, craniocaudal, and anteroposterior directions. The standard deviation is always higher for manual fusion due to the subjectivity of the physician matching.

Conclusions: Frameless SBRT can be safely administered using Grey Value 4D automatic registration algorithm for 4D-CBCT guidance with no differences surpassing 1.3 mm.

ANTIOXIDANT RADIATION RESPONSE IN TWO DIFFERENT BREAST CANCER CULTURE MODELS

Ríos-Arrabal, S.; Olivares-Urbano, M.A.; Artacho-Cordón, F.; León, J.; Ezzizaoui, J.; Expósito, J.; Martinez-Galán, J.; Argote, A.; Torne, P.; Núñez-Torres, M.I.

Objectives: Three-dimensional cell culture (3D) is a model that better mimic physiologic tissue conditions. By using this model, we propose to study the influence of redox perfil on radiation response in different breast cancer cell lines.

Methods: Two breast cancer cell lines, MDA-MB-231 and MCF-7 were cultured in monolayer (2D) as well as in matrigel- embedded 3D cultures. After receiving a dose of 2 Gy of radiation, we determined the levels of reactive oxygen species (ROS), reduced glutathione (GSH), oxided (GSSG) and glutathione peroxidase (GPx) enzyme activity at different times. Survival curves have also been performed for 2D and 3D in these cell lines.

Results: Radiation doesn´t alter ROS levels in these cell lines when matrigel-embedded 3D cultures were performed. An increase in GSH levels was found 48 hours post-irradiation in MCF-7 for both, 2D and 3D cultures. In MDA-MB-231 cell line, these levels raised 24 and 48 hours after irradiation for 2D and 3D models, respectively. MCF-7 presented higher values of GPx enzyme activity at 0 and 24 hours in 2D model and at 48 and 72 hours in 3D model. In the case of MDA-MB-231 cell line, the GPx activity was higher 0 and 48 hours after irradiation for the 3D model. Both cell lines showed more radioresistance for 3D cultures.

Conclusions: The redox status could be involved in the radioresistance found in 3D cultures for both cell lines.

CANCER STEM CELLS AND IONIZING RADIATION RESPONSE

Olivares-Urbano, M.A.; Jiménez, G.; Ríos-Arrabal, S.; Artacho-Cordón, F.; del Águila-Mejía, J.; León, J.; Expósito, J.; Griñan, C.; Marchal, J.A.; Nuñez-Torres, M.I.

Objectives: Cancer Stem Cells (CSCs) constitute a small subpopulation of cells inside the tumor. Metalloproteinases (MMPs) are regulated by the TIMPs and, epigenetically, by the HDACs. The aim of this study was to establish the proportion of CSCs in the total CSCs populations after radiation and to determine the expression of different enzymes related with the tumor microenvironment (MMPs, TIMPs and HDACs).

Methods: Two breast tumor cell lines (MCF-7 and MDA-MB-231) were used. Positive and negative CSCs were isolated by flow cytometry from the general population. Three sub-population of cells (general, positive CSCs and negative CSCs) were irradiated at different doses (0, 2, 4 and 6 Gy). After 24 hours, we carried out the measurement of gene expression by qPCR. Measured genes in the CSCs positive and CSCs negative sub-populations were MMP-1, MMP-2, MMP-3, MMP-9, MMP-13, HDAC-1, HDAC-2, HDAC-4, TIMP-1 and TIMP-2.

Results: MMP-1, MMP-2, HDAC-4 and TIMP-1 genes were expressed in in both cell lines after irradiation. Besides, MMP-3, MMP-9, MMP-13, HDAC-2 and TIMP-2 were expressed in MDA-MB-231. In CSCs positive were standed out the expression of MMP-2 and MMP-9, which are related to the formation of secondary tumors (invasion and metastasis).

Conclusions: MDA-MB-231 expressed more number of genes related to invasion and metastasis. MMP-2 and MMP-9 are related to the ECM degradation, increasing the invasive capacity of the cells and the later metastasis development. The increased expression of the MMP-2 and MMP-9 in the positive sub-population suggest that these MMPs could be considered as new therapeutic targets in cancer treatment.

INCIDENCE OF MALNUTRITION RISK IN A UNIT OF RADIATION ONCOLOGY

Sanchez Sanchez, E.; Del Castillo Acuña, R.; Muñoz Guerrero, M.J.

Introduction: Cancer is a disease of major public health importance, not only because of its morbidity and mortality, but also the physical and functional consequences that involves. Among these consequences is malnutrition.

Objective: To determine the incidence of malnutrition risk in cancer patients that will be subjected to radiotherapy.

Material and methods: We have done a cross-sectional study during the last year. Nutritional screening was evaluated using the questionnaire Malnutrition Screening Tool (MST) for the diagnosis of malnutrition risk at first visit. this method registers two items: unintentional weight loss and loss of appetite.

Results: A total of 71 patients with prostate cancer were studied, with a mean age of 69.08±7.05 years. Of these, 16.1% had diarrheas, 33.8% rectitis and 8.4% rectal tenesmus. None of the patients have all three symptoms simultaneously, with enteritis and rectal tenesmus most frequently associated, by 9.5%.

Conclusions: Preventive care reduces the incidence of intestinal toxicity in patients receiving radiotherapy for prostate cancer.

MVP/IGF-1R EXPRESSION IN BREAST CANCER TISSUE-ARRAY: MOLECULAR AND CLINICAL IMPLICATIONS

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Introduction: Major Vault Protein (MVP) is related to drug resistance but also increased proliferation, hypoxia and resistance to radiotherapy. No data are published about its role in breast cancer in relation with other molecular markers.

Aim: To explore for the first time the role of MVP in breast cancer and its relation with other molecular markers and oncoproteins.

Methods: Oncogene protein expression analysis was performed in 260 biopsies from a commercially available breast tumor tissue array. Tumour size, nodal involvement, age and menopausal status were already known. Oestrogen and progesterone receptor, Her2Neu expression, IGF-1R and MVP were analyzed by immunohistochemistry.

Results: MVP was positively associated to insulin growth factor receptor type 1 (IGF-1R), estrogen receptor and HER2 overexpression ($p<0.0001$, $p=0.036$ and $p=0.031$, respectively) and appeared as a possible risk factor for breast cancer (Exp (B)=12.796, CI95% 2.662-61.510, $p=0.001$).

Conclusion: MVP is related to oncogene expression inducing cancer proliferation and progression. This study suggests that the expression of MVP should be taking into account as a potential prognostic marker when specific therapies against estrogen receptor, HER2 or IGF-1R have to be used.

NUTRITIONAL STATUS OF HEAD & NECK CANCER PATIENTS DURING RADIOTHERAPY

Gallego Herreros, G.; Hernández, M.E; Hernández, C.; García, M.P.; Alvarez, C.; Garcia, J.; Rodriguez, A.I.; Nieto, A.; Cigarral, C.; Pérez-Romasanta, L.A.

Aims and purposes: H&N cancer patients have high nutritional risk because the side effects of radiotherapy treatment could limit the nutrients intake. We intend to analyze the nutritional evolution of a group of subjects with H&N cancer during radiotherapy.

Material and methods: 38 patients (32 ♂ and ♀ 6) between 28 and 80 years of age with H&N cancer under radiotherapy were evaluated. Weight, height, body composition, arm circumference (anthropometric metallic-ribbon-1 mm), and triceps fold (Harpenden-0.2 mm) were recorded four times along the treatment course.

Results: The patients' average age was 59 years (s.d. 10.9). The initial nutritional status consisted of average weight of 65 kg (49.6-105.9), height of 164.8 cm (7.9), triceps fold of 12.6 mm (5.5), circumference of the arm of 27.1 cm (3.8) and muscle circumference of the arm of 23.1 cm (3.2). The follow-up was 4 weeks (1-9). Between first and 2nd visit the weight loss was -2.5 kg (-10.4, -1.7), decrement of the triceps-fold was -0.6 mm (-2.7,-12.2), and reduction of the muscle circumference of the arm was -0.8 cm (-5.9,-2.4). All these differences were clinically and statistically significant. During successive visits and additional weight loss of 0-4 kg was observed.

Findings: The results reflected weight loss, body fat and muscle mass reduction in all patients. These data lead us to propose the development of a protocol of nutritional evaluation in order to identify early nutritional deterioration.

PROTOCOL OF COMPENSATION FOR PLANNED AND UNPLANNED INTERRUPTIONS IN RADIOTHERAPY

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Aims and purposes: The aim of this work is to formalize the procedures to follow in case of interruption (scheduled or unscheduled) of radiotherapy treatments, analyze their impact on tumor control and evaluate their possible compensation following unified criteria.

Material and methods: The rapidly growing tumors are affected by interruptions. Therefore, three categories (1, 2 and 3) of patients are proposed, depending on the type of disease, according to the need to manage these interruptions. When a scheduled stop or inevitable occurs and it is not possible to transfer patients to another machine, the alternatives are:

— Keep the total treatment time (TTT), the total dose and dose per fraction.
— Keep the TTT, increasing the dose per fraction.
— Accept the extent of TTT administering extra sessions.

Will be mandatory when physician prescribes the treatment dose, start and end date, and the compensatory measures that will initially be made (category 1 and 2) and 3 habitually not be necessary to compensate. During treatment, technicians, nurses and physicists will be responsible for making its findings on different days, which would reduce the chances of forgetting some cases. In the report at end of treatment should appear if there have been interruptions during this and whether compensatory measures have been taken.

Conclusions: At present, has now been launched this protocol in our center, and is conducting a study that is evaluating the compensation for disruption is a good technique to minimize loss of tumor control in many of the diseases treated.

SEMANTIC SUPPORT SYSTEM FOR LUNG CANCER MANAGEMENT

Moreno Conde, J.; Lopez Guerra, J.L.; Moreno Conde, A.; Martínez García, A.; Núñez Benjumea, F.; Ortiz Gordillo, M.; Parra Calderón, C.L.

Objective: This project aims to develop and validate a semantic system for clinical decision support to improve the capacity and reduce the variability in decision making for patients with lung cancer.

Method: To implement this system, we are integrating open source tools including a clinical trial management system for the design and deployment of electronic health records. Oncology information is thus gathered from different research trials, and techniques to manage and maintain all recorded data are included. In addition, the system also integrates a data warehouse which will store information from different data sources including EHR. Besides, dosimetric data will also be exported from radiotherapy treatment planner. For clinical decision support two different approaches are being considered: The use of the RapidMiner to implement algorithms of data mining and data analysis over the information stored in the data warehouse; and the business rule definition using JBoss Guvnor for process modeling based on the oncology clinical guideline.

Results: In this project, we recruited 163 patients with lung cancer from January 2013 to September 2014 and included them into the electronic data records for pneumological oncology. Genotypes of three single nucleotide polymorphisms related with toxicity and survival rate in lung cancer were automatically integrated from other data source. Currently, we are integrating all the information mentioned before with the clinical decision support algorithms based on the international treatment guideline (NCCN).

Conclusions: The development of systems focused on clinical decision support will help to personalize treatments and optimize the use of clinical resources.

SNPS IN TESTOSTERONE METABOLISM GENES AND PROSTATE CANCER PROGRESSION

Henriquez-Hernandez, L.A.; Valenciano, A.; Lara, P.C.; Multicentric Spanish Group of Clinically Localized Prostate Cancer

Aim: Investigate the role of single nucleotide polymorphisms (SNPs) in testosterone metabolism genes in prostate cancer (PCa).

Patients and methods: 494 Spanish patients diagnosed with non-metastatic localized PCa were included in this multicenter study and were genotyped for 32 SNPs in SRD5A1, SRD5A2 and CYP17A1 genes using a Biotrove OpenArray® NT Cycler. Clinical data were available. Genotypic, allelic and haplotype analyses were determined SNPator. All additional statistical analyses comparing clinical data and SNPs were performed using PASW Statistics 15.

Results: The percentage of successful determinations was 97.3%. SNPs SRD5A1-rs3822430 and rs1691053-were associated to PSA level at diagnosis. Moreover, G carriers for both SNPs were at higher risk of present initial PSA levels >20 ng/ml (Exp (B)=2.812, confidence interval (CI) 95% (1.397-5.657), p=0.004) than those AA-AA carriers. Haplotype analyses showed that PCa patients non-homozygous for the haplotype GCTTGTAGTA were at higher risk of present bigger clinical tumor size (Exp (B)=3.823, CI95% (1.280-11.416), p=0.016), and bigger Gleason score (Exp (B)=2.808, CI95% (1.134-6.953), p=0.026).

Conclusions: Single nucleotide polymorphisms in SRD5A1 seem to condition the clinical characteristics of Spanish PCa patients.

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PALLIATIVE CARES

A PROPOS OF A CASE: TREATMENT ONCOLOGIC SEVERE PAIN

Alonso Martínez, P.; Rubi Olea, L.; Sánchez Belda, M.; Diezhandino García, P.; Soto de Prado Otero, D.; Sanmamed Salgado, N.; del Valle Rivero, M.L.; Herrera Roman, M.; Garavís Vicente, M.I.; López-Lara Martín, F.

Introduction: Between 10 and 20% of patients with oncologic pain do not get adequate pain control although the WHO recommendations are followed. For proper treatment is necessary a correct clinical evaluation that identifies the type of pain and provide pharmacological and non pharmacological most appropriate treatment.

Material and methods: 71 year old male diagnosed with metastatic colon carcinoma presenting severe perineal and gluteal neuropathic pain (EVA 7-8) by sacral and anterior rectal tumor invading seminal vesicle.

Results: Tapentadol treatment was started up to doses of 100 mg/12 h and Pregabalin 75 mg/12 h. Was also administered palliative radiotherapy (20 Gy) to sacral and anterior rectal tumors got adequate pain control, with a EVA 2-3 times a week after treatment. At the moment, doses of tapentadol and Pregabalin are gradually diminishing.

Discussion: Neuropathic pain is caused by compression or invasion of the central nervous system, thereby reducing radiotherapy nervous lesions is critical for a good pain control. Currently is not clear the best therapeutic schedule to control this type of pain that usually requires several changes of treatment. The Tapentadol is a new generation drug that has shown in recent studies excellent control of moderate to severe oncologic pain with a better tolerance than previously opioids.

ANTALGIC RADIOTHERAPY IN BONE METASTASES: PATTERNS OF PRACTICE AND SURVIVAL

Torrado Moya, L.; Formoso García, I.; Sosa Fajardo, P.; Fajardo Paneque, I.; Calvo Crespo, P.; Taboada Valladares, B.; Peleteiro Higuero, P.; Carballo Castro, A.M.; Varela Pazos, A.M.; Gómez Caamaño, A.

Aim and purpose: Evaluate the different fraction schedules in the management of painful bone metastases in our department with the purpose of improve the prescription.

Material and methods: We included all patients with painful bone metastases who were treated in our center during 2014. The information was obtained from the "LANTIS" and "IANUS" systems.

Results: A total of 89 patients with bone metastases underwent antalgic palliative radiation therapy (40% of palliative treatments).The commonest primary tumors were: lung (45.6%), breast (10%) and prostate (10%). The most frequent sites of treatment were: vertebrae (39.3%), pelvis (19.1%) and ribs (10.1%). The main fraction schedules, in order of frequency, were: 8 Gy in one fraction (66.7%), 20 Gy in 5 fractions (22.2%) and 30 Gy in 10 fractions (7.8%). The median survival time regarding to the fractionated schedules was: 84 days for 8 Gy, 82.2 days for 20 Gy and 175.1 days for 30 Gy. The average time in days, between treatment and deaths were: 56.7 days for 8 Gy, 79.7 days for 20 Gy and 103.3 days for 30 Gy. The 66.7% of the patients showed clinical improvement (partial or complete pain relief).Re-irradiations were more frequently in the single fraction (13.3%), than in the other schedules.

Conclusions: Our results confirm the effectiveness of hypofractionated schedules in the management of painful bone metastases. If we focus to the median survival time per schedules, we can observe the tendency in our department to use single fraction in those patients with worst short-term prognosis.

CHANGING PATTERNS OF PRACTICE IN PALLIATIVE RADIOTHERAPY (2009/2010 VS 2014)

Formoso García, I.; Torrado Moya, L.; Sosa Fajardo, P.; Fajardo Paneque, I.; Calvo Crespo, P.; Taboada Valladares, M.B.; Peleteiro Higuero, P.; Carballo Castro, A.M.; Varela Pazos, A.M.; Gómez Caamaño, A.

Aims and purpose: Compare the palliative radiotherapy patterns used between 2009/2010 and 2014. In this period of time, began into operation a specific unit of palliative radiotherapy in our department. We developed radiotherapy protocols with the indications and fraction schedules of palliative treatments.

Material and methods: Medical and dosimetry information of the patients treated along 2009/2010 and 2014 was obtained of IANUS and LANTIS systems.

Results: In 2014 we evaluated 306 patients of whom 224 (73%) were treated (bone metastases: 40%; brain metastases: 22%; other: 38%). In the period 2009/2010 498 patients were treated (bone metastases: 34%, brain metastases 25%, other: 41%).; In 2014 the most commonly employed schedules were 1×800 cGy (46%), followed by 5×400 cGy (23%) and 10×300 cGy (21%) while in 2009/2010 were 10×300 cGy (33%), 5×400 cGy (23%) and 1×800 cGy (22%). Analyzing the most common schedules per pathologies we observed: bone metastases 800 cGy (2009/2010: 44%; 2014: 68%) and brain metastases 10×300cGy (2011: 69%; 2014: 60%). The 19% of the patients died in a period of 30 days after complete the radiation treatment (29% in 2011).

Conclusion: As a result of a super specialization in palliative radiotherapy, there is a clear trend towards to a better selection of the patients and shorter fractionated schedules, in our department; that means an optimization of resources and more comfort to the patient.

COULD BE IRRADIATED MSCC WITHOUT PATHOLOGIC CONFIRMATION?

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Objectives: To test irradiation in MSCC (malignant spinal cord compression) without pathologic confirmation of malignancy.

Background: Many cases of MSCC radiation treatment shouldn´t be delayed even pathological findings are not available. We present our experience in these cases.

Material and methods: Seven cases (8%) over 86 p were diagnosed and treated with MSCC without pathological confirmation. Mean age of 56 y (r30-88), gender: male 71% (n=5), female 29% (n=2). Suspected primaries were: Lung 42% (n=3), breast 28% (n=2), prostate 14% (n=1) and hematological malignancies 14% (n=1). Neurological Symptoms were present in 85% (n=6) with motor impairment in 66% (n=4). MRI was performed in 71% (n=5) and CT in 29%. Tumor biomarkers were altered in three cases, showing Ca 19.9 and PSA at least two times higher of normal levels. Treatment doses were 8 Gy in 14% (n=1), 20 Gy in 42% (n=3) and 30 Gy in 42% (n=3).

Results: After mean follow up of 15 months (r:2-15) overall survival was 71%, mean survival of 5.1 months (r:2-10). Ambulatory status was preserved in 71% (n=5) and 57% (n=4) are receiving onco specific treatment.

Conclusion: In some patients radiation intervention is critical to preserve ambulatory status. Therapeutic decision tree algorithm can help to prioritize radiation treatment Further studies increasing sample size can help to guarantee this radiation intervention.

CRANIAL RADIOTHERAPY IN PATIENTS WITH BRAIN METASTASIS. EXPERIENCE IN RADIATION ONCOLOGY SERVICE AT JUAN RAMON JIMENEZ HOSPITAL

Dominguez Rodriguez, M.; Fernandez Cordero, M.J.; Delgado Gil, M.M.; Bayo Lozano, E.

Objectives and purposes: The objective of the study is to assess if after cranial radiotherapy in patients with brain metastasis, we achieve control of neurological symptoms and improved life quality. We found out that brain metastasis is a common cause of morbidity and mortality in patients with cancer (25%), so it is interesting to observe how much we are able to improve cranial irradiation in this circumstance.

Materials and methods: From December 2012 until September 2013, 20 patients treated with cranial radiation in our service were selected. 2 schemes or treatment were used: 18 Gy/600 cGy (95%) each sesión and 30 Gy/300 cGy each sesion for one patient only. 2D simulation with short thermoplastic mask as immobilization technique. 90º and 270º opposed fields and photons 6 MeV. To check neurological symptoms and life quality, patients were interrogated and conducted the EuroQol-5D test in the first visit, at 15 days and at 30 days after the treatment.

Results: Headache was answered 100%. Nausea and vomiting improved 80%, behavioural disturbances 90%, seizures 75%, dizziness 80% and other symptoms (focal deficit, disorientation or instability) in 71.4%. As a result, clinical improvement was accompanied by lower levels of anxiety and increased quality of life.

Conclusions: Brain radiotherapy is the standard treatment in most patients with brain metastasis. Neurological clinical remission rates are achieved. It improves patient life quality and lowers anxiety levels.

EPIDEMIOLOGY OF IRRADIATED METASTATIC SPINAL CORD COMPRESSION IN OUR AREA

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Introduction: Metastatic spinal cord compression (MSCC) is a well recognised complication of cancer and is usually an oncological emergency. In literature, metastases to the spinal column occur in 3-5% of all patients with cancer (most commonly those with breast cancer, prostate cancer and lung cancer, in whom the incidence may be as high as 19%) and may cause pain, vertebral collapse and MSCC. This report examines the epidemiology about irradiated MSCC in our Hospital.

Materials and methods: A descriptive study was performed involving patients with irradiated MSCC due to cancer diagnosed between 2010 and 2014. Clinical and socio-demographic data were extracted from our Departament data base. We study age, sex, type of primary cancer and vertebral localitation.

Results: A total of 87 patients with incident irradiated MSCC were identified. Most were white and male (72%). The mean age was 62.48 years. The most commonly primary cancer localitation was lung (20%), follow by urologic cancer, breast, digestive tract and primary unknown cancer. The principal vertebral localitation was dorso-lumbar spine, (79%).

EPIDURAL SPINAL CORD COMPRESSION SCORE AGREEMENT ACROSS DIFFERENT MEDICAL-SURGICAL SPECIALTIES

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Background: Malignant or metastatic ESCC of the thecal sac is a devastating complication presented by 5% to 20% of patients with spinal metastases. The 6-point ESCC score was developed by oncologic spine surgeons to quantify the degree of ESCC using imaging findings.

Purpose: The purpose of this study was to determine the reliability of: a) the ESCC scoring system, b) the identification of the spinal level presenting ESCC.

Methods: Clinical data and imaging from 90 patients with biopsy-proven spinal metastases, were provided to 83 medical oncologists, radiation oncologists, radiologists, orthopedic surgeons and neurosurgeons from 44 hospitals. The spinal levels presenting metastases and the ESCC scores for each case were calculated twice by each clinician, with a minimum 6 weeks interval. Clinicians were blinded to assessments made by their colleagues and to their own previous assessment. No assessment criteria were established before the study. Kappa statistic was used to assess intra and inter-observer agreement. Subgroup analyses were performed according to clinicians' specialty, years of experience, and type of hospital.

Results: Intra and inter-observer agreement on the location of ESCC was "substantial" (κ>0.61). Intra-observer agreement on the ESCC score was "excellent" (κ=0.81), while inter-observer agreement was "substantial" (κ=0.63). Overall agreement with the tumor board classification was "substantial" (κ=0.713). Results were similar across specialties, years of experience and hospital category.

Conclusions: Agreement in the standardized assessment of metastatic ESCC is high, which can help improve communication among clinicians of different specialties.

HEMOSTATIC PALLIATIVE RADIOTHERAPY IN GASTRIC CANCER: PRACTICE PATTERNS AND OUTCOMES

Formoso García, I.; Torrado Moya, L.; Sosa Fajardo, P.; Fajardo Paneque, I.; Calvo Crespo, P.; Taboada Valladares, M.B.; Peleteiro Higuero, P.; Carballo Castro, A.M.; Varela Pazos, A.M.; Gómez Caamaño, A.

Purpose and objectives: Analyze fractionation schedules and treatment outcomes with hemostatic intention administered in patients with gastric cancer in our department during 2014.

Material and methods: Medical and dosimetry information of the patients treated along 2014 was obtained from IANUS and LANTIS systems.

Results: In 2014 we evaluated 23 patients with gastric cancer and hemostatic intention, of whom 21 (90%) were treated. 57% were stage IV. The provenance of the patients was: 61% hospitalization and ambulatory 39%. The distribution of patients by PS: PS2 (39%) and PS3 (35%). 100% of patients had anemia. 81% required blood transfusion prior to radiation therapy.; In the 86% of patients the bleeding was controlled. 19% were re-irradiated with a single fraction schedule with an average interval of 2.5 months. The median survival was 92 days (4-336) with 24% of patients lived no longer than 30 days. The median interval between firs visit and treatment was 1 day (0-6 days). The most frequent toxicities after treatment were nausea (19%) and vomiting (14%).

Conclusions: The hemostatic radiotherapy treatment in gastric cancer is rarely used. Its high effectiveness and low toxicity profile recommend expanding indications among multidisciplinary committees involved in the treatment of digestive tumors.

INCIDENCE OF PAIN FLARE AFTER PALLIATIVE RADIOTHERAPY FOR BONE METASTASES

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Purpose and objectives: Multicenter prospective study to evaluate the incidence of pain flare following radiotherapy (RT) for painful bone metastases and evaluate its impact on pain control and functionality of the patients.

Materials and methods: Between June 2010 and June 2014, 204 patients were enrolled in this study and 135 patients with complete data were evaluable. All pain medications and worst pain scores were collected before, daily during, and for 10 days after RT. The Brief Pain Inventory (BPI) was fulfilled on the pretreatment and at the 4 weeks follow-up visit.

Results: There were 90 men (66.7%) and 45 women (33.3%). Mean age was 66 years (SD 9.8). The most common primary cancer site was lung in 42 patients (31.1%), followed by prostate in 27 patients (20.0%). Forty-two patients (31.1%) patients received a single fraction of 8 Gy and 83 (61.5%) received 20 Gy in five fractions. The overall pain flare incidence across all centers was 51/135 (37.7%). The majority of pain flares occurred on days 1-5 (88.2%). There were no significant relationships between the occurrence of pain flare and collected variables. All BPI items measured four weeks after end of RT showed significant improvement as compared with pretreatment scores ($p<0.001$). No significant differences in BPI time trends were found between patients with and without flare pain.

Conclusion: Pain flare is a common event, occurring in nearly 40% of the patients that receive palliative RT for symptomatic bone metastases. This phenomenon is not a predictor for pain response.

INTRAMEDULLARY AND INTRAORBITAL METASTASES FROM PRIMARY SMALL CELL LUNG CANCER

Martinez, R.; Alvarez, C.; Latorre, D.R.; Sanchez, M.L.; Sanchez, E.; Orduz, C.; Cucarella, P.

Objectives: To report two cases of intramedullary spinal cord (case 1) and intraorbital (case 2) metastases from primary small cell lung cancer (SCLC). These are low prevalence locations of dissemination.

Materials and methods: Two patients with limited stage SCLC treated with concomitant chemoradiotherapy (CRT) achieving complete response. In case 1, prophylactic cranial irradiation (PCI) was administered. Six months later she referred neuropathic back pain and paresthesias affecting D1-D3 dermatomes. MRI showed a 4 cm centromedullary lesion with edema (SUV max 7.94 g/ml in PET-CT) and a right adrenal lesion (SUV max 13.84 g/mL in PET-CT). In case 2, patient presented proptosis and normal sight acuity one month after completing CRT. MRI showed a 2 cm nodular intraorbitary lesion and several subcentimetric brain metastases. Locoregional progression was discarded in both cases.

Results: In case 1, 3D conformal RT was administered to PTV (GTV-MRI-CT plus a margin) delivering a total dose of 30 Gy in 2 Gy fraction. In case 2, 3D conformal RT was administered to PTV1 (holocraneal and GTV-MRI-CT plus a margin) delivering a dose of 30 Gy in 15 fractions and a 10 Gy boost to PTV2 (GTV-MRI-CT plus a margin) in 5 fractions. Treatment tolerance was acceptable in both patients with complete remission of symptoms.

Conclusions: This treatment approach has demonstrated favourable response with no acute toxicity. We show that symptoms could be managed with an optimized treatment approach according to the local damage of the disease. This entails an important quality of life improvement.

IS IMPORTANT THE NUTRITIONAL ASSESSMENT IN PATIENTS TREATED WITH RADIOTHERAPY?

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Introduction: Malnutrition in cancer patients ranges from 20-80%. It is characterized by anorexia, fatigue, muscular atrophy, organ dysfunction or impaired immunity. It is a problem undervalued. Guidelines as the European Society for Clinical Nutrition and Metabolism (ESPEN) and American Society for Parenteral and Enteral Nutrition (ASPEN) should be implemented. However, less than 1/6 of its recommendations are Grade A and more that 50% are Grade C.

Patients and methods: During 10 months, 277 patients referred to our Department have been nutritionally assessed by the Mini Nutritional Assessment test (MNA®), according with our intervention protocol.

Results: On the first visit the 7.94% of patients were at risk of malnutrition and in the 1.81% malnutrition was established. During treatment, the 3.61% developed risk of malnutrition and the 1.08% malnutrition. Therefore, the 14.44% of patients had nutritional problems. The 57.14% were male, mean age was 66.7 years. The most frequent tumor locations were thorax (38.99%), pelvis (32.85%) and head and neck (14.44%). Of them the 74.29% nedeed nutritional supplements and the 40% responded appropriately stabilizing weight. Enteral administration immunomodulatory substances as L-arginine, omega-3 fatty acids, nucleotides or some vitamins (E, C), recommended by the recommendation ESPEN grade A, improve inflammatory response, wound healing and immune responses, minimizing the therapeutic response to aggression.

Conclusions: Nutritional assessment should be systematically performed at baseline and during cancer treatment, aiming to prevent and reduce malnutrition. Enriched formulas to promote clinical evolution must be used.

MULTIDISCIPLINARY MANAGEMENT OF BONE METASTASES. A CASE REPORT

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Aims and purposes: Pain in cancer patients is an entity that presents frequently but sometimes it has an inscrutable and resistant to treatments course. Therefore, it is necessary to know how to handle it and use the resources that are available. We report here a case of a patient with a very resistant lumbar pain and the therapeutic management that was carried out.

Material and methods: We present a case report of a male patient aged 45, diagnosed of clear cell renal carcinoma T3bN0M1 (lung, adrenal and vertebral in T11 and T12) who consulted because of high intractable back pain VAS 10/10 for which he is admitted to the Radiation Oncology ward. Analgesia dosage is adjusted and progressive improvement was observed without getting full control of symptoms. Afterwards, the patient worsened beginning with intense pain of neuropathic features that failed to be controlled despite dose escalation, opioid rotation and the start of radiotherapy.

Results: Analgesic Radiotherapy treatment was carried out on T10-L1 with a 10×300 cGy fractionation. Because of the difficult analgesic management it was followed by a surgical T11 T12 kyphoplasty by the Traumatology service. After this treatment the patient experienced major symptom improvement allowing to continue with systemic oncological management. In subsequent revisions, excellent pain control was observed.

Conclusion/s: Sometimes we can find a resistant and difficult to manage pain in a patient with bone metastases. Therefore, it is crucial to know what resources are available and occasionally conduct a multidisciplinary handling which will benefit our patients.

NEUROPATHIC PAIN AND BLADDER SPASMS TREATED WITH TAPENTADOL

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Objective: Tapentadol role in patient with pain and bladder spasms treated with radiotherapy (RT).

Material and methods: 75 years old patient, who is referred for adjuvant radiotherapy after radical prostatectomy. Treatment was planned by IMRT, 70 Gy with standard fractionation to a volume of prostatic bed with a safety margin. After the first week of treatment the patient requires catheterization for acute urinary retention and urinary tract infection that was treated with antibiotics. After two failed attempts of catheter removal,

the patient begins with bladder spasms and neuropathic 7/10 degree continuous pain pelvic, disabling him for normal activities of daily living.

Results: The patient starts first step analgesia of the WHO, but requires daily visits for worsening condition secondary to pain. We started treatment with analgesia third step Tapentadol with a minimum dose of 50 mg/12 hours with laxative and antinausea medication. Within 24 hours of the start of treatment the dose is increased to 100 mg/12 hours. That dose gets control pain patient until 10 days after the end of RT.

Conclusion: Bladder spasms can occur after urological surgery and after the placement of a urinary catheter. Tapentadol is a centrally acting opioid with a dual mechanism, mu opioid receptor agonist and CNS inhibitor of norepinephrine reuptake. This drug was able to control neuropathic pain observed in our patient without any side effects.

ONE YEAR OF PALLIATIVE RADIOTHERAPY: PATTERNS OF PRACTICE AND EFFECTIVENESS

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Aims and purpose: Analyze the fraction schedules and the effect of the palliative radiotherapy treatments administered in our department during 2014.

Method and material: Medical and dosimetry information of the patients treated with palliative radiotherapy along 2014 was obtained of IANUS and LANTIS systems.

Results: In the 2014 a total of 224 patients underwent palliative radiotherapy (73% of the 306 patients evaluated). The most frequently pathology treated were: bone metastases (BO) 40%, CNS metastases (CNSM) 22% and gastric bleeding (G) 11%. The treatment regimens more employed per pathology were: 800 cGy in one fraction for MO (68%); 3000 cGy in 10 fractions for CNSM (60%) and 800 cGy in one fraction for G (46%). The commonest fraction schedules in a global analysis were: 800 cGy in one fraction (46%), 2000 cGy in 5 fractions (23.2%) and 3000 cGy in 10 fractions (21%). A partial or complete symptomatic relief was registered in the 73% of the treated patients. The median overall survival was 75 days. The 19% of the patients lived no longer than 30 days after complete the treatment.

Conclusion: There is a clear trend to the election of a shorter fraction schedule in our department. This strategy results effective in the palliation of the symptom, optimizes resources and saves unnecessary hospital visits.

PAIN CONTROL WITH METHADONE IN A PATIENT WITH CANCER AND PRIOR HISTORY OF SUBSTANCE ABUSE

de Ingunza Barón, L.; Monsalvo Hernando, M.; Palomar Muñoz, M.C.; Martin Zamorano, M.

Aim: Methadone is a synthetic opioid that has among its advantages that uses different receptors than others. This means it can be useful in the treatment of cancer pain as second line treatment for neuropathic pain poorly controlled, after the onset of opioid-induced neurotoxicity or in patients who have a history of abuse/dependence during treatment with other opiates.

Material and methods: We report the case of a 52 years old patient with stage IIA colon cancer treated by colectomy and a stage III urothelial cancer which lumbar metastases treated by surgery and chemotherapy. He has maintained uncontrolled pain, invalidating, of lumbosacral retroperitoneal location, for which it has previously received several opioid treatments, having presented addiction to all of them (Abstral, PecFent). Is performed palliative radiotherapy session on the affected vertebrae and rotation to oral methadone, initially with 50 mg/8 hours (later we descend dose while maintaining good control), leaving fast acting fentanyls consuming, with acceptable pain control which allowed him to roam and be independent for basic activities of daily living.

Results and conclusions: In cancer patients with uncontrolled pain may be useful methadone rotation. More experience is needed in the use of this drug. Radiotherapy should be remembered as adjunctive palliative treatment.

RADES SCALE VALIDATION IN MSCC. RESULTS 2014

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Background: MSCC (Malignant spinal cord compression) is an underestimate emergency. To conserve ambulatory status, fast detection and treatment it´s mandatory. We started a prospective study in 2014 to know incidence, treatment schedules and survival to validate rades scale.

Material and methods: 86 cases were treated during 2014, mean age was 63.37 y (r: 27-87). Gender: male 72.1% (n=62) and female 27.9% (n=24). Tumor primaries were lung in 38.4% (n=33), breast 15.1% (n=13) and prostate 11.6% (n=10). Distribution of metastases: dorsal in 72.1% (n=62), cervical 9.3% (n=3), lumbar 17.44% (n=15), sacrum 1.1% (n=1). Treatment doses: 8 Gy 23.3% (n=20), 20 Gy 61.6% (n=53), 30 Gy 14% (n=12) and 45 Gy 1.2% (n=1). Rades groups: GI 45.3% (n=39), GII 30.2% (n=26) and GIII 24.7% (n=21). Ambulatory status was presented in 56% of the patients.

Results: After mean follow up of 14 weeks (r: 0-55) the survival was 48% with mean survival of 3.1 months, (r: 1-12). Regarding Rades score, survival was: 37%, 40% and 71% in groups I, II and III respectively. Patients preserve ambulatory status one week after treatment in 46%.

Conclusion: In our study we could not reach 6 months of follow up so we are not able to validate Rades Score, however our sample size was smaller and institutional study is ongoing to increase our recruitment.

RADIATION THERAPY FOR SQUAMOUS CELL CARCINOMA IN DYSTROPHIC EPIDERMOLYSIS BULLOSA: CASES REPORTS

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Introduction: Dystrophic Epidermolysis bullosa (DEB) is an inherited disease that is clinically expressed by skin fragility and blistering complications. Data from the DEB Research Association of America report an incidence rate of 3.6 per million per year over the period 2007 to 2011. Squamous cell carcinoma (SCC) of the skin is a frequent complication and the main cause of death. We have received two patients with SCC in DEB to radiotherapy treatment associated with chemotherapy or cetuximab.

Materials and methods: Two cases report in men. Both of them were treated with palliative intention. Our first patient, 22 years old man with multiple SCC and a bleeding ulcer in left armpit with clinical impact, was treated with 8 Gy unique session. The bleeding was controlling and there was a significant reduction of tumour without skin toxicities and good tolerance. Patient died two months later for uncontrolled symtomps. The

second patient, 36 years old man received radiotherapy (20 Gy) with analgesic intention associated with cetuximab on left pelvic mass, with excellent pain control. Analgesic treatment was decreased and the pelvic mass was controlled. After four month from radiotherapy, the patient is alive without pain.

Conclusion: There is not enough literature with recommendations on dose and fractionation. Our main limitation was the excessive fragility of the skin that had this type of patients and the possibility of causing excessive toxicity with radiotherapy. In our treatment, we did not observe acute complications despite the high dose per fraction. These patients had a good clinical response.

RADIOTHERAPY RESPONSE IN PATIENTS WITH SPINAL CORD COMPRESSION

De Ingunza Barón, L.; Salas Buzón, C.; Gutierrez Bayard, L.; Díaz Díaz, V.; Villanego Beltrán, I.; Díaz Gomez, L.; Gonzalez Calvo, E.; Jaén Olasolo, J.

Introduction: Between 5% and 20% of patients with spinal metastases develop metastatic spinal cord compression (MSCC) during the course of their disease. Radiotherapy has been considerate one of the principal treatment of this emergency. This report examines the response of metastatic spinal cord compression due radiotherapy or combined therapies.

Materials and methods: A descriptive study was performed involving patients with irradiated MSCC due to cancer diagnosed between 2010 and 2014. Clinical and socio-demographic data were extracted from our Department data base. We studied clinical symptons and response, surgery before radiotherapy (yes/no), radiotherapy fractionation, time of response, re-irradiation and overvall survival. About clinical symptons we made groups: group 0 involves patients only with pain, group 1 involves patients with paresthesia, group 2 involves patients with some alteration of motor function and those with complete paraplegia called group 3.

Results: A total of 87 patients with incident irradiated MSCC were identified. 7 of the total of patients, were operated befote radiotherapy. We usually used hipofractionation like 20 Gy (5 Gy/4 days) in 39% of cases. The second hipofractionation was 8 Gy/1 day (32%). The mean of time of response was 5 months. We did 11 re-irradiations. About 50-100% of pain response was 79% (Group 0), 75% (Group 1), 73% (Group 2), 92% (Group 3). About function motor response in Group 2 was complete in 7% of cases and partial 40%.

Discussion: Radiotherapy is a effective paliative treatment in cases of MSCC in terms of pain control and partial motor function response in our patients. More hipofractionation schemes (like 8 Gy) are a good, well-tolerated and effective options.

REIRRADIATION FOR SUPERIOR CAVA VEIN SYNDROME WITH VMAT

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Purpose: To evaluate the efficacy and toxicity of the palliative effect of retreatment with external beam radiotherapy (VMAT) in symptomatic patients with persistent superior cava vein syndrome.

Methods and materials: A 67 years old man with urotelial carcinoma underwent right nephrectomy in 2007 (pT2 pN0 M0). In 2014 after progressive dyspnea and facial edema objective adenopathic package mediastinum that generate superior cava vein compression. He underwent palliative radiotherapy above all mediastinal lymph node, total dose 26 Gy in 6 fractions of 4 Gy/fx. 5 months later he had new episode of dyspnea showing increase of mediastinal adenopathic package. Other therapeutic options were rejected and we consider new treatment with external radiotherapy.

Results: We pernorfed a reirradiation used a LINAC (Clinac DHX 2100 Varian) with the VMAT technique (RapidArc®). Doses: PTV1: mediastinal package 20 Gy in 5 fractions.Energy: 6 MV photons. After 2 weeks he has clinical improvement.

Conclusion: External beam hypofractionated reirradiation with VMAT can be effective as a palliative. The complication rate of reirradiation was acceptably low.

SCALP MELANOMA METASTASIS WITH VOLUMETRIC MODULATED ARC THERAPY (VMAT) TREATMENT

Alonso Martínez, P.; Sánchez Belda, M.; Diezhandino García, P.; Rubí Olea, L.; Sanmamed Salgado, N.; Alonso Hernandez, D.; del Castillo Belmonte, A.; Herrera Román, M.; Garavis Vicente, M.I.; López-Lara Martín, F.

Introduction: The treatment of the cutaneous metastases of melanoma raises often a therapeutic challenge. The possibilities of obtaining a complete remission in the advanced melanoma are limited. Local treatments like surgery, radiotherapy or immunotherapy are not always viable depending on the number, size and anatomical situation of the tumors. These patients need a palliative treatment, for visible tumors that can be accompanied of local complications and pain. The tumors near the primary eliminated tumor, it names satellitosis; is considered to be a poor prognosis and often they are precursors of systemic disease.

Material and methods: Review of the treatment with radiotherapy (VMAT, 20 Gy) of a 87-year-old woman and a 69-year-old male diagnosed of primary melanoma of the scalp with satellitosis.

Results: In both cases the size, the pain and the bleeding of the tumors were diminished with a great improvement in the quality of life of the patients.

Discussion: Radiotherapy in the metastatic melanomas is a palliative treatment. In the case of satellitosis we can choose several options of planning treatment, being the VMAT one of them. Although the VMAT showed better conformity than the lateral photon-electron plan and acceptable organ at risk sparing, the dose to the hippocampus should be considered when high doses are prescribed.

TAPENTADOL IN THE MANAGEMENT OF OPIOID-NAÏVE PATIENTS WITH CANCER PAIN

López Ramírez, E.; Muñoz Carmona, D.M; Contreras Martínez, J.; de la Torre-Luque, A.

Objectives: To assess the efficacy of Tapentadol in cancer opioid-naïve patients with chronic and/or acute pain.

Material and methods: Between October 2011-February 2013 we performed a prospective observational cohort study with 53 cancer opioid-naïve patients with chronic and/or acute pain treated with tapentadol in 3 Radiotherapy Departments.

Results: Patients 18 women (33.96%), 35 men (66.04%) aged 28-85 years (mean: 62.7). Treatment was suspended due to death in 16.98%, improvement in 5.66%, pruritus in 1.9%, and dizziness in 1.9%. Treatment was continued in 66.03%, and doses increased in 26.41% to achieve analgesia while 7.5% were switched to another drug. The most common cancers: head and neck (32.1%), lung (24.5%), breast (13.2%). Pain was due to: 47.16% tumor;

18.7% bone metastases; 13.21% radiation therapy; 7.55%; benign processes; 7.55%; neuropathic pain; 3.77% visceral metastases. VAS pain pre-treatment was 7.2, post-treatment 3.3 (difference: 3.9 points), while 71.8% progressed to mild pain (VAS≤4). The dose most used was: 50 mg (50.9%). Associated medications were: none (22.64%), rapid-onset fentanyl (60.38%), anticonvulsants (17%), steroids (17%), NSAIDs (13.2%), morphine (5.66%), anxiolytics (1.9%), antidepressants (1.9%), lidocaine 5% (1.9%), acupuncture (1.9%). Analgesic efficacy was achieved in 94.34% of cases. Mean analgesia was reached by 58% of patients and maximum analgesia was 87.5% in one patient; Tapentadol was well tolerated with mild side effects (pruritus, constipation and dizziness) in 4 cases (10.7%).

Conclusions: Our data support the use of Tapentadol in cancer opioid-naïve patients with moderate-to-severe chronic or acute pain (VAS>5). Tapentadol is an effective pain reliever with few side effects.

TREATMENT IN DIFFERENT TYPES OF PAIN IN PATIENT WITH MESOTHELIOMA

De Ingunza Barón, L.; Palomar Muñoz, M.C.; Monsalvo Hernando, M.; Martín Zamorano, M.; López Tinoco, E.

Objectives: In a cancer patient different types of pain that can not control with drug and require other treatments such as radiation therapy or radiofrequency ablation nerve may occur.

Material and methods: The case of a 68-year-old ex-smoker with a history of contact with asbestos, which presents dull pain associated with movement and worsens with them and with deep inspiration on left chest that radiates is presented to back, shoulder, scapula and arm ipsilateral of seven months of evolution. In imaging plural mass is seen infiltrating the chest, suggestive of mesothelioma, which requires the biopsy by thoracotomy because with other tests (thoracentesis, bronchoscopy...) gets not diagnose the injury. After performing thoracotomy other pain appears that unlike the previous pain and is neuropathic. To control pain base is treated with morphine, pregabalin and NSAIDs, but not neuropathic pain is controlled; When treatment modifications are made to control neuropathic pain, pain is uncontrolled base. So it was decided to perform nerve radiofrequency ablation to control neuropathic pain and treat pain with oxycodone base.

Conclusion: In cancer patients with different types of pain and poor control of the same combination of different drug treatments, radiation therapy or invasive procedures such as radiofrequency nerve ablation is necessary.

TREATMENT OF CUTANEOUS METASTASES OF METASTATIC PROSTATE CANCER

Alonso Martínez, P.; Sánchez Belda, M.; Diezhandino García, P.; Rubí Olea, L.; Sanmamed Salgado, N.; del Valle Rivero, M.L.; Herrera Román, M.; Garavis Vicente, M.I.; López-Lara Martín, F.

Introduction: The prevalence of the cutaneous tumors changes between 2 and 10% according to the consulted series. The primary tumor that more frequently originates them is the cancer of breast, followed by the colorectal and lung cancer. The cutaneous metastases of prostate cancer are a very slightly frequent. They demonstrate as solitary or multiple nodular or macular tumors, with or without ulceration added, accompanied of pain, pruritus and bled. The location is changing, being more frequent the abdominal region in genitourinary tumors.

Material and methods: 84-year-old patient, with elephantiasis and hypertension, asymptomatic, in oncology follow-up for Adenocarcinoma of prostate diagnosed in 1991. After hormonal treatment with, he had PSA 279 ng/ml elevation and the onset of multiple cutaneous painful tumors. He started treatment with Abiraterona's Acetate.

Results: For decrease and/or stabilization of the cutaneous tumors, with decrease of pain, external radiotherapy was programmed, planning treatment with volumetric modulated arc therapy.

Conclusions: In the described case, the patient presented local clinical response to the treatment with decrease of the pain and the size of the tumors, improving his PS, which joined to the treatment with A. Abiraterona, allows a good quality of life to the patient and a delay to opioid treatment.

WHEN PAIN RESTRICTS SYMPTOMATIC RADIOTHERAPY PROCEDURE

Gutierrez Bayard, L.; Salas Buzón, M.C.; de Ingunza Barón, L.

Purpose: Radiotherapy`s proven therapy in order to achieve symptomatic relief in the shortest time and with the least toxicity to maintain or increase patients quality of life like pain bone metastases. Pain relief is achieved in 70-80% patients using different fractionation schemes and total dose. However, what do we do when pain suffered by patients limits tolerance requirements for radiotherapy procedure? Our aim was to evaluate efficiency of oral transmucosal fentanyl citrate (OTFC) as analgesic for patients who precise palliative radiotherapy (PR).

Material and methods: We analyzed influence of predictable procedural breakthrough pain (BP) (set-up, mobilization, treatment administration) in candidates for symptomatic radiotherapy and control pain using OTFC. From 2007-2014 we retrospectively reviewed 2187 patients indicating PR, who didn't tolerate set-up requirements and treatment time for BP, and changes in use of OTFC.

Results: Between 2007-2009 11.63% (111) of patients requiring PR (954), received OTFC before receiving radiotherapy, 27.02% (30) who indicated OTFC not tolerated set-up. Between 2010-2014, after review reasons for not proceeding tolerance PR, 26.36% (325) received OTFC (out of 1233), all patients tolerated radiotherapy procedure. Average score OTFC premedication with procedural BP according VAS was 7.5 (range 5-10). Average score after OTFC: 1.8 (1-3). 49% required 200 µg dose, 22% 400 µg, 600 µg 21%, and 8% 800 µg. No undesirable effects were found.

Conclusions: OTFC it`s an useful analgesic for its speed, short effects duration and safety for treatment BP in radiotherapy procedural, allowing tolerance and radiotherapy administration. It´s important consider predictable but limiting procedural breakthrough pain.