

## AbstractID: 11601 Title: Volumetric Arc Treatment of Multiple Brain Metastases

**Purpose:** To assess the feasibility of treating a patient with multiple brain metastases using volumetric modulated arc therapy (VMAT).

**Method and Materials:** We calculate dose to a patient with two brain metastases (one in the right occipital lobe and one in the right cerebellum) using a single, 356° dynamic arc with the SmartArc feature in Pinnacle's treatment planning system (Philips, Inc.). The MRI-based gross tumor volumes were expanded isotropically by 3mm and combined to make a single planning target volume. The prescribed dose was 18Gy in 1 fraction, normalized to 80% of the point dose at isocenter. The VMAT plan was compared to a Gamma Knife (GK) plan with a prescription of 18Gy in 1 fraction, normalized to 50% of maximum dose for each lesion with no expansion and to an 8-field IMRT plan with coplanar and non-coplanar static beams with the same prescription as the VMAT plan.

**Results:** Satisfactory coverage was obtained for all plans with a Dmin of 19.8Gy, 17.1Gy and 19.6Gy to the GTV for the VMAT, GK and IMRT, respectively. The conformity index for the VMAT, GK and IMRT plan were 1.28, 1.93 and 1.29, respectively. The volume of normal brain tissue receiving 12Gy for the VMAT, GK and IMRT plans were 8.4, 1.0 and 7.9 cc, respectively. A benefit of the VMAT plan is that it may be delivered in 6.6mins, compared to the GK plan which could take up to 1.5hours.

**Conclusion:** The VMAT dose distribution for a multiple brain metastases patient was equivalent to a conventional IMRT plan. Compared to GK plans, the VMAT plan is more conformal but delivers higher dose to normal brain tissue due to larger margins. We are performing an evaluation of the necessary margin based on setup data at our institution and looking at patients with >2 metastases.