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the book are made in order to fit a country's own cancer treatment program.

EP-2106

Structuring a database to evaluate haematological toxcicity in post-prostatectomy IMRT patients

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Purpose or Objective: Haematological toxicity (HT) in post-prostatectomy patients (WPRT) treated with whole pelvis radiotherapy represents a problem due to the irradiation of a large fraction of the bone marrow (BM). HT is under evaluation in our Institute according to an observational prospective study aiming to explore a dose-effect correlation. Therefore, clinical and dosimetric data have to be collected. This study reports (quantify) the complexity and workload of the clinical data collection were to evaluate its feasibility in the routine clinical practice.

Material and Methods: A database for the enrolled WPRT patients (pts) was created, collecting the following data: clinical features (age, surgery, diabetes, hormonal therapy, results from blood samples at several time points); intent (adjuvant, salvage); technique (step and shot IMRT, Rapid Arc, Helical Tomotherapy); dose-volume histogram (DVH) of BM structures; The time required to fill in database was also evaluated.

Results: To date 238 pts were included in the database. The average age is 66 years (range 48 – 84). Conventionally fractionated (1.8 - 2Gy/fraction, 139 pts) and moderately hypofractioned (2.35-2.65 Gy/fraction, 99 pts), step-and-shoot IMRT (SS-IMRT, n=18), Volumetric Arc (RA IMRT, n=111) or helical tomotherapy (HTT, n=99) EBRT. Adjuvant n = 159 pts, salvage n = 79 pts. The workload to fill in the database was 40 min/pt.

Conclusion: The availability of clinical/dosimetric data was crucial for the dose effect analysis, being HT not negligible. In our experience, the implementation of the database in the routine setting is feasible provided a dedicated operator, such as a radiotherapy technologist (RT), after a simple learning curve to lead the RT to reach the proper expertise.

EP-2107

Work satisfaction and motivation of radiation therapists. A qualitative study

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Purpose or Objective: For more than 120 years radiation therapists (RTT) treat oncology patients in radiation oncology facilities. However, influencing factors on motivation, work performance and work satisfaction of RTTs is still not studied. The aim of this trial was to detect factors influencing work satisfaction and motivation of MTRAs in radiation oncology. Leadership solution approaches will be discussed.

Material and Methods: In a qualitative interview study with seven RTTs at a university clinic we investigated determinants influencing motivation, work and work satisfaction based on the individual experiences of our participants. An inductive thematic content analysis framework was applied to the transcripts.

Results: The interviews were conducted with seven RTTs in our radiation oncology unit. The interview lasted between 40- 60 minutes (mean 52 minutes). All participants were of female sex. Mean age was 46 years (range 30-59 years). Mean work experience in radiation oncology was 19 years (range 3-37 years). All but 2 RTTs were employed fulltime. Three participants have professional experience in diagnostic radiology. All participants declared an interdisciplinary lack of communication between physicians, physicists and RTTs as one of the influencing factors on their work motivation. Furthermore, RTTs receive negative feedback about treatment failures and death of the patients more frequently than results of therapy success. This fact has considerable impact on the motivation of the majority of interviewed RTTs. Additionally, the lack of positive feedback influences the willingness of further education, self-improvement and motivation to recommend the employment as RTTs.

Conclusion: Frequent negative feedback weakens RTTs motivation and work satisfaction. Improved communication about therapy results, especially therapy success, may increase RTTs work motivation. Stabilized motivation may have positive effects on trainee recruitment in radiation oncology.

EP-2108

Gaps in Radiotherapy: What can we do to improve it?

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Purpose or Objective: We want to determine if having a liberated late shift of patients and incorporating hypofractionation protocols in different pathologies makes decreasing the number of lost sessions caused by breakdown and scheduled reviews of treatment units in a 30%, because we can only act on them.

Material and Methods: We compare the data obtained in a management program of treatments (GestRdt) with Excel 2010 software, between the first nine months of 2013 and 2015, because during 2014, hypofractionation new protocols were implemented and a late shift unit treatment was closed. We analyzed the total number of sessions, the total number of patients, the number of sessions per patient, sessions missed by stop-treatment unit and sessions missed by patients in absolute numbers and percentages.

Results: In the year 2013, 1104 sessions (10.11%) were lost and in 2015 were 547 (6.68%). Missed sessions related with the patient and their environment (toxicity, patient-derived and other) was 6.17% in 2013 and 4.79% in 2015, which means a decrease of 22.35%. The percentage of sessions missed by failures and planned outages was 3.94% in 2013 and 1.88% in 2015, representing a decrease of 52.13%. Decreasing of one session per patient in 2015 has generated 768 sessions or free holes in treatment units.

Conclusion: Hypofractionation new techniques and the provision of a free shift of patients have allowed that the reduction of missed sessions related to the treatment units is greater than 50%.

Electronic Poster: RTT track: Position verification

EP-2109

Novel verification technique for craniospinal irradiation with an image plate in the supine position

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Purpose or Objective: It has not yet been possible to confirm the junction of the treated fields for craniospinal irradiation treated in the supine position; the intention of this study was to improve the accuracy of radiation therapy through a technique using an image plate.

Material and Methods: The subjects of this study were 20 medulloblastoma patients who were treated in the supine position in three parts from the brain to the sacrum spinal canal. A half beam was used for the cranial field, and the collimator was rotated with the isocenter set to C-spine level 2. The divergence of the upper spinal field was aligned with the junction of the cranial field; the couch was rotated 270° and the gantry was rotated to align the divergence of the lower spinal field with the inferior border of the upper spinal field. To confirm the junction of the treated field: 1) an image plate (14 x 17 inches) was placed vertically on the couch so that the junction of the cranial field and the upper spinal field would be included in the plate; 2) the cranial field was irradiated to check it; 3) the lateral lock of the couch was released and the isocenter was moved to the image plate before irradiation to check the upper spinal field; and 4) the junction of the cranial field and the upper spinal field was analyzed with a computed radiography reader (CAPSULA XLⅡ, Fujifilm, Japan). The field junction was photographed three times to confirm its accuracy and reproducibility. Two-millimeter or smaller gaps or overlaps were considered setup error. If a 2 mm or greater error was specifically reproduced, the center was moved again through 2D simulation.

Results: The junction of two fields could be confirmed regardless of the degree of enlargement according to the distance between the cranial isocenter and the image plate, with the cranial field as the half beam. The verification images of the 20 patients were measured with a computed radiography reader. Eighteen patients showed a setup error that was smaller than 2 mm, and the center was moved again for two patients who showed the specific reproduction of a gap or overlap of 2 mm or more at the junction. Since the divergences of the upper spinal field and lower spinal field were aligned at the body of the patient and the bottom of the couch, the junction was confirmed by the naked eye by attaching paper to the bottom of the couch.

Conclusion: For craniospinal irradiation patients, treatment in the supine position rather than in the prone position is advantageous for setup stability and airway security. The proposed technique can maintain the homogeneity of the dose because it can accurately confirm the junction of the fields using an image plate.

EP-2110

A study of prostatic calculi: in patients receiving radical radiotherapy for prostate cancer

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Purpose or Objective: Image guided Radiotherapy (IGRT) for prostate cancer (PCA) frequently employs surgically implanted fiducial markers. It is estimated that up to 35% of prostate radiotherapy patient have prostatic calculi (PC) visible on treatment cone beam CT (CBCT). Prostatic calculi present a potential alternative to implanted fiducials. The purpose of this study was to establish the incidence and location of PC in a contemporary population of prostate radiotherapy patients.

Material and Methods: A retrospective single-observer analysis of images from patients with PCA who received RT at our centre was undertaken to identify PCs within the prostate. The Prostate Imaging and Reporting Data System (PI-RADS) graphical schema was used to record the position of PC. Available images from Trans-rectal Ultra-sound(TRUS) brachytherapy volume study scans, CT scans and CBCT scans were analysed from 242 patients.

Results: In total, 394 scan sets from 242 patients were analysed. 57 out of 62 (91%) TRUS images and 153 of 180 (85%) CT planning scans had visible PC. Of the 153 patients with PC visible on CT, 136 also had CBCT scans. All but 1 had corresponding PC on CBCT. 16 TRUS scans had corresponding PCs visible on CT scans but seed artefact obscured visibility in most cases. PC were most frequently observed in sections 3p and 9p (poster of mid gland and apex) of the PI-RADS schema and least often observed in 8a, 12a & 13as (anterior base and apex).

Conclusion: In our series, a significant majority of the prostate radiotherapy patient population have PC detectable on pre-radiotherapy imaging. A prospective clinical trial will commence shortly investigating the feasibility of using PC as an alternative to FMs.

EP-2111

Inter-observer variability in stereotactic IGRT with CBCT: is a CTV-PTV margin needed?

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Purpose or Objective: Use of image guided radiotherapy (IGRT) allows to reduce uncertainty margin from clinical to planning target volume due to better geometric accuracy. Geometric accuracy of Linac-based stereotactic IGRT is reported to be within 2-3 mm and Kilo-voltage cone beam computed tomography (Kv-CBCT) is generally considered as the gold standard for treatment verification. However inter/intra-observer variability in image evaluation may exist. Aim of this report was to conduct a preliminary analysis to quantitatively determine the magnitudes of such inter-observer variations

Material and Methods: Kv-CBCT images were obtained for all patients who underwent stereotactic radiotherapy treatments. They were analyzed both on-line (before treatment delivery) and off-line by two different Radiation Oncologists (RO, M.M. and V.M.) with at least one year of experience in CBCT images verification. Translational displacements in anteroposterior (z), mediolateral (x), and craniocaudal (y) directions were recorded for all verifications and discrepancies between the two RO were calculated. Based on the discrepancies in x, y, and z directions, systematic and random differences were calculated and three-dimensional radial displacement vector was determined. Systematic and random differences were used to derive CTV to PTV margin. Time spent for on-line image verification was also recorded. Results are reported as mean values. The T test was used to assess differences between groups

Results: From January to September 2015, 189 CBCT scans of 48 patients submitted to intracranial (39 scans) or extracranial (150 scans) Linac-based stereotactic radiotherapy were analyzed. An inter-observer discrepancy of ±3 mm on at least one direction was observed in 37 CBCT scans (19.6%). Mean radial discrepancy was 1.82 mm (range 0-11.1 mm). In AP, CC and ML directions, systematic differences were 0.89, 1.87, and 0.67 mm and random discrepancies were 0.43, 0.55, and 0.50 mm, respectively. By van Herk's formula CTV-PTV margins needed to account for such inter-observer variability were 2.5, 5.0 and 2.0 mm in AP, CC and ML directions, respectively. Inter-observer discrepancies were smaller for intracranial than extracranial stereotactic treatment (mean radial discrepancy 1.2 versus 1.9 mm, respectively $p=0.01$).On-line verification of CBCT took a mean time of 4 minute and 14 seconds (range 58 sec - 12 min 25 sec). No significant difference in magnitudes of inter-observer variability was observed according to time spent for verification