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Single and hypofractionated stereotactic radiotherapy with CyberKnife for craniopharyngioma.

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Abstract

Craniopharyngiomas are slow-growing tumors found in the suprasellar region, with especially high incidence in Japanese children. Due to the location, proximity and adhesiveness of the tumor to adjacent critical structures, these tumors remain a significant clinical challenge. The purpose of this study was to evaluate the clinical outcome of single and hypofractionated stereotactic radiotherapy (SRT) with CyberKnife for craniopharyngioma. Forty-three patients (21 men and 22 women; median age 44 years; range 3-85 years) were treated at two institutions. Three cases were treated in a single fraction to a marginal dose of 13-16 Gy. The other 40 cases were treated in 2-5 fractions to a marginal dose of 13-25 Gy. Tumor volumes ranged from 0.09 to 20.8 cm(3) (median 2.0 cm(3)). Toxicities were evaluated with the Common Terminology Criteria for Adverse Events version 4.0. The median follow-up period was 40 months (range 12-92 months). The 3-year overall survival and local control rates were 100 and 85%, respectively. In-field cyst enlargement was observed in 9 patients. These tumors had significantly larger volumes (mean 6.9 cm(3); 95% confidence interval, CI, 2.8-10.9 cm(3)) than the 34 controlled tumors (2.9 cm(3); CI 1.5-4.3 cm(3)) (P = 0.02). Out-field tumor regrowth was observed in 4 patients. No radiation-induced symptomatic visual disorder or brain necrosis was observed. Hypopituitarism was observed in only 1 patient. Single and hypofractionated SRT using CyberKnife produced high tumor control rates with minimal complications. Hypofractionated SRT may be useful for protecting the visual nerve and neuroendocrine function, especially for tumors located near the optic pathways and for large tumors.

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