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Stereotactic Radiosurgery For Patients With Ten Or More Brain Metastases

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Abstract

Objectives: To evaluate the efficacy of Gamma Knife radiosurgery (GKRS) as treatment in patients with 10 or more metastatic brain tumors.

Methods: Between February 2014 and January 2016, 20 patients were treated with GKRS for 10 or more brain metastases. We retrospectively analyzed the data from these patients, with survival and tumor control as primary endpoints. Brain volumes treated with 8 Gy and 12 Gy were measured to explore volume of treated tissue as a contributing factor to tumor control. Pre-treatment and post-treatment magnetic resonance imaging (MRI) studies were reviewed at intervals of 3 months, as were patient records on site.

Results: Of the 20 patients treated, 3 were excluded due to insufficient follow-up data. For the 17 included patients the median age was 61 (range 19-76). These patients were treated for a total of 323 tumors, with a median of 17 tumors per patient (10-34). The median survival for these patients was 12.5 months (1.3-16.9). Patient survival was censored at the time of data collection, and the true upper limit of survival is higher than recorded here. The mean percent of brain volume treated was 0.9, with a median of 0.41 (0.07 – 3.38). The mean percent of brain volume that received a dose of 12 Gy was 5.0 (0 – 21.0), and of 8 Gy was 9.0 (1.0 – 31.0). For each of the first three 3-month intervals, the median percent of tumor control was 97%, 96%, and 100%, respectively in the patients with available data.

Conclusions: GKRS effectively treats and controls brain tumors, even in patients presenting with 10 or more tumors simultaneously. The number of tumors initially present was not found to have a significant correlation with general tumor control.

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