QA for rapid arc treatment using the SGSMP IMRT – dose intercomparison facility

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Introduction

At the USZ RapidArc treatments are delivered with the Varian Trilogy linac since February 2009. QA is routinely done on a single patient basis with in-house equipment (Epiqa/Octavius). We took advantage of SGSMP IMRT – dose intercomparison facility [1] to have an external QA audit for checking the RapidArc delivery chain. The measurement was done twice – before and after the introduction of the new version of AAA dose calculation algorithm for Eclipse treatment planning system. The present study summarizes obtained results.

Material and Methods

Treatment plans for the CIRS thorax phantom (supplied by the Kinik für Radio-Onkologie of the Kantosspital St. Gallen) were produced with the Eclipse treatment planning system using Progressive Resolution Optimizer (PRO) and Analytical Anisotropic Algorithm (AAA) version 8.2.23 and 8.6.14. Contouring, irradiation and dose measurements in the phantom were performed according to the prescriptions given in the “intercomparison-2008-instructions” [2].

Results

TLD’s inserted in the phantom allow to compare the dose calculated by the planning system with measured dose in 54 positions of a specific slice. Predictions of the older AAA (8.2.23) were in a reasonable overall agreement (on the average less than 2% deviation) with the TLD-measured values. However, a maximum deviation of about 4 % occurred in the region where the PTV extended into the lung. With the new version of the AAA (8.6.14) the deviations between calculated and measured calculated values were generally smaller and never exceeded 2%.

Discussion

With the latest version of the AAA of Eclipse treatment planning system reliable dose calculation is achieved.

Reference

[1] Schiefer H, Seelentag WW, Results of the Pilot study to the IMRT dose intercomparison 2008. STSMP Bulletin 2/2008 66:14-16
[2] http://www.sgsmp.ch/intercomp/intercomparison-2008-instructions.pdf