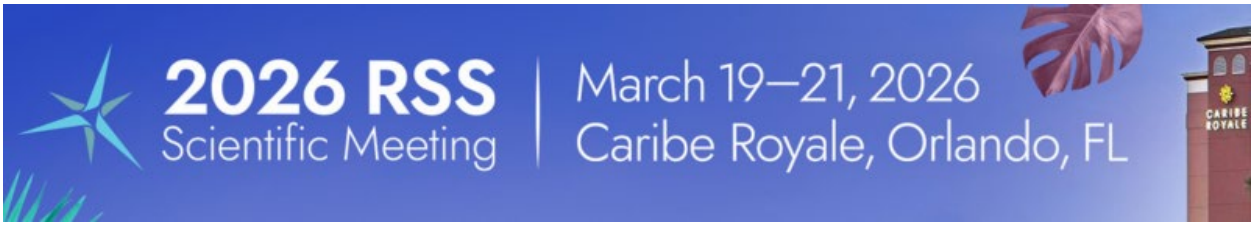

Can Large Brain Metastases Resection Cavities Be Effectively and Safely Treated with Single Fraction Reduced Dose Postoperative Radiosurgery?

Federico Ampil, MD – Louisiana State University Health Sciences Center-Shreveport; Jamie Toms, MD – Louisiana State University Health Sciences Center-Shreveport; Kristie O'Glee, RN – Louisiana State University Health Sciences Center-Shreveport; Julia Trettin, Medical student – Louisiana State University Health Sciences Center-Shreveport; Huy Nguyen, Medical student – Louisiana State University Health Sciences Center-Shreveport; Krystal Mosely, RN – Louisiana State University Health Sciences Center-Shreveport

Objectives: Large brain metastases (BRM), defined as lesions measuring >10 cm3 in volume, treatment using single fraction (SF) radiosurgery has not been favored because of efficacy and safety concerns. Since SF postoperative stereotactic radiosurgery (PSR) with reduced dose (RD) for these sizable intracranial neoplasms and the fixed frame method of head immobilization have been usual practice at our institution, we determined the impact of SF RD PSR on clinical outcomes in these patients with large resection cavities (LRC) of BRM.

Methods: Review of the prospectively maintained radiation oncology database during a 20-year period identified fifty consecutive study participants. Study eligibility required that: 1) The BRM resection cavity was >10 cm3; 2) SF frame-based PSR was performed, and 3) Post-treatment follow-up information was available. RD < 18 Gy for LRC was applied in 41 patients, and 18 Gy was administered in nine patients. The frequencies of local recurrence (LR) and radionecrosis (RN) were the primary endpoints of the study; survival was the secondary measure of treatment.

Results: The median follow-up was 11 months. Comparative analysis of lower versus higher RD revealed: LR rates of 12% (5/41) and 0% (0/9) respectively, p>0.60; corresponding RN rates were 0% (0/41) and 11% (1/9), p>0.40, and the median periods of survival were 8 months and 19 months (p>0.05). In the twenty-five individuals with at least 12 months of follow-up, the local tumor control and RN rates were 84% (21 patients) and 4% (one patient), respectively. In the proven case of RN without observed tumor cells, the V18 Gy normal brain volume was 3.7 cm3.

Conclusion(s): With the found trends of lower LR, slightly more toxicity risk, and better prognosis associated with the application of higher (18 Gy) RD, we believe that the practice of SF RD PSR can be considered a rational treatment strategy in patients with LRC of BRM.