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Proton Stereotactic Radiosurgery for the Treatment of Benign Meningiomas.

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Abstract

PURPOSE: Given the excellent prognosis for patients with benign meningiomas, treatment strategies to minimize late effects are important. One strategy is proton radiation therapy (RT), which allows less integral dose to normal tissue and greater homogeneity than photon RT. Here, we report the first series of proton stereotactic radiosurgery (SRS) used for the treatment of meningiomas.

METHODS AND MATERIALS: We identified 50 patients with 51 histologically proven or image- defined, presumed-benign meningiomas treated at our institution between 1996 and 2007. Tumors of <4 cm in diameter and located ≥2 mm from the optic apparatus were eligible for treatment. Indications included primary treatment (n = 32), residual tumor following surgery (n = 8), and recurrent tumor following surgery (n = 10). The median dose delivered was 13 Gray radiobiologic equivalent (Gy[RBE]) (range, 10.0-15.5 Gy[RBE]) prescribed to the 90% isodose line.

RESULTS: Median follow-up was 32 months (range, 6-133 months). Magnetic resonance imaging at the most recent follow-up or time of progression revealed 33 meningiomas with stable sizes, 13 meningiomas with decreased size, and 5 meningiomas with increased size. The 3-year actuarial tumor control rate was 94% (95% confidence interval, 77%-98%). Symptoms were improved in 47% (16/ 34) of patients, unchanged in 44% (15/34) of patients, and worse in 9% (3/34) of patients. The rate of potential permanent adverse effects after SRS was 5.9% (3/51 patients).

CONCLUSIONS: Proton SRS is an effective therapy for small benign meningiomas, with a potentially lower rate of long-term treatment-related morbidity. Longer follow-up is needed to assess durability of tumor control and late effects.

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