

1: Technol Cancer Res Treat. 2005 Oct;4(5):571-6

## **CyberKnife Frameless Radiosurgery for the treatment of extracranial benign tumors.**

**Bhatnagar AK, Gerszten PC, Ozhasaglu C, Vogel WJ, Kalnicki S, Welch WC, Burton SA.**

Department of Radiation Oncology, University of Pittsburgh Cancer Institute, 5230 Centre Avenue, Pittsburgh, PA 15232, USA. bhatnagara@upmc.edu

Limited data exists for the use of radiosurgery for benign extracranial tumors. The purpose of this study was to evaluate the feasibility, toxicity, and local control of patients with benign extracranial lesions treated with the CyberKnife Frameless Radiosurgery System. From September 2001 thru January 2004, 59 benign tumors in 44 patients were treated using the CyberKnife a frameless image-guided radiosurgery system. Of these tumors, there were 21 neurofibromas, ten schwannomas, eight meningiomas, eight hemangioblastomas, seven paragangliomas, two hemangiopericytomas, one pseudotumor, one ependymoma, and one arteriovenous malformation (AVM). The anatomic locations of these tumors were spinal (25 cervical, four thoracic, 14 lumbar, and two sacral), neck (eight), orbital (three), brainstem (one), and foramen magnum (one). All patients were treated in a single fraction except three lesions were treated in a fractionated manner. The median treatment delivery time per fraction was 59 minutes (range 11-194). Twenty three lesions initially underwent surgical resection. Ten lesions received prior external beam radiation with a median dose 48 Gy (range 40-54 Gy), and one lesion received two prior CyberKnife treatments for a total dose of 32 Gy to the 80% isodose line. The median follow-up was eight months (range 1-25 months). Acute and late toxicity was graded using the National Cancer Institute Common Toxicity Criteria (CTC) scale. Symptomatic response was documented as "improved," "stable," or "progression". The median tumor dose delivered was 16.0 Gy to the 80% isodose line (range 10-31 Gy). The median tumor volume was 4.3 cc (range 0.14-98.6 cc). The median spinal cord volume receiving more than 8 Gy was 0.035 cc (range 0-2.5 cc) and the median maximum spinal cord dose 11.5 Gy (range 0-19.8 Gy). There were no patients that suffered a significant (Grade 3, 4, or 5) acute toxicity. There was no observed late toxicity. 78% of patients experienced an improvement of their pre-treatment symptoms while only one patient experienced symptom progression. Of the 26 patients who underwent follow-up imaging, the local control rate was 96%. This study suggests that CyberKnife Radiosurgery is a safe and efficacious treatment modality for benign tumors, even for those patients with recurrent previously irradiated lesions.

PMID: 16173828 [PubMed - indexed for MEDLINE]