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Cyberknife radiosurgery for benign meningiomas: short-term results in 199 patients.

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OBJECTIVE: To present initial, short-term results obtained with an image-guided radiosurgery apparatus (CyberKnife; Accuray, Inc., Sunnyvale, CA) in a series of 199 benign intracranial meningiomas. **METHODS:** Selection criteria included lesions unsuitable for surgery and/or remnants after partial surgical removal. All patients were either symptomatic and/or harboring growing tumors. Ninety-nine tumors involved the cavernous sinus; 28 were in the posterior fossa, petrous bone, or clivus; and 29 were in contact with anterior optic pathways. Twenty-two tumors involved the convexity, and 21 involved the falx or tentorium. One hundred fourteen patients had undergone some kind of surgical removal before radiosurgery. Tumor volumes varied from 0.1 to 64 mL (mean, 7.5 mL) and radiation doses ranged from 12 to 25 Gy (mean, 18.5 Gy). Treatment isodoses varied from 70 to 90%. In 150 patients with lesions larger than 8 mL and/or with tumors situated close to critical structures, the dose was delivered in 2 to 5 daily fractions. **RESULTS:** The follow-up periods ranged from 1 to 59 months (mean, 30 months; median, 30 months). The tumor volume decreased in 36 patients, was unchanged in 148 patients, and increased in 7 patients. Three patients underwent repeated radiosurgery, and 4 underwent operations. One hundred fifty-four patients were clinically stable. In 30 patients, a significant improvement of clinical symptoms was obtained. In 7 patients, neurological deterioration was observed (new cranial deficits in 2, worsened diplopia in 2, visual field reduction in 2, and worsened headache in 2). **CONCLUSION:** The introduction of the CyberKnife extended the indication to 63 patients (>30%) who could not have been treated by single-session radiosurgical techniques. The procedure proved to be safe. Clinical improvement seems to be more frequently observed with the CyberKnife than in our previous linear accelerator experience.

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