1: J Neurosurg. 2008 Sep 26. [Epub ahead of print]

Early brain tumor metastasis reduction following Gamma Knife surgery.

Silva AN, Nagayama K, Schlesinger D, Sheehan JP.

The Lars Leksell Gamma Knife Center, Department of Neurosurgery, University of Virginia Health System, Charlottesville, Virginia.

Object Unlike whole-brain radiation therapy, Gamma Knife surgery (GKS) is delivered in a single session for the treatment of brain metastases. The extent to which GKS can facilitate early tumor control was the focus of this study. Methods The authors reviewed 134 metastatic lesions in 82 patients treated with GKS at the University of Virginia who underwent follow-up MR imaging within 30 days or less of GKS. For accurate volumetry only tumors measuring 0.5 cm(3) or greater in volume were included. Radiological review as well as tumor volumetry was performed to assess the tumor's response to GKS. Tumors were characterized as either enlarged (> 15% volume increase), stable (follow-up volume +/- 15% of the initial volume), or decreased (> 15% volume decrease). A multivariate analysis was performed to determine factors related to each volume outcome group. Results Within the first month following GKS, a decrease was observed in 47.8% of the tumors. Tumor reduction varied according to carcinoma histopathological subtype, with 46.4% of non-small cell lung carcinomas, 70% of breast carcinomas, and 22.6% of melanomas showing volume reduction within 30 days after GKS. The mean volume decrease was 41.7%. For the remaining tumors, 41% were stable and 11.2% increased in volume. The overall analysis showed that there was a significant difference in percentage tumor change according to histopathological type ($p < 0.001$). There was a trend toward increased tumor reduction in those carcinoma types that are traditionally viewed as radiation sensitive (breast and non-small cell lung carcinomas). Conclusions Gamma Knife surgery can offer patients early substantial volume reduction in many brain metastases. In instances in which early volume reduction of limited intracranial disease is desired, GKS may be used alone or before whole brain radiation therapy.

PMID: 18821832 [PubMed - as supplied by publisher]