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Survival following stereotactic radiosurgery for newly diagnosed and recurrent glioblastoma multiforme: a multicenter experience.

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Abstract

Despite decades of clinical trials investigating new treatment modalities for glioblastoma multiforme (GBM), there have been no significant treatment advances since the 1980s. Reported median survival times for patients with GBM treated with current modalities generally range from 9 to 19 months. The purpose of the current study is to retrospectively review the ability of CyberKnife (Accuray Incorporated, Sunnyvale, CA, USA) radiosurgery to provide local tumor control of newly diagnosed or recurrent GBM. Twenty patients (43.5%) underwent CyberKnife treatment at the time of the initial diagnosis and/or during the first 3 months of their initial clinical management. Twenty-six patients (56.5%) were treated at the time of tumor recurrence or progression. CyberKnife was performed in addition to the traditional therapy. The median survival from diagnosis for the patients treated with CyberKnife as an initial clinical therapy was 11.5 months (range, 2-33) compared to 21 months (range, 8-96) for the patients treated at the time of tumor recurrence/progression. This difference was statistically significant (Kaplan-Meier analysis, $P = 0.0004$). The median survival from the CyberKnife treatment was 9.5 months (range, 0.25-31 months) and 7 months (range, 1-34 months) for patients in the newly diagnosed and recurrent GBM groups (Kaplan-Meier analysis, $P = 0.79$), respectively. Cox proportional hazards survival regression analysis demonstrated that survival time did not correlate significantly with treatment parameters (Dmax, Dmin, number of fractions) or target volume. Survival time and recursive partitioning analysis class were not correlated ($P = 0.07$). Patients with more extensive surgical interventions survived longer ($P = 0.008$), especially those who underwent total tumor resection vs. biopsy ($P = 0.004$). There is no apparent survival advantage in using CyberKnife in initial management of glioblastoma patients, and it should be reserved for patients whose tumors recur or progress after conventional therapy.

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