Cranial base surgery. Results in 183 patients*

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Key words: cranial base surgery

Abstract

Objective – To learn about the effects of cranial base surgery.

Design – Cohort study with a mean follow-up of 30 months.

Setting – Population-based.

Patients – A consecutive sample of 183 patients who underwent cranial base surgery; 118 patients had malignant skull base tumors, majority were previously treated; 50 had benign tumors, 9 patients had congenital malformations of the skull base; 3 patients had inflammatory lesions, and 3 had traumatic defects of the skull base.

Main outcome measures – Disease-free interval and overall survival as well as rate of complications and functional status

Intervention – Cranial base surgery was followed by radiotherapy (in previously untreated patients).

Results – After completion of follow-up (30 months, mean), 30 (25.4%) patients had died of their malignant tumors and 8 (6.8%) had died of other causes. One patient (0.84%) was lost to follow-up. The overall cancer survival without regard to histologic type was 67% (63% with no evidence of disease). Among the patients who were treated for benign neoplasm 72% were NED at a mean 39 months of follow-up. The group of patients with congenital malformations, inflammatory, and traumatic lesions demonstrated successful correction of their pre-surgical problem with skull base surgery. One patient (invasive aspergillosis) died of...
disease. The overall surgical/medical mortality was 2%, complication rate was 33% and Karnofsky performance scale was improved or unchanged postoperatively in 83% of patients. The average duration of surgery, number of blood transfusions used and the length of the hospital stay was 10 hours, 3 units, and 15 days respectively.

**Conclusions** – Cranial base surgery is a valid surgical technique for cranial base afflictions. In this study it was found to be beneficial in controlling benign as well as malignant disease and be the treatment of choice in selected congenital malformations, trauma, and inflammatory lesions.

**Introduction**

The validity of technical advances in cranial base surgery has to be based on clinical results. The length of surgery, duration of hospitalization, surgical complications as well as the ultimate functional and oncologic outcome, provide some measure of usefulness of cranial base surgery.

In this paper we will describe our experience with 183 patients who underwent cranial base surgery, primarily for oncologic reasons.

**Material and methods**

In the preoperative evaluation, all patients were scanned with CT and/or MR. 104 patients underwent a carotid angiogram, 93 of them also had temporary balloon occlusion and xenon blood flow studies, 18 had tumor embolization.

Full spectrum of cranial base procedures was utilized for treatment of these patients from January 1987 to December 1991 [1–7]. Broadly, these approaches could be divided into anterior-midline (n = 20), anterolateral (n = 35), facial translocation (n = 40), lateral cranial base (n = 49) and combined approaches (n = 39). These procedures were selected on the basis of which one was judged to be the best suited for a specific tumor. As our experience evolved and advantages of various procedures became more evident, some were used preferentially. For example, more facial translocation was utilized in the second half of the study period than a preauricular-infratemporal fossa approach. All surgical procedures were performed by one head and neck surgeon jointly with several neurosurgeons and one plastic surgeon.

Most patients were reconstructed with their regional tissue (primarily temporalis muscle). In 21 patients microvascular free flap was utilized (rectus abdominis in 16 cases and latissimus dorsi muscle in 5 patients). Thirty-five patients had cranial bone grafting performed.

Among the 183 patients there were 156 adults and 27 children. The male/female ratio was 87/69 for adults and 17/10 for the pediatric patients. The average age for adults was 50.2 years and 10.8 years for children.

Oncologic indications for cranial base surgery predominated among our patients (91.8%). Among them 64.5% had malignant and 27.3% had benign

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<th>Table 2. Etiology of cranial base afflictions in 183 patients (percentages)</th>
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<tr>
<th>Indications: Tumors, Trauma, Infection, Cong. Malformations</th>
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<tbody>
<tr>
<td>Malformations 5%</td>
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<tr>
<td>Trauma 1% / Infection 1%</td>
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<td>Benign 27%</td>
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<td>Malignant 64%</td>
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(PJ et al.)