

AbstractID: 10590 Title: The dosimetric impact of the new 160MLC on head and neck IMRT treatments

Purpose: The purpose of this work is to investigate if the change in plan quality with the finer leaf resolution and lower leakage of the 160 MLC would be dosimetrically significant for head and neck IMRT treatment plans.

Method and Materials: The 160 MLC™ (Siemens Medical Solutions) consists of 80 leaves of 0.5 cm on each bank, a leaf span of 20 cm and leakage of less than 0.37 % without additional back up jaws.

CT image sets of 10 patients of previously treated with stage III and IV head and neck carcinomas (HN) were re-planned on Prowess 4.6 (Prowess Inc., Ca) using the 160 MLC™ (Siemens Medical Solutions, Erlangen, Germany) and the 120 MLC (Varian Medical Systems, Inc., Ca). The underlying beam data for both the treatment units on the planning system were matched to within 1%. IMRT constraints for both 6 MV plans were identical. We compared dose volume histograms (DVHs), minimum, mean and maximum dose to the organ at risks (OAR), the planning target volume (PTV and conformity index.

Results: The dose to the organs at risk were 2 – 5% (i.e 1.5 – 3 Gys for a 70 Gy prescription) lower with the 160 MLC compared to the 120 MLC. The PTV conformity index between the 160 MLC and the 120 MLC were similar. Besides dosimetry, the plans generated on the 120 MLC had multiple split fields resulting in almost double the number of treatment fields..

Conclusion: The large field HN plans generated with the 160 MLC are dosimetrically advantageous for critical structures especially when they are located further away from the central axis, without compromising target volume coverage. The 20 cm leaf span also reduces the number of split fields which is likely to reduce delivery time.

Conflict of Interest (only if applicable): None