



Stereotactic radiotherapy for treatment
of cavernous sinus meningiomas

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ABSTRACT

To assess the safety and efficacy of stereotactic radiotherapy (SRT) using a linear accelerator equipped with a micromultileaf collimator for cavernous sinus meningiomas. Forty-five patients with benign cavernous sinus meningiomas were treated with SRT between November 1997 and April 2002. Sixteen patients received definitive treatment on the basis of imaging characteristics of the cavernous sinus tumor. Twenty-nine patients received SRT either as immediate adjuvant treatment after incomplete resection or at documented recurrence. Treatment planning in all patients included CT-MRI image fusion and beam shaping using a micromultileaf collimator. The primary tumor volume varied from 1.41 to 65.66 cm(3) (median, 14.5 cm(3)). The tumor diameter varied from 1.4 to 7.4 cm (median, 3.8 cm). Tumor compressed the optic chiasm or optic nerve in 30 patients. All tumors were treated with a single isocenter plus a margin of normal parenchyma varying from 1 to 5 mm (median, 2.5 mm). The prescribed dose varied from 4250 to 5400 cGy (median, 5040 cGy). The prescription isodose varied from 87% to 95% (median, 90%). The maximal tumor dose varied from 5000 to 6000 cGy (median, 5600 cGy). The follow-up varied from 12 to 53 months (median, 36 months).

SUMMARY

The actuarial 3-year overall and progression-free survival rate was 100% and 97.4%, respectively. One patient (2%) developed local relapsed at 18 months. A partial imaging response occurred in 18% of patients, and the tumor was stable in the remaining 80%. Preexisting neurologic complaints improved in 20% of patients and were stable in the remainder. No patient, tumor, or treatment factors were found to be predictive of imaging or clinical response. Transient acute morbidities included headache responsive to nonnarcotic analgesics in 4 patients, fatigue in 3 patients, and retroorbital pain in 1 patient. No treatment-induced peritumoral edema, cranial neuropathy, endocrine dysfunction, cognitive decline, or second malignancy occurred. One patient had an ipsilateral cerebrovascular accident 6 months after SRT.

CONCLUSION

Stereotactic radiotherapy is both safe and effective for patients with cavernous sinus meningiomas. Field shaping using a micromultileaf collimator allows conformal and homogeneous radiation of cavernous sinus meningiomas that may not be amenable to single-fraction stereotactic radiosurgery because of tumor size or location. Additional clinical experience is necessary to determine the position of SRT among the available innovative fractionated RT options for challenging skull base meningiomas.