

AbstractID:8812Title:Do symmetric compensation of multiple lesions using a multi-leaf collimator (MLC) based intensity modulated radio surgery (IMRS)

**Purpose:** Multi-leaf collimator (MLC) based intensity-modulated radio surgery (IMRS) often results in a large number of monitor units (MU) for patients with multiple brain lesions. Compensation based IMRS, however, may dramatically reduce MU. The purpose of this study is to quantify the reduction of MU for IMRS of multiple brain lesions using solid tissue compensators.

**Method and Materials:** Patients with multiple brain tumors were selected for our study. For each patient, Varian Eclipse TPS was used to generate an MLC based IMRS plan consisting of 10-11 coplanar beams. The prescription dose for a typical IMRS treatment is 1800-2000 cGy delivered in 1 fraction using a 6 MV photon beam. IMRS plans were generated on 2 patients. The optimal fluence maps from IMRS plans were exported to the compensation system to generate compensators for each field. The compensator files are imported back to Eclipse to calculate MUs for the compensator fields. Eclipse TPS was modified to allow compensator based planning and evaluation inside Eclipse. Finally, we compared MLC and compensator plans in terms of MU and target and normal structure coverage.

**Results:** Compensator of fersu perior resolution compared to MLCs and are easier and faster to plan. DVH analysis from both patients shows adequate target coverage for both IMRS and compensator plans. Moreover, the number of monitor units in compensator plan was observed some times. The MUs were reduced by factors of more than 3 compared to MLC based IMRS plan.

**Conclusion:** Compensation based IMRS can dramatically reduce the number of MU needed for multiple brain lesions in radiotherapy as compared to MLC based IMRS plan while preserving the target coverage.

**Conflict of Interest :** This work is partially supported by .decimal Inc.