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DOSIMETRIC COMPARISON BETWEEN IMRT AND VMAT PLAN IN IRRADIATION FOR LUNG CANCER

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Background: The aim of this study is to verify that for lung cancer treatments an IMRT technique is able to produce a lower dose to total lung in comparison with VMAT. The importance of this approach is to reduce pulmonary toxicity in patients underwent to radiotherapy subsequently to chemotherapy treatment.

Material and Methods: Six patients with peripheral lung cancer (assigned to sequential scheme chemotherapy plus radiotherapy) were selected. PTV (median volume: 80cc) was created by expanding CTV by 0.5cm. OARs delineated included normal lung (double lungs minus GTV), spinal cord, esophagus, and heart. For each patient, one IMRT and 2 VMAT plans (prescription 60Gy) were calculated using a TPS Monaco (statistical uncertainty=1%). In IMRT plan the number of fields was confined to five, VMAT plans (with different geometrical setup) were generated using 2 Partial arcs (PA). VMAT1/VMAT2 use a 220°/200° PA with start stop limit of (250°-110°)/(181°-20°). To evaluate dose distribution of PTV, we calculated V95, Conformity Index (CI) and Homogeneity Index (HI). V5Gy, V10Gy, V20Gy, V30Gy and mean dose values were recorded and compared for normal lung.

Preliminary Results: For all plans, cumulative DVH analysis showed a good PTV coverage (V95>95%) and respected dose limits to OARs according to CORSAIR document. Moreover CI and HI (median value) for IMRT/VMAT1/VMAT2 plans were 0.79/0.82/0.83 and 1.05/1.07/1.09 respectively. Median value of Mean Dose (Gy), V5Gy(%), V10Gy(%), V20Gy(%), V30Gy(%) for normal lung in IMRT plan were 7.9, 28.4, 21.9, 15.3 respectively compared to VMAT1 (9.1, 44.2, 36.6, 15.1) and VMAT2 (8.3, 44.2, 27.7, 14.4). In this study was outlined that VMAT plans slightly improve conformity and homogeneity to PTV but increase normal lung volume receiving low dose (V5Gy-V10Gy). IMRT plans allow, without significantly degrade plan performance, to reduce V5Gy-V10Gy (up to 35%) considered predictors of radiation pneumonitis, and to contain contextually pulmonary side effect for patients which undergo previous chemotherapy too.

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ASSOCIATION OF PERSISTENT URINARY SYMPTOMS WITH QUALITY OF LIFE AFTER PROSTATE CANCER RADIOTHERAPY

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Background: To evaluate persistence and impact on quality of life (QoL) of urinary symptoms after radiotherapy (RT) for prostate cancer (PCa).

Material and Methods: Patient-reported symptoms and QoL from a prospective, multi-institutional study on PCa treated with radical RT (2010-2014) were analyzed. Information was collected at baseline (BL) and follow-ups (FUPs). Patients were included if assessments were present at BL and at least at 3 late FUPs (from 6 months to 5 years). Symptoms were reported with the ICIQ-SF and IPSS questionnaires and defined as "Moderate/Severe Persistent" (MSP) if the median score over late FUPs was >2. BL condition was considered by requiring the median to be worse than BL. The methodology was also applied to the total IPSS, Objective (ICIQ3+4) and Subjective (ICIQ3+4+5) ICIQ scores. QoL was reported with the EORTC-C30 questionnaire. Linear mixed-effects models were used to identify significant differences between groups with/without persistent symptoms and including age, smoking status and diabetes as confounders. Mean QoL differences between groups were evaluated longitudinally over late FUPs.

Preliminary Results: The analysis included 420 patients. Proportions of MPS were: incontinence 6.2%, incomplete emptying 2.4%, frequency 8.1%, intermittency 5.0%, urgency 6.4%, weak stream 9.5%, straining 2.1%, and nocturia 13%. For total scores, proportions were 15%, 9.9% and 6.5% for IPSS, ICIQ Subjective and Objective, respectively. Most symptoms showed significant associations with QoL but with different magnitude. Patients with incontinence, urgency and frequency experienced a worsening of all QoL domains. Largest mean differences were found for Global Health/QoL. Despite being prevalent, nocturia showed no/small QoL differences. Total IPSS and ICIQ Subjective and Objective scores were also associated with all QoL domains. This analysis showed that urinary symptoms after RT for PCa occur with different persistence. Despite being the most prevalent, nocturia was associated with no/small differences in QoL. In contrary, incontinence, frequency and urgency led to larger differences.

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SUPPORTIVE TOOLS FOR A QUALITY AND SAFETY PROCEDURE TO SHORTER TURNAROUND TIMES IN RADIOTHERAPY

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Background: Waiting lists have always been a critical issue in healthcare, especially in radiotherapy departments, where about 50% of cancer patients pass-through during their treatment, which could also include surgery and/or chemotherapy. The purpose of this study is to validate tools in order to reduce turnaround time without affecting the quality and safety of treatment delivery and to ensure fast access to the radiotherapy center.

Material and Methods: The request for treatment "in-a-day" has been available in urgent cases such as patients outside the region; patients with high score on the pain scale suffering from bone metastases; patients with MRI performed almost at the expiration