Gamma Knife Surgery versus Reoperation for Recurrent Glioblastoma Multiforme.

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Abstract
OBJECTIVE: The optimal management of patients with recurrent glioblastoma multiforme (GBM) is a subject of controversy. These patients may be candidates for both reoperation, and/or Gamma Knife Surgery (GKS). Few studies have addressed the role of GKS for relapsing gliomas and the results have not been compared with reoperation. In order to validate the efficacy and safety of GKS, we compared the survival and complication rates of GKS and reoperation for recurrent GBMs.

METHODS: We retrospectively reviewed 77 consecutive patients with histopathologically confirmed GBMs retreated for recurrent GBM between 1996 and 2007. Thirty-two patients underwent GKS, 26 reoperation and 19 both procedures.

RESULTS: Median time from second intervention to tumor progression was longer after GKS than after resection, p=0.009. Median survival after resection was 12 months for the 51 patients receiving GKS compared to 6 months for reoperation only (p=0.001, HR 2.4), and 19 months vs. 16 months from the time of primary diagnosis (p=0.021, HR 1.8). A multivariate analysis adjusted for possible confounding factors (tumor volume, RPA-class, neurological deficits, time to recurrence, adjuvant therapy and tumor location), showed significantly longer survival for patients treated with GKS both from retreatment (p=0.013, HR 4.1) and primary diagnosis (p= 0.002, HR 5.8). The adjusted results were still significant after separate analysis according to tumor volume < 5 cm³, 5-20 cm³ and >20 cm³. The complications rate was 9.8% after GKS and 25.2 % after reoperation.

CONCLUSION: GKS may be an alternative to open surgery for small GBMs at the time of recurrences with a significantly lower complication rate and a possible survival benefit compared with reoperation.

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