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## Abstract

**Purpose:** To identify and evaluate the pretreatment and patient factors that would predict for complications after repeat radiosurgery.

**Methods and Materials:** The data from 26 patients who underwent reirradiation with Gamma Knife surgery after a previous procedure in the same or subjacent location were available for evaluation. The range of follow-up was 1–45 months (mean 10). The mean minimal and maximal initial dose and volume for all 26 patients was 16.2 Gy (range 12–22), 31.0 Gy (range 22.2–40.0), and 12.4 cm<sup>3</sup> (range 1.20–70.84), respectively. The mean marginal and maximal repeated radiosurgery dose and volume for all 26 patients was 14.9 Gy (range 12–22.5), 29.7 Gy (range 18.0–45.0) and 12.8 cm<sup>3</sup> (range 1.10–39.20), respectively.

**Results:** Tumor control was significantly better statistically ( $p = 0.0129$ ) for benign tumors (6 of 6, 100% actuarial rate at 4 years) compared with malignant tumors (7 of 20, 35% actuarial rate at 3 years, 3 of 4 metastatic tumors and 2 of 10 primary malignant gliomas). The retreatment volume for radiosurgery correlated significantly with the probability of neurologic decline (any cause) ( $p = 0.0181$ ).

**Conclusion:** Repeat radiosurgery can be performed for recurrent tumors with minimal central nervous system toxicity, especially for benign tumors, with reasonable tumor control.

**Author Keywords:** Reirradiation; Radiosurgery; CNS tumors; Gamma Knife



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