Stereotactic radiosurgery for glioblastoma recurrence

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The role of stereotactic radiosurgery in glioblastoma recurrence treatment is a subject of ongoing research, and the approach to treating recurrent GBM can be complex.

Glioblastoma is a highly aggressive and infiltrative brain tumor, and its recurrence is unfortunately common. The treatment of recurrent GBM often involves a multidisciplinary approach, and decisions are based on factors such as the patient's overall health, the location of the recurrent tumor, and the treatments previously received.

Here are some key points regarding the use of stereotactic radiosurgery for recurrent glioblastoma:

Targeted Treatment: Stereotactic radiosurgery delivers highly focused and precise radiation to the targeted area. This allows for localized treatment, sparing surrounding healthy tissue.

Recurrence Management: When glioblastoma recurs, treatment decisions are challenging, and there is no one-size-fits-all approach. Stereotactic radiosurgery may be considered in cases where the recurrent tumor is small and localized.

Combination Therapies: The treatment of recurrent GBM often involves a combination of approaches, which may include surgery, chemotherapy, traditional radiation therapy, and newer targeted therapies. Stereotactic radiosurgery may be used as part of this comprehensive treatment strategy.

Clinical Trials: Due to the limited success of standard treatments for recurrent GBM, patients may be encouraged to participate in clinical trials that explore novel therapies and treatment combinations.

Patient-Specific Considerations: The decision to use stereotactic radiosurgery for recurrent GBM is highly individualized. Factors such as the patient's overall health, the location and size of the recurrent tumor, and the response to previous treatments are all taken into account.

It's important to note that research in the field of glioblastoma treatment is ongoing, and new strategies are continually being explored. The use of stereotactic radiosurgery for recurrent GBM is an area of active investigation, and its role in the overall treatment plan may evolve as more data becomes available.

Case series

In a retrospective cohort study, Zhang et al. set out to examine the relative effects of bevacizumab and Gamma Knife radiosurgery on progression-free survival (PFS) and overall survival (OS) in patients with GBM at first recurrence.

They conducted a retrospective review of all patients with rGBM who underwent treatment with bevacizumab and/or Gamma Knife radiosurgery at Roswell Park Comprehensive Cancer Center between 2012 and 2022. Mean PFS and OS were determined for each of our three treatment groups: Bevacizumab Only, Bevacizumab Plus Gamma Knife, and Gamma Knife Only.

Patients in the combined treatment group demonstrated longer post-recurrence median PFS (7.7 months) and median OS (11.5 months) compared to glioblastoma patients previously reported in the literature and showed improvements in total PFS (p=0.015), total OS (p=0.0050), post-recurrence PFS (p=0.018), and post-recurrence OS (p=0.0082) compared to patients who received either bevacizumab or Gamma Knife as monotherapy.

This study demonstrates that the combined use of bevacizumab with concurrent stereotactic radiosurgery can improve survival in patients with rGBM [1].

Lovo et al. retrospectively reviewed patients who received SRS for recurrent GBM between 1992 and 2020. A total of 46 patients were included in this study. We recorded age at diagnosis, the extent of surgical resection, radiation treatment, chemotherapy regimen, Karnofsky Performance Status at the time of SRS and at last follow-up, use of adjuvant chemotherapy after SRS, and response evaluation criteria in solid tumors. Primary endpoints were OS after initial diagnosis and OS from the date of the SRS procedure. Results Patients received SRS at a median of 10 months (range, 1 to 94 months) after their initial diagnoses. Median follow-up was seven months from the time of SRS and 22.8 months since diagnosis. The estimated median OS for all patients was nine months (range, 1 to 42 months) after SRS and 23.8 months (range, 4 to 102 months) after diagnosis. Median OS after SRS was seven months for patients treated from 1992 to 2011 and nine months for those treated from 2012 to 2020 ($p = 0.008$; $X2 = 7.008$). Median OS for younger patients (i.e., those aged <50 years) was 37.1 months compared to 18.6 months for older patients (i.e., those aged >50 years; $p = 0.04$; $X2 = 3.870$). Patients who received SRS after 10 months since diagnosis had a median OS of 36.2 months versus those who received SRS sooner than 10 months, who had an OS of 15 months ($p = 0.004$; $X2 = 8.145$). Radiosurgery doses larger than 15 Gy correlated with a median survival of nine months versus seven months in those treated with doses <15 Gy ($p = 0.01$; $X2 = 6.756$). Lastly, patients who received adjuvant bevacizumab (BEV) and or chemotherapy after SRS had a median survival of 12 months versus seven months for patients who did not receive any additional therapy after SRS ($p = 0.04$; $X2 = 4.196$). Conclusion SRS focal recurrent GBM in selected patients may improve OS, especially when combined with adjuvant therapy such as BEV and chemotherapy. Other prognostic variables proved relevant such as patients' age, the dose delivered, and surgery-to-SRS time that translates to the time of recurrence. Our results were consistent with the published literature and added to the accumulating evidence regarding SRS in recurrent GBM; however, extensive, multi-center studies are required to make definitive recommendations on this treatment approach [2].

1)

Zhang JF, Okai B, Iovoli A, Goulenko V, Attwood K, Lim J, Hess RM, Abad AP, Prasad D, Fenstermaker

RA. Bevacizumab and gamma knife radiosurgery for first-recurrence glioblastoma. J Neurooncol. 2024 Jan 4. doi: 10.1007/s11060-023-04524-y. Epub ahead of print. PMID: 38175460.
2)

Lovo EE, Moreira A, Barahona KC, Ramirez J, Campos F, Tobar C, Caceros V, Sallabanda M, Sallabanda K. Stereotactic Radiosurgery for Recurrent Glioblastoma Multiforme: A Retrospective Multi-Institutional Experience. Cureus. 2021 Oct 4;13(10):e18480. doi: 10.7759/cureus.18480. PMID: 34754642; PMCID: PMC8569687.