Definition and evaluation of a template to speed up radiosurgery treatment planning of acoustic neurinomas

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Materials and Methods: The treatment plans of 12 cases of already treated right acoustic neurinomas were analysed. From this retrospective study, a Specific Template for right acoustic neurinoma was created and the Specific Template for left acoustic neurinoma was defined as precisely the mirror of the right template. In total, 19 cases involving acoustic neurinomas have been re-planed with the Specific Template (right or left) and their plan quality assessed. Treatment planning was conducted using the iPlan RT Dose planning system, version 4.5 from BrainLAB. The target volumes ranged from 0.265-7.523 cc (mean: 2.085 ± 1.772 cc) and the prescribed dose was 12-14 Gy (mean: 12.15 ± 0.50 Gy). Treatment plans were generated using 6 dynamic conformal arcs and their quality evaluation was assessed through the calculation of dose-volume indices and dose distribution analysis.

Conclusions: The Specific Template performed better than the Generic Template in terms of conformity (COIN = 0.558 ± 0.034 for the Specific Template and COIN = 0.547 ± 0.034 for the Generic Template) and critical organ sparing (COIN = 0.554 ± 0.031 for the Specific Template and COIN = 0.538 ± 0.031 for the Generic Template). The coverage and the homogeneity of the dose distribution were similar for both: TC = 0.981 ± 0.007, MDPD = 1.065 ± 0.013 for the Specific Template and TC = 0.984 ± 0.007, MDPD = 1.067 ± 0.013 for the Generic Template.

Purpose/Objective: Esophageal toxicity is a common acute side-effect of external radiotherapy for chest tumors. There is no clear relation with different etiologies as esophageal doses, length of irradiated organ, volumes, etc. Dose-volume histogram (DVH) shows several parameters that can help us to understand this toxicity.

Purpose/Objective: Esophageal toxicity is a common acute side-effect of external radiotherapy for chest tumors. There is no clear relation with different etiologies as esophageal doses, length of irradiated organ, volumes, etc. Dose-volume histogram (DVH) shows several parameters that can help us to understand this toxicity. Our objective was to analyze esophageal toxicity at the end of radiotherapy treatment and relate it with the DVH parameters mean dose (Dmean) and maximum dose (Dmax).
Materials and Methods: We analyze 51 patients (48, male; 3 female), aged from 42 to 84 years; diagnosed of lung tumors, and treated with external beam radiotherapy. Radiotherapy treatment was delivered with linear accelerator CLINAC 2100 (Varian). 3D planning was performed with Pinnacle System software (Phillips). For the analysis we select the Dose-Volume Histogram (DVH) parameters mean dose (Dmean) and maximum dose (Dmax). Acute esophageal toxicity was evaluated at end of treatment with the RTOG acute side effects scale.

Results: Median total dose was 60Gy (45-63 Gy). Mediastinal median dose was 50Gy (45-60Gy). Twenty three patients (45%) did not have esophageal toxicity at end of radiotherapy. Grade 1 was achieved in 23 patients (45%), and grade 2 in 5 (10%) (Fig. 1)

Esophageal Dmean:
Dmean range: 23.6-33.2Gy. The median of Dmean in patients without toxicity was 31.6 Gy; in patients with toxicity (grade 1 or 2): 33.2 Gy. This difference was not statistically significant (p=0.77) (Fig. 2)

Esophageal Dmax:
Dmax range: 51-63Gy. The median in patients without toxicity was 58Gy; and median in patients with toxicity (grade 2 or 3): 59.2Gy. These differences were not statistically significant: p=0.289

Conclusions: Esophageal toxicity was mild: 45% of patients did not develop any grade of dysphagia. The median Dmean in the esophagus in patients who developed some degree of toxicity was slightly higher than in patients with no toxicity; however, these differences were not statistically significant, so Dmean can’t help us to predict esophageal toxicity. The median Dmax achieved in the esophagus was slightly higher in patients who experienced toxicity at the end of treatment, but the differences with patients without toxicity were not statistically significant, so we can conclude that the Dmax parameter is not useful for esophageal predict toxicity. In our study the DVH parameters Dmean and Dmax have not been useful in predicting toxicity in patients with external beam radiation. We can’t establish these parameters as predictors of esophageal toxicity. A higher number of patients or the analysis of other DVH parameters could reach a level of statistical significance that allowed relate esophageal toxicity.

Purpose/Objective: Many studies have compared field-in-field (FIF) radiotherapy with conventional radiotherapy using the wedge technique in breast cancer, but a study comparing the effectiveness of these modalities in cervical lymphoma has not yet been reported. The current study was conducted to evaluate the clinical benefit of the FIF technique compared with conventional radiotherapy with physical wedges for the treatment of unilateral cervical malignant lymphoma.

Materials and Methods: Two treatment plans against unilateral cervical malignant lymphoma were generated to 32 patients: for the FIF technique and for the wedge technique. The clinical target volume included the ipsilateral neck node levels I-VI, the parotid area, and the volume of pre-chemotherapy involved lymph nodes plus a 5-mm margin. A total dose of 30 Gy in 15 daily fractions of 2 Gy was planned. To compare the two treatment plans, dose-volume histograms of the planning target volume (PTV), the thyroid, submandibular gland, carotid artery, mucosa, spinal cord, and surrounding normal tissue, and monitor unit (MU) were analyzed. Analyses were performed using the Wilcoxon signed rank test to determine if there was a significant difference in any of the parameters examined.

Results: The FIF technique showed significant reduction in the maximum doses and the volume receiving >107% of the