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Efficacy of gamma knife radiosurgery for small-volume recurrent malignant gliomas after initial radical resection.

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Abstract

OBJECTIVE: To review the authors' experience with Gamma Knife radiosurgery (GKR) for small recurrent high-grade gliomas (HGGs) following prior radical resection, external-beam radiation therapy (EBRT), and chemotherapy with temozolomide (TMZ).

METHODS: The authors retrospectively analyzed 26 consecutive adults (9 women and 17 men; median age 60.4 years; Karnofsky Performance Status [KPS]≥70) who underwent GKR for recurrent HGGs from 2004-2009. Median lesion volume was 1.22 cc, and median treatment dose was 15 Gy. Pathology included glioblastoma multiforme (GBM; n=16), anaplastic astrocytoma (AA; n=5), and anaplastic mixed oligoastrocytoma (AMOA; n=5). Two patients lost to follow-up were excluded from radiographic outcome analyses.

RESULTS: Median overall survival (OS) for the entire cohort from the time of GKR was 13.5 months. Values for 12-month actuarial survival from time of GKR for GBM, AMOA, and AA were 37%, 20% and 80%. Local failure occurred in 9 patients (37.5%) at a median time of 5.8 months, and 18 patients (75%) experienced distant progression at a median of 4.8 months. Complications included radiation necrosis in two patients and transient worsening of hemiparesis in one patient. Multivariate hazard ratio (HR) analysis showed KPS 90 or greater, smaller tumor volumes, and increased time to recurrence after resection to be associated with longer OS following GKR.

CONCLUSIONS: GKR provided good local tumor control in this group of clinically stable and predominantly high-functioning patients with small recurrent HGGs after radical resection. Meaningful survival times after GKR were seen. GKR can be considered for selected patients with recurrent HGGs.

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