

AbstractID: 5521 Title: Comparison of the Gliasite Radiation Therapy System (RTS) with Intensity Modulated Radiation Therapy (IMRT) for Intracranial Tumors

Purpose: To compare the Gliasite Radiation Therapy System (RTS) to intensity modulated radiation treatment (IMRT) with respect to dose distribution to both the tumor bed and to critical structures.

Method and Materials: At our institution, between January 2002 and January 2005, 30 patients were treated with the Gliasite RTS. A group of 20 patients for whom magnetic resonance imaging (MRI) studies were available was selected out of this sample. Patients were originally treated with the Gliasite RTS to a dose of 6000 cGy prescribed to 1 cm beyond the periphery of the balloon catheter and delivered over 6 days. Utilizing MRI studies with the balloon catheter in place, the same patient group was then planned for IMRT, and the dose distributions to the tumor bed and to critical structures were compared.

Results: The range of Gliasite RTS balloon catheter sizes was 4-35 cc. The range of source activities was 154.2 – 418.8 mCi. The Gliasite RTS delivered significantly less dose to the 50% volumes of critical structures versus IMRT. IMRT delivered significantly more dose to the clinical target volume (CTV) at the 100% (4936 vs. 4351 cGy, $p=0.02$), 99% (5725 vs. 5083 cGy, $p=0.001$), and 95% target volumes (6052 vs. 5723 cGy, $p=0.03$) versus the Gliasite RTS. There was no significant difference between IMRT and the Gliasite RTS with respect to the dose delivered to the 90% volumes of the CTV.

Conclusion: The Gliasite RTS consistently provided more sparing of critical structures compared to IMRT for intracranial tumors. However, IMRT delivered a higher dose to the CTV that more closely approximated the prescribed dose. The choice of treatment modality must be weighed between the desire to protect normal tissue and the need to maximize dose to target volumes.

Conflict of Interest (only if applicable):