

Gamma knife stereotactic radiosurgery for thalamic & brainstem cavernous angiomas.

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Abstract

Objective.

To determine the safety and efficacy of Gamma Knife stereotactic radiosurgery (GKS) in the treatment of patients with symptomatic cavernous angiomas (CA) of the brainstem or thalamus, by comparing overall outcome to the natural history of the disease.

Methods.

Over 10 years a series of 16 consecutively presenting patients (M = 9, F = 7) with thalamic or brainstem CA were treated with GKS to a single lesion, specifically excluding the haemosiderin ring from the target. Within the year prior to treatment eight patients had suffered one symptomatic haemorrhage and eight had suffered more than one symptomatic haemorrhage. Mean age at treatment was

38.9 (15–55) years. Mean prescription dose 13.31 Gray (11.0 Gy–16.0 Gy). Patients were followed up radiologically and, more importantly, clinically for a mean period of 43.8 (11–101) months, median 36 months.

Results.

One patient suffered recurrent haemorrhage at 23 months post-GKS, but has not re-bled in the following 61 months. One patient died of thalamic haemorrhage from the treated lesion at 90 months. One patient was lost to follow up. There have been no other clinical episodes or radiological findings to suggest post-GKS haemorrhage in the remaining 13 patients, and no other complications were observed in the treated population. The annual haemorrhage rate within the first two years post GKS was 3.72% and the annual haemorrhage rate 2 years post GKS was 3.59% per annum.

Conclusion.

With the dose regimens described, GKS is safe and effective in the treatment of thalamic and brainstem CA, as assessed by significant reduction in observed rate of re-haemorrhage over that expected from the known natural history of those CAs which have already demonstrated a tendency to haemorrhage in highly eloquent areas.