the linac. Imaging doses in the range of 1.9 mGy–89.3 mGy were measured. These values strongly vary with the imaging modality and the specific position of each TLD. The overall imaging dose as a sum of dose from imaging modalities depends on the imaging procedures and frequency during the course of radiation therapy. The overall imaging dose during the whole course of treatment will be presented. Comparison with literature [2] will be discussed.

Conclusions. As dose reduction is always intended, the presented information may serve as a point of reference. Clinical imaging parameters and procedures may be compared in terms of imaging dose burden to the presented data. Recommendations for clinical imaging parameters or image guidance procedures based on the assessment will be discussed.

References


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[OA033] Comparison of mean lung dose (MLD) obtained with multi-criteria optimization (MCO, RayStation), progressive optimizer (PRO, Eclipse) and predicted by homemade software DosePredictor for patients with stage III non-small cell lung cancer

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Purpose. The aim of this study was to propose a method of mean lung dose (MLD) prediction for III non-small cell lung cancer patients (NSCLC), based on their individual anatomy. The method was validated by comparison with results for volumetric modulated arc therapy (VMAT) plans, obtained with MCO (RayStation, v 5.1) and PRO (Eclipse, v13).

Methods. Dose distributions calculated for each patient in Eclipse for a set of single fields and the method based on linear equations were implemented in a standalone, homemade software (DosePredictor). The software predicts MLD. Prediction results were validated for a group of 21 patients with NSCLC treated in our clinic. Coplanar dynamic two full arcs VMAT plans were prepared with MCO and PRO for each patient. Prescribed dose (PD) of 58.80 Gy was delivered in 21 fractions. For all techniques, the same objectives were used: 95% of PD covering at least 98% of planning target volume, minimization of MLD. The Wilcoxon signed pairs rank test was used to compare predicted MLDs and the ones obtained by MCO and PRO. Correlation between DosePredictor and VMAT plans was examined using Pearson correlation coefficient.

Results. The average MLD was 13.7 Gy [8.5 Gy–20.8 Gy]; 14.0 Gy [8.5 Gy–2.6 Gy]; 14.8 Gy [8.7 Gy–24.3 Gy] for DosePredictor, PRO and MCO respectively. There was no significant difference between predicted MLD and the one calculated with PRO.

For MCO the difference was significant (α = 0.01), but small (1.1 Gy ± 1.2 Gy).

The Pearson correlation coefficient was 0.918 and 0.925 for MCO and PRO respectively.

Conclusions. The method allows to predict MLD for individual patient without necessity of plan preparation. The method can be used to define starting constraints for VMAT optimization or as a guidance for less skilled treatment planners.

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