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Risk factors for post-treatment edema in patients treated with stereotactic radiosurgery for meningiomas.

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Abstract

BACKGROUND: Peritumoral edema is a recognized complication following stereotactic radiosurgery (SRS).**OBJECTIVE:** To evaluate the risk of post-treatment peritumoral edema following SRS for intracranial meningiomas and determine predictive factors.**METHODS:** Between 2002 and 2008, 173evaluable patients underwent CyberKnife or Gamma Knife SRS for meningiomas. Eighty-four patients (49%) had prior surgical resections, 13 patients had WHO grade II (atypical) meningiomas, and 117 patients had a neurologic deficit prior to SRS. Sixty-two tumors were in parasagittal, parafalcine, and convexity locations. The median tumor volume was 4.7 mL (range, 0.1 - 231.8 mL). The median prescribed dose and median prescribed biologically equivalent dose (BED) were 15 Gy (range, 9 - 40 Gy) and 67 Gy (range, 14 - 116 Gy), respectively. Ninety-seven patients were treated with single fraction SRS, 74 received 2 to 5 fractions, and 2 got> 5 fractions.**RESULTS:** The median follow-up was 21.0 months. Thirteen patients (8%) developed symptomatic peritumoral edema, with a median onset time of 4.5 months (range, 0.2 - 9.5 months). The 3-, 6-, 12-, and 24-month actuarial symptomatic edema rates were 2.9%, 4.9%, 7.7%, and 8.5%, respectively. The crude tumor control rate was 94%. On univariate analysis, large tumor volume ($p = 0.01$) and single fraction SRS ($p = 0.04$) were predictive for development of post-treatment edema.**CONCLUSION:** SRS meningioma treatment demonstrated a low incidence of toxicity; however, large tumor volumes and single fraction SRS treatment had an increased risk for post-treatment edema. Risk factors for edema should be considered in meningiomas treatment.

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