Surgical removal of orbital osteoma

Case report

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The authors report a patient with a large orbital osteoma causing marked physical deformity and diplopia but with preservation of visual acuity. A combined trans-orbital and transcranial operative approach was used for total tumor removal and cosmetic repair.

Key Words • orbital osteoma • diplopia • deformity

OSTEOMAS that result in extensive displacement of the orbital contents are infrequent. The large size of this tumor, its unusual presentation, technique of surgical excision, and reconstruction of the orbit prompted reporting of this case.

Case Report

This 56-year-old man was admitted to the West Haven Veterans’ Administration Hospital, neurosurgical service, in November, 1972. Four years prior to admission he noted a nontender progressive protuberance of his right eye; this increasing ocular deformity had caused diplopia for 3 years. He had no other symptoms, and denied pain, symptoms of sinus infection, or change in visual acuity.

Examination. Physical examination demonstrated a 14-mm nonpulsatile proptosis of the right eye with a 22-mm inferior displacement (Fig. 1 left). There was mild conjunctival chemosis and funduscopic examination revealed no papilledema or evidence of optic atrophy in either eye. Visual acuity was 20/20 and visual fields were intact bilaterally. The pupils were equal, reacting briskly to light and accommodation, and extraocular motion was intact. A firm, nontender mass was palpable in the superior and medial portion of the orbital fossa, and the supraorbital ridge was prominent. No bruit was audible and the remaining physical and neurological examination was normal.

X-ray films of the skull disclosed a large bone mass in the right orbit with extensive involvement of the orbital roof (Fig. 2). Tomograms showed that the osteoma was incorporated in the right ethmoid and frontal sinuses in addition to the orbit. Brain scan and electroencephalogram were interpreted as normal.

Operation. The intraorbital portion of the bone growth was exposed through a modified Lynch incision just below the right eyebrow. The anterior ethmoidal bundle, including the anterior ethmoidal artery, vein, and nerve, was ligated and divided, and the orbital periosteum overlying the tumor, including the trochlea, was mobilized, with careful preservation of Tenon’s capsule. After cauteri-
FIG. 1. Left: Preoperative photograph showing the inferior and lateral displacement of the right globe. Right: Photograph 2 years after surgery illustrating return of conjugate gaze and the cosmetic result.

zation of the posterior ethmoidal neurovascular bundle, the entire intraorbital contents were dissected free from the tumor, which was pear-shaped, and ivory in appearance. Further transcranial exposure revealed that the tumor involved the suprarobital ridge and the entire orbital roof from the ethmoid and frontal sinuses medially to the zygoma laterally, and extended posteriorly to involve the medial portion of the sphenoid wing. No pedicle of mucoperiosteum could be identified to determine the exact site of origin. The tumor was resected piecemeal, along with lateral right ethmoid and frontal sinuses, a portion of the sphenoid wing, the entire orbital roof, and supraorbital ridge. The orbital roof and ridge were reconstructed with acrylic plastic embedded with wire mesh. Pathological examination of the specimen revealed osteoma of the compact type without organized Haversian canals.

Postoperative Course. At follow-up examination 2 years after surgery the patient had a good cosmetic appearance (Fig. 1 right). He had no diplopia, conjugate gaze was full, and there was no evidence of chemosis.

Discussion

Osteomas arising from the paranasal sinuses with secondary invasion of the orbit are relatively uncommon with an incidence of 0.4% to 5% of all orbital tumors. The most frequent sites of origin are the frontal, ethmoid, maxillary, and sphenoid sinuses, respectively. Initially, the osteoma takes the form of the paranasal sinus in which it originates and with increasing size invades adjacent orbital, nasal, and intracranial cavities. Frequently a pedicle of mucoperiosteum connects the osteoma to the parent sinus. The histological type of bone formation is either compact (eburneous), cancellous, or a mixture of the two. The most common symptom of paranasal osteomas is pain, while deformity is the most common sign. The usual visual disturbance is diplopia and a decrease in visual acuity may occur with larger tumors. Chemosis and sinus infection with chronic nasal discharge are other symptoms. Intracranial complications associated with these tumors include pneumatocele, mucocele, abscess formation, meningitis, and cerebrospinal fluid rhinorrhea. Despite the
large size of the osteoma in this patient, visual acuity was not impaired nor was pain a presenting symptom.

Asymptomatic osteomas located within sinuses without intracranial or intraorbital encroachment should be followed without operative intervention, with interval roentgenographs obtained to determine change in size. The majority of osteomas are evaluated by ophthalmologists or otolaryngologists; when symptomatic with the tumor limited to the sinuses or orbit without intracranial cavity encroachment, they are best excised either transorbitally or by direct sinus approach. When the osteoma involves the intracranial bone structures, usually the roof of the orbit, total removal can be accomplished by frontal craniotomy. This approach provides wide exposure of the orbit and anterior fossae, inspection of intracranial contents, decompression of the orbital cavity, and repair of the dura if necessary.

The combined transorbital-frontal approach offers several advantages. The initial transorbital exposure provides for mobilization of the trochlea, and facilitates resection of periorbital fascia from adjacent bone structures, which leaves Tenon’s capsule intact. Ligation of the anterior and posterior ethmoid arteries early in the procedure results in substantially decreasing intraoperative blood loss. Total excision requires a more extensive exposure by frontal craniotomy with the initial orbital entry facilitating this procedure. Following excision of the osteoma, the supraorbital ridge and orbital roof reconstruction are undertaken for cosmetic repair and to protect the globe against intracranial pulsations.

References


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