Reference 8.)


Abstract

BACKGROUND:
To assess the long-term clinical results of spot scanning proton therapy (PT) in the treatment of intracranial meningiomas.

PATIENTS AND METHODS:
Thirty-nine patients with meningioma (histologically proven 34/39) were treated with PT between July 1997 and January 2010. Thirty-two (82.1%) patients were treated as primary treatment (exclusive PT, n = 8; postoperative PT, n = 24). Mean age was 48.3 ± 17.9 years and 32 (82.1%) patients had skull base lesions. For patients undergoing surgery, 24 patients had a diagnosis of World Health Organization (WHO) Grade I and 10 of a WHO Grade II/III meningioma, respectively. The female-to-male ratio was 3.3. The median administered dose was 56.0 Gy (relative biologic effectiveness [RBE]) (range, 52.2-66.6) at 1.8-2.0 Gy (RBE) per fraction. Gross tumor volume (GTV) ranged from 0.76 to 546.5 cm(3) (median, 21.5). Late toxicity was assessed according to Common Terminology Criteria for Adverse Events version 3.0. Mean follow-up time was 62.0 months and all patients were followed for >6 months.

RESULTS:
Six patients presented with tumor recurrence and 6 patients died during follow-up, of which 4 of tumor progression. Five-year actuarial local control and overall survival rates were 84.8% and 81.8%, respectively, for the entire cohort and 100% for benign histology. Cumulative 5-year Grade ≥3 late toxicity-free survival was 84.5%. On univariate analysis, LC was negatively influenced by WHO grade (p = 0.001), GTV (p = 0.013), and male gender (p = 0.058).

CONCLUSIONS:
PT is a safe and effective treatment for patients with untreated, recurrent, or incompletely resected intracranial meningiomas. WHO grade and tumor volume was an adverse prognostic factor for local control.