Gamma-knife radiosurgery in the treatment of cavernous sinus meningiomas

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**Purpose:** To evaluate clinical outcome and tumor control rate after gamma knife radiosurgery (GKRS) of cavernous sinus meningiomas.

**Method:** Between 1998 and 2001, GKRS was performed at our institution in 65 patients harboring meningiomas involving the cavernous sinus. Two patients were lost to follow-up review, leaving 63 patients for analysis. In sixteen cases (25%) with a tumor volume of \( \leq 15 \text{ cm}^3 \) GKRS was the primary treatment. Forty-seven patients (75%) underwent adjuvant radiosurgery after one or more microsurgical interventions. The mean age was 53 years, the male to female ratio 13:50. A median dose of 13 Gy (range 12 – 15 Gy) was applied to the tumor margin. The optic system received less than 8 Gy in all cases.

**Results:** Presenting symptoms included mainly deficits of the II, III, V and VI cranial nerves in 24, 22, 22 and 20 patients, respectively. At follow-up examination (6 – 51 months, mean 25) neurological status was improved in 17 patients (27%) and stable in 46 (73%). Mild transient symptoms such as trigeminal dysesthesia were reported in four cases (6%). However, neither permanent aggravation of existing neurological deficits nor new deficits were observed at follow-up. Tumor volumes as measured in MRI (1.4 – 18.1 cm\(^3\), mean 7.4) decreased in 23 (38%) and remained unchanged in 38 (62%) of 61 patients with available post-interventional imaging at 5 to 49 months (mean 22).

**Conclusions:** GKRS provided safe and effective management of cavernous sinus meningiomas. GKRS as primary treatment can be considered as an alternative to watchful waiting or to a microsurgical removal (with questionable results) of small (\( \leq 15 \text{ cm}^3 \)) cavernous sinus meningiomas. In case of extensive meningioma it should be proposed as an adjuvant to surgery.