

AbstractID: 11438 Title: Feasibility Study for Treatment of Intracranial Multi-Focal Stereotactic Radiosurgery with Multiple Intensity Modulated Arc Technique

Objectives: To investigate the feasibility of using an intensity modulated arc technique for multi-focal intracranial stereotactic radiosurgery with a single isocenter setup to significantly decrease the treatment time.

Methods: A Novalis Tx linear accelerator system with a high-definition multi-leaf collimator (HDMLC) was used for treatment. Multiple rotationally modulated beams with HDMLC (RapidArc, Varian Medical Systems) were used for treatment planning. Cone-beam CT (CBCT) images were used for precise localization during treatment delivery. Patients with 2 to 5 lesions that were previously treated with conventional SRS plans using dynamic conformal arc and conformal beams were retrospectively planned with RapidArc™. Single-arc RapidArc™, 5-arc RapidArc™ and conventional SRS plans were compared for target coverage, conformality, dose distribution, and total monitor units.

Results: Target coverage for single-arc RapidArc™, 5-arc RapidArc™ and conventional SRS plans are similar. The conformality and dose distributions of 5-arc RapidArc™ plans are equivalent to or better than conventional SRS plans. However, the conformality and dose distributions of single-arc RapidArc™ plans are slightly poorer than conventional SRS plans, though still reasonable. Overall treatment times with the single- and 5-arc RapidArc™ plans were estimated to be 25% and 30%, respectively, of those of conventional SRS with 5-isocenters.

Conclusion: It is feasible to use intensity modulated arc for stereotactic radiosurgery of multiple intracranial lesions with a single setup. The treatment time can be significantly reduced with this approach.