True petroclival meningiomas: results of surgical management.
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Abstract
Object The relentless natural progression of petroclival meningiomas mandates their treatment. The management of these tumors, however, is challenging. Among the issues debated are goals of treatment, outcomes, and quality of life, appropriate extent of surgical removal, the role of skull base approaches, and the efficacy of combined decompressive surgery and radiosurgery. The authors report on the outcome in a series of patients treated with the goal of total removal.

Methods The authors conducted a retrospective analysis of 64 cases of petroclival meningiomas operated on by the senior author (O.A.) from 1988 to 2012, strictly defined as those originating medial to the fifth cranial nerve on the upper two-thirds of the clivus. The patients' average age was 49 years; the average tumor size (maximum diameter) was 35.48 ± 10.09 mm (with 59 tumors > 20 mm), and cavernous sinus extension was present in 39 patients. The mean duration of follow-up was 71.57 months (range 4-276 months).

Results In 42 patients, the operative reports allowed the grading of resection. Grade I resection (tumor, dura, and bone) was achieved in 17 patients (40.4%); there was no recurrence in this group (p = 0.0045). Grade II (tumor, dura) was achieved in 15 patients (36%). There was a statistically significant difference in the rate of recurrence with respect to resection grade (Grades I and II vs other grades, p = 0.0052). In all patients, tumor removal was classified based on postoperative contrast-enhanced MRI, and gross-total resection (GTR) was considered to be achieved if there was no enhancement present; on this basis, GTR was achieved in 41 (64%) of 64 patients, with a significantly lower recurrence rate in these patients than in the group with residual enhancement (p = 0.00348). One patient died from pulmonary embolism after discharge. The mean Karnofsky Performance Status (KPS) score was 85.31 preoperatively (median 90) and improved on follow-up to 88, with 30 patients (47%) having an improved KPS score on follow-up. Three patients suffered a permanent deficit that significantly affected their KPS. Cerebrospinal fluid leak occurred in 8 patients (12.5%), with 2 of them requiring exploration. Eighty-nine percent of the patients had cranial nerve deficits on presentation; of the 54 patients with more than 2 months of follow-up, 21 (32.8%) had persisting cranial nerve deficits. The overall odds of permanent cranial nerve deficit of treated petroclival meningioma was 6.2%. There was no difference with respect to immediate postoperative cranial nerve deficit in patients who had GTR compared with those who had subtotal resection.

Conclusions Total removal (Grade I or II resection) of petroclival meningiomas is achievable in 76.4% of cases and is facilitated by the use of skull base approaches, with good outcome and functional status. In cases in which circumstances prevent total removal, residual tumors can be followed until progression is evident, at which point further intervention can be planned.

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