Radiation response and survival time in patients with glioblastoma multiforme.


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Abstract

The determine the value of radiographically assessed response to radiation therapy as a predictor of survival in patients with glioblastoma multiforme (GBM), the authors studied a cohort of 301 patients who were initially treated according to uniform clinical protocols. All patients had newly diagnosed supratentorial GBM and underwent the maximum safe resection followed by external-beam radiation treatment (60 Gy in standard daily fractions or 70.4 Gy in twice-daily fractions of 160 cGy). The radiation response and survival rates were assessable in 222 patients. The extent of resection and the immediate response to radiation therapy were highly correlated with survival, both in a univariate analysis and after correction for age and Karnofsky performance scale (KPS) score in a multivariate Cox model (p< 0.001 for radiation response and p=0.04 for extent of resection). A subgroup analysis suggested that neuroimaging obtained within 3 days after surgery served as a better baseline for assessment of radiation response than images obtained later. Imaging obtained within 3 days after completion of a course of radiation therapy also provided valid radiation response scores. The impact of the radiographically assessed radiation response on survival time was comparable to that of age or KPS score. This information is easily obtained early in the course of the disease, may be of value for individual patients, and may also have implications for the design and analysis of trials of adjuvant therapy for GBM, including volume-dependent therapies such as radiosurgery or brachytherapy.

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