

Patterns of Failure After Stereotactic Radiosurgery for the Treatment of Recurrent High Grade Gliomas

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Introduction

There are no effective strategies for management of tumor progression in this patient population. Re-irradiation with gamma knife stereotactic radiosurgery (SRS) is one method for managing tumor progression, however, it is unclear if this treatment modality is efficacious at achieving local disease control.

Methods

We reviewed 47 consecutive patients treated with gamma knife stereotactic radiosurgery (SRS) for recurrent high grade GBM (grade III and IV) between June 2006 and July 2013. The mean age was 52 years (range, 31-79). 39 patients (85%) and 44 patients (94%) received temozolomide and standard radiation therapy for their initial disease respectively. 7 patients (15%) and 38 patients (81%) underwent surgery or chemotherapy for tumor progression respectively. The mean prescription dose of 17.5 Gy to the 50% iso-dose surface (range, 12-22). We documented local disease control by evaluating failure location (in-field, marginal, distant), failure extent and time to failure

Results

Treatment failure in patients older than 60 years (n=14, 30%) were more likely to be distant from the site of SRS (p=0.035). SRS doses (18-19Gy, 43% of patients) were associated with increased time to treatment failure (p=0.016). Surgery for tumor progression prior to SRS did not significantly affect failure location (p=0.942), extent (p=0.2) or prolong time to treatment failure (p=0.577). Median overall survival following SRS was 5 months with no significant difference between Grade III (n=10; 4.11 months) and IV (n=37; 5.48 months, p=0.686). Initial tumor grade did not significantly affect failure location (p=0.142), extent (p=0.451) or time to failure (p=0.686) following SRS.

Conclusions

Majority of patients with high grade gliomas present with in-field treatment failure following GK SRS. Older patients tend to present with failure further removed from 50% iso-dose line. Surgery for tumor progression did not affect the pattern of tumor failure or time to failure following GK SRS.

Learning Objectives

By the conclusion of the session, participants should be able to:

1. Describe the management of recurrent high grade gliomas
2. Describe the pattern of failure following gamma knife therapy for recurrent high grade glioma

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