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Case Report

Orbital Ivory Osteoma Originating from the Ethmoid Sinus

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Keywords

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- Imaging-based navigation
- Orbital osteoma
- Orbitotomy
- Proptosis

Abstract

Background: Osteomas are benign, slow growing tumors with the potential to generate a variety of sinus, orbital, and ocular symptoms due to their space-occupying nature and often insidious presentation. Though a less common cause of pathology, they are still encountered in clinical practice.

Case Report: The authors present a case report of an adolescent male with proptosis and diplopia secondary to sinus osteoma with significant intraorbital extension.

Discussion: The presentation, diagnosis, and surgical management of orbital osteoma are provided with associated review of literature.

Conclusion: Orbital osteoma should be included on the differential for sinus and orbital masses, and management may benefit from a multidisciplinary approach.

ABBREVIATIONS

CT: Computed Tomography; CUSA: Cavitron Ultrasonic Surgical Aspirator

INTRODUCTION

Orbital osteomas are benign, slow growing bony lesions, typically originating from the adjacent frontal or ethmoid sinuses [1]. Median age of presentation is 37 years, and M: F ratio is reported at 1.6-1.8:1 [2]. Isolated osteomas are most commonly incidental findings and of little clinical significance, though by size or proximity to other orbital structures they can produce symptoms, as detailed in the following case report. This case report has been compliant with the Health Insurance Portability and Accountability Act and adheres to the principles of the Declaration of Helsinki.

CASE PRESENTATION

A 14 year old boy was referred for evaluation of persistent left eye proptosis associated with eight months of intermittent double vision. Upon presentation to our clinic, visual acuity was 20/15 in the right eye and 20/20 in the left with no pupillary abnormality. Patient demonstrated a left exotropia and hypotropia in primary gaze, with limitation of left eye movement in all directions of gaze, particularly supraduction (Figure 1). External exam revealed left eye proptosis and hypoglobus, globe resistance to retropulsion, and lateral and inferior orbital fullness. CT imaging of orbits revealed radio dense left orbital mass originating from the ethmoid sinus and extending through the orbital roof (Figure 2).

The patient was taken to the operating room for mass resection as combined case with otolaryngology and ophthalmology. Initially, the lesion was liberated from the medial orbital wall via an endonasal approach using amicrodebrider and 2mm diamond burr neurosurgical irrigating drill. Using a superior lid crease incision approach, the mass was then separated from the orbit by debridement with the same neurosurgical drill and cavitron ultrasonic surgical aspirator (CUSA). Resection was facilitated

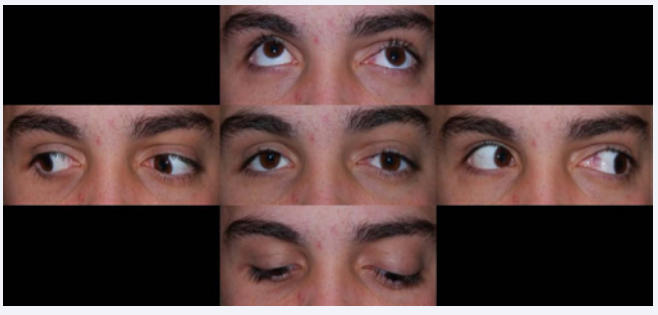

Figure 1 Pre-operative motility with left eye exotropia and hypotropia in primary gaze. Note limitation of left eye motility in all directions of gaze, particularly supraduction.

by endonasal and intraorbital use of a commercial imaging-guided navigation system. This combined method provided the anatomic information and surgical precision needed to resect the mass without violation of dura underlying the lesion and without disruption of the superior oblique/trochlea complex. The 2.4 x 2.4 x 2.2 cm resected mass was identified at final pathology as an ivory osteoma (Figure 3). Following the procedure, proptosis resolved and patient recovered full range of eye movements after three months without loss of visual acuity; he maintains a stable exam one year post operation.

DISCUSSION

Osteoma represents a benign, bosselated mass arising from the subperiosteal surface of cortical bone. Based on pathologic examination, osteomas are categorized as ivory, mature, or mixed depending on their relative amounts of lamellar bone and fibrous stroma. A subgroup of sinus osteomas demonstrates osteoblastoma-like features on

Microscopic exam and undergoes extension into neighboring structures, such as the orbit, at a higher frequency than other osteoma varieties [2]. Most osteomas occur in isolation, though growth of multiple lesions may be seen in Gardner syndrome, characterized by multiple colorectal polyps and other various tumors with an almost 100% risk of colon carcinoma in the 4th to 6th decades [3].

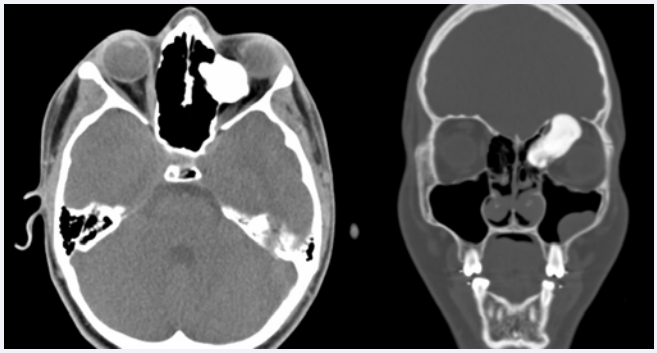

Figure 2 Maxillofacial CT without contrast, axial and coronal cuts, demonstrating uniform, bony mass originating from ethmoid sinus and extending through super medial left orbit.

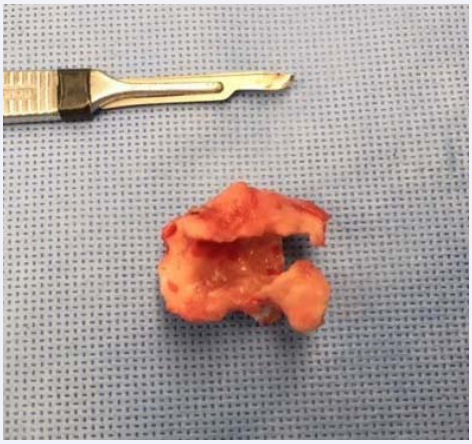

Figure 3 Ivory osteoma immediately following extensive debridement and surgical resection, with #15 blades for scale.

When symptomatic, osteomas present with findings corresponding to the space occupied by the lesion. Common complaints include visual changes (36% of patients), recurrent headache (51%) and facial pain (24%) [2]. Involvement of the sinuses may generate persistent sinusitis, and cases of seizure from extension into the cranial vault have been reported [4]. Proptosis, globe displacement, limited eye motility, and strabismus may all be seen on clinical exam. Diagnosis and surgical planning are aided by orbital and maxillofacial CT imaging, which confirms the finding of a characteristically radiodense, sclerotic, and well circumscribed mass [2]. CT imaging can differentiate osteomas from soft tissue masses, as well as the more aggressive osteosarcoma (characteristic "sunburst" appearance), osteoblastoma (sclerotic rim with cystic center), and fibrous dysplasia (homogenous bone with irregular, poorly defined margins) [5]. The gold standard for diagnosis remains pathology-examined tissue specimen, obtained by biopsy.

Management of orbital osteoma consists of observation in asymptomatic patients [6]. Patients with symptoms or cosmetic concerns may undergo surgical excision of the mass. Surgical approaches vary but can be grouped into transorbital and endonasal approaches; the methods are not mutually exclusive and combined procedures using both techniques can be used as in the case above. Transorbital approaches are typically directed either superiorly with superior lid crease or coronal incisions, or medially with transcaruncular or Lynch incision. Endonasal approach is usually facilitated with endoscopic imaging, and can benefit from imaging-guided navigation if available [4,7]. The tumor is separated away from adjacent sinus bone and may require both dissection away from adjacent orbital structure and reduction in size prior to final removal. Large bony defects may be bridged with polyethylene, titanium, or other appropriate graft material. Reported complications of resection include iatrogenic superior oblique palsy, deep superior sulcus, recurrent sinusitis, loss of frontal sinus anterior table, anosmia, and CSF leak [4,7]. Recurrence is unusual but has been reported at rates as high as 20%, often at sites of incomplete excision [4,6].

In conclusion, this case highlights the presentation and management of an ethmoid sinus osteoma with significant intraorbital extension. Leveraging a combined transorbital/endonasal surgical approach and through the use of both imaging-guided navigation and CUSA debridement, a return to baseline function without surgical complication was achieved. The clinician should include osteoma among the differential for orbital and sinus masses and remain aware that sinus-based disease processes may present with orbital and ocular complaints and findings. In complex surgical cases involving both the sinuses and the orbit, a combined surgical approach with both otolaryngology and oculoplastics should be considered when available.

REFERENCES

1. Eller R, Sillers M. Common fibro-osseous lesions of the paranasal sinuses. Otolaryngol Clin North Am. 2006; 39: 585-600.

2. McHugh JB, Mukherji SK, Lucas DR. Sino-orbital osteoma: a clinic

opathologic study of 45 surgically treated cases with emphasis on tumors with osteoblastoma-like features. Arch Pathol Lab Med. 2009; 133: 1587-1593.

3. Bilkay U, Erdem O, Ozek C, Helvaci E, Kilic K, Ertan Y, et al. Benign osteoma with Gardner syndrome: review of the literature and report of a case. J Craniofac Surg. 2004; 15: 506-509.

4. Wei LA, Ramey NA, Durairaj VD, Ramakrishnan VR, Cruz AV, Dolman PJ, et al. Orbital osteoma: clinical features and management options. Ophthal Plast Reconstr Surg. 2014; 30: 168-174.

5. Mansour AM, Salti H, Uwaydat S, Dakroub R, Bashshour Z. Ethmoid sinus osteoma presenting as epiphora and orbital cellulitis: case report and literature review. Surv Ophthalmol. 1999; 43: 413-426.

6. Turri-Zanoni M, Dallan I, Terranova P, Battaglia P, Karligkiotis A, Bignami M, et al. Frontoethmoidal and intraorbital osteomas: exploring the limits of the endoscopic approach. Arch Otolaryngol Head Neck Surg. 2012; 138: 498-504.

7. Wang Y, Li D, Jiang A, Zhang H, Sun Y, Liu Z, et al. Endoscopic Resection of Giant Ethmoid Osteomas with the Assistance of an Image-guidance System. Anticancer Res. 2016; 36: 1325-1330.

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