

AbstractID: 6430 Title: Eleven years experience of compensator-IMRT clinical application

Purpose:

There are more than 150 radiotherapy centers in the US using compensators to deliver IMRT treatments. However, compensator-IMRT is still not a well-understood technique to many; better knowledge of the technology can encourage acceptance and proper use of this valuable IMRT delivery technology. We will present our compensator-IMRT experience in clinical application using retrospective patient treatment data from eleven years (1100 patients) of compensator-IMRT experience and five years (500 patients) of segmental MLC-IMRT in parallel.

Method and Materials:

IMRT plans are designed by the in-house IMRT TPS P_{LAN}UNC. The resulting continuous intensity maps are used for compensator design. The intensity maps are converted to discrete maps for MLC segment generation if segmental MLC-IMRT technique is used. Compensators are fabricated using a Par Scientific milling machine and granular compensator material. This study uses data from the treatment R&V system and P_{LAN}UNC for both IMRT delivery techniques. IMRT dosimetry is compared between the two IMRT delivery techniques in terms of DVH and EUD.

Results:

Retrospective analysis of more than 200 clinical cases treated at our institution showed that 1) compensator -IMRT treatment delivery time (time lapsed between the beam-on of the 1st field and the beam-off of the last field/segment) is significantly faster than segmental MLC-IMRT, especially for treatments with large number of fields; 2) both IMRT delivery techniques use similar monitor units; and 3) the high spatial resolution compensator-IMRT generally has a similar or better dosimetric quality compared to the segmental MLC-IMRT technique.

Conclusion:

We evaluated both the compensator-IMRT and segmental MLC-IMRT delivery techniques in terms of treatment delivery time, treatment monitor units, and dosimetric quality (DVH and EUD). Our experience demonstrated that the compensator-IMRT technique delivered high quality IMRT dosimetry, fast IMRT treatments, and similar monitor units compared to the segmental MLC-IMRT technique.