PO-1056

Design and implementation of a checklist for intraoperative electron radiotherapy treatments

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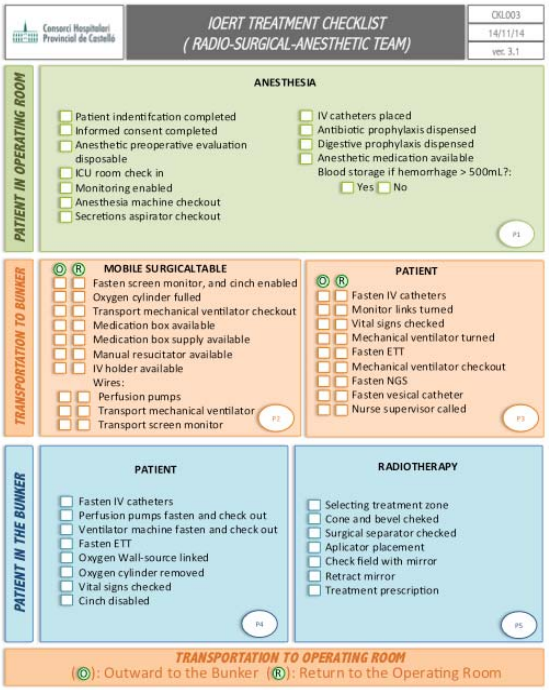
Purpose/Objective: There are general international recommendations about introducing checklists in medical procedures to reinforce patient safety. Specifically, Intraoperative Radiotherapy with electrons (IOERT) is one of these medical procedures thats bring together anesthetic, surgical and radiotherapy procedures. Therefore, our aim is to present the design and implementation of various checklists for IOERT treatments with patient transportation. We adopted a multidisciplinary point of view with the objective of obtain a safety tool that allows greater control in different areas and stages, which the whole procedure comprises.

Materials and Methods: A leading team consisting of a medical physicist, an anesthesiologist, a scrub nurse and a radiation oncologist was set. The team determined which items will be checked, and decided that the lists should be clear and concise. Furthermore, checklists were adjusted to the different areas involved in the procedure. The initial scheme was based on a convenient content to be verified and the timeouts for verifications.

Results: As a result, five checklists were obtained for every area of specialization which recorded the whole process of patient treatment. These lists correspond to the areas of: Medical Physics, Radio-Surgical-Anesthesia, Radiation Nursing, Scrub Nursing and Radiation Therapists. It was determined that the best way of synchronizing the lists was to consider the location of the patient all the time. Therefore, the process is divided into three main sections, corresponding to the three theatres where the patient is during the treatment at our center. The first one is the surgery in the operating room, the second one is the way between the operating room and the linear accelerator bunker, and the last one is the bunker. In every section, different blocks are specified. After every block there is a timeout to verify it. On average, the lists has 33 items and 5 timeouts.Thus, the procedure is interrupted as less as possible. In those blocks where transport occurs, there are a doble checks for the outward and return to the operating room.

The lists were tested and checked by other professionals during real cases of rectal neoplasms, soft tissue sarcomas and breast. They made changes and improvements. It was decided to plasticize the lists and fill them in with pen to protect them from dirt and olso to make them more manageable. They spent about 90 man-hours.



Conclusions: The multidisciplinary work allows to implement a checklist also in the field of IOERT. The decision to use the patient's location with regard to transportation, as a link between the lists, was helpful for harmonizing and interconnecting them, because the lists are different due to the different nature of the tasks, but all have the same structure. The verification is optimized when the number of blocks and timeout is minimal. The set of this checklists presented proved to be invaluable in ensuring safety by themselves and reinforce the quality of treatment along with other actions.

PO-1057

Low-kilovoltage single dose intraoperative radiation therapy for breast cancer

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Purpose/Objective: Targeted intraoperative radiation therapy (IORT) as an alternative to whole breast irradiation has been described for patients with early-stage breast cancer. The randomized phase III TARGiT trial demonstrated similar recurrence rates to WBI and a lower overall toxicity profile on short-term follow-up. We report on our early Latin American surgical experience using the Intrabeam radiotherapy delivery system.

Materials and Methods: Prospectively gathered estrogen receptor-positive, clinically node-negative patients with invasive breast cancer < 2.5 cm receiving using the Intrabeam

system were reviewed. IORT-related effects and early postoperative outcome were assessed.
Results: Seventy eight patients (median age 67 years) underwent lumpectomy, sentinel lymph node biopsy, and concurrent IORT from march 2013 to march 2014. Ninety-five percent of patients had invasive ductal histology with a median tumor size of 1.5 cm.
Conclusions: While a variety of APBI techniques are currently available for clinical use, our early Latin American operative experience with IORT shows it is well tolerated with low morbidity. The addition of WBI may be necessary in situations for positive residual margins or microscopic nodal disease in patients who do not undergo additional surgery. Implementation of IB impacts treatment planning and operating room use in a multidisciplinary breast cancer program. The safety profile, ease of administration, and reduced costs of IB favor its more widespread use in selected patients with early-stage breast cancer.

PO-1058
Dosimetric characterization of INTRABEAMÆ flat and surface applicators for dermatologic applications
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Purpose/Objective: The Intrabeam system is a miniature accelerator emitting a 50 kV isotropic radiation. Its flat and surface applicators convert a spherical dose distribution into a flat one. This study aims at characterizing the dosimetric behaviour of these applicators for dermatologic applications.
Materials and Methods: Dosimetric characterization was carried out in two steps. Firstly characterization was made in standard conditions for dermatologic applications, which is with the applicator directly on contact with the skin. Secondly, characterization was made in more clinical conditions, with obliquities and heterogeneities.
Results: Behaviours of flat and surface applicators are different and have already been studied before. In standard conditions, dose rates and dose distribution results differ from previously published studies due to differences in the x-ray source design. The study showed that when contact between the applicator and the skin of the patient is not perfect there is a dose distribution spread on the edge of the irradiation field where the contact is not made. Dose loss due to lack of backscatter radiations is significant. By contrast, influence of a denser material behind the measurement point has no significant influence on the dose at this point. Thickness of tissue treated with flat and surface applicators is only a few millimetres, depending on the applicator's size.
Conclusions: The INTRABEAM® system with surface and flat applicators is a reliable way of treating superficial cutaneous malignancies as long as there is a good contact between the applicator and the skin.

PO-1059
Feasibility study of in vivo dosimetry for intraoperative irradiation of breast cancer
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Purpose/Objective: The main purpose of this study was to investigate the capability of EBT3 Gafchromic films to measure the delivered dose to the tumour bed and skin for intraoperative radiotherapy under clinical conditions in order to implement a protocol for in vivo dosimetry.
Materials and Methods: This work has been performed using the 50 kV X-ray source from the Intrabeam® instrument (Carl Zeiss, Germany). EBT3 Gafchromic films were characterised within a water phantom and then used for in vivo dosimetry.
Results: EBT3 Gafchromic films were found to be feasible for in vivo dosimetry. Measurements were performed in 10 patients resulting in measured doses from 9.04 to 17.71 Gy in the tumour bed and from 0.87 to 3.98 Gy on the skin.
Conclusions: EBT3 Gafchromic films offered an accurate method for the measurement of both the tumour bed and skin.

Poster: Radiobiology track: Molecular targeted agents and radiotherapy

PO-1060
Combining radiation with the pan-Bcl-2 inhibitor AT-101: in vitro studies and clinical pharmacokinetics in HNSCC
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Purpose/Objective: Head and neck squamous cell carcinoma (HNSCC) is frequently characterized by overexpression of anti-apoptotic Bcl-2 family members. Increased levels of these anti-apoptotic proteins has been associated with radio- and chemoresistance and poor clinical outcome. Inhibition of anti-apoptotic Bcl-2 family members therefore represents an appealing strategy to overcome resistance to anticancer therapies. The aim of this study was to show enhanced radiation-induced tumor cell kill in HNSCC tumor cell lines *in vitro*, upon combined treatment with the pan-Bcl-2 inhibitor AT-101 and radiation. Additionally, we aimed to compare the effective *in vitro* concentrations with human serum levels of AT-101 obtained from a phase I/II trial, to substantiate therapeutic opportunities.