Osteoblastoma of the nasal cavity invading the anterior skull base in a young child

Case report

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Osteoblastoma, a rare benign tumor of the bone, usually occurs in the vertebrae and in long tubular bones. Its occurrence in the craniofacial region is extremely rare, especially so in the nasal and para-nasal area. We report a case in which such a tumor originated in the nasal cavity and extended to the ethmoid sinus, the left orbit, the maxilla, and the anterior cranial base.

Case Report

This 3-year-old girl presented with bulging of the nose on the left side (Fig. 1) but had no other clinical manifestations.

Examination. Careful physical examination showed fullness, convexity, and lateral displacement of the left nasal bone, as well as an erythematous left internasal mass arising from the anterior aspect of the middle turbinate. A biopsy specimen was obtained in the nasal cavity. The result was interpreted as an osteoblastic tumor suggestive of osteoblastoma. Plain x-ray films showed the absence of a nidus and

Fig. 1. Preoperative photograph of the patient showing a slight swelling around the nasal root.
expansion of the nasal bone and the left medial orbital wall (Fig. 2 left). Computerized tomography (CT) scanning showed a large, soft bony mass in the left nasal cavity, the left anterior ethmoid sinus, and the medial wall of the left orbit (Fig. 2 center). Magnetic resonance (MR) imaging revealed a signal void on T1- and T2-weighted images. The tumor appeared to extend to the maxilla and the anterior cranial base but did not invade the dura (Fig. 2 right). A 99mTc-scintigram demonstrated a hot area. Left external carotid injection angiography showed that the tumor was primarily fed by the left sphenopalatine artery with a lesser contribution by the left ethmoid artery (Fig. 3). This finding strongly suggested that the tumor originated in the nasal cavity and not in the ethmoid sinus.

Operation. During surgery, the tumor was exposed by using a “dismasking flap” method (Fig. 4 left). The tumor

Fig. 2. Left: Preoperative roentgenogram, Waters’ view, showing the absence of a nidus. Center: Preoperative CT scan. Right: Preoperative MR image revealing a signal void, which appeared on both T1- and T2-weighted images.

Fig. 3. Left external carotid injection angiograms, lateral (left) and anterior (right), showing staining of the tumor (open arrows), which is fed mainly by the left sphenopalatine artery (thin arrows). The left ethmoid artery (thick arrows) provides a lesser contribution to the tumor.

Fig. 4. Intraoperative photographs. Left: Osteoblastoma exposed by the dismasking flap. The margin of the tumor is not seen on direct visual inspection. Center: The site after en bloc resection of the osteoblastoma. Right: Reconstruction using calvarial bone grafts with microplates and screw fixation.
was poorly defined on direct visual inspection, and it was necessary to use the neuroimaging studies as a guide to resect the tumor completely (Fig. 4 center). The tumor looked like sorbet surrounding a shell. The bone defects of the nose and the orbit were reconstructed with split calvarial bone grafts (Fig. 4 right). The defect of the lateral cribriform plate was covered with a pericranial graft but no bone grafts.

Pathological Findings. Pathological examination revealed that the lesion was composed of interconnecting osteoid islands and highly vascularized stroma and that the osteoid tissue was rimmed by osteoblasts exhibiting no significant nuclear atypia or mitotic activity (Fig. 5).

Postoperative Course. Imaging studies (CT scans and plain x-ray films) obtained 8 months postoperatively showed no evidence of the tumor (Fig. 6). No facial deformities or scars are presently visible (Fig. 7).

Discussion

The benign osteoblastoma is an uncommon bone tumor, representing only 3% of all benign tumors of the bone; the intranasal osteoblastoma is very rare. Osteoblastomas usually occur in patients younger than 30 years of age with a peak incidence in the second decade of life and a range of 3 to 78 years. Only five cases of benign osteoblastoma with nasal cavity involvement have been reported in the literature. The present case is the sixth case, and it involves the youngest patient. In all six cases the tumors were greater than 2.5 cm in size. Intracranial extension was seen in two cases. The other five cases reported were treated with local excision; one case with intracranial extension showed local recurrence. It has been reported that a benign osteoblastoma of the skull developed into an osteosarcoma, and the risk of this occurring seems higher after inadequate initial treatment.

Although the margin of the tumor in our case was well defined on radiological images, it was difficult to determine the exact margin during the operation. Therefore, it is important to show how to excise the tumor completely under direct vision.
The dismasking flap was reported in 1993. This flap is a cranioorbitofacial degloving method that uses circumpalpebral with or without piriform margin incisions and presents a wide surgical field under direct vision. This approach does not preclude the use of a galea–frontalis flap for the reconstruction of the anterior cranial base as long as the flap is elevated before sectioning the supraorbital neurovascular bundle.

To date, one case of spontaneous malignant transformation and one case of an aggressive type of tumor have been reported. Therefore, it is important that benign osteoblastomas be completely removed under direct vision. Using the dismasking flap method in the present case, it was possible to resect the benign osteoblastoma completely from the nasal cavity, even though it extended into the orbit, the maxilla, and the anterior cranial base.

References

Manuscript received February 10, 1997. Accepted in final form May 19, 1997.

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