



A Large Frontal Sinus Osteoma Presenting as Proptosis of the Eyeball

KEYWORDS

Osteoma, frontal sinus, Proptosis with Osteoma

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ABSTRACT Osteoma is the most common benign tumor of the paranasal sinuses that is capable of extending to surrounding structures. We describe a patient with osteoma of the frontal sinus who presented with left proptosis.

INTRODUCTION:

Osteoma is the most common benign tumor of the nose and paranasal sinuses, and the frontal sinus is its more frequent location^{1,2}. Paranasal sinus osteoma is a slow growing, encapsulated bony tumor that may be commonly asymptomatic, being detected incidentally in 1% of plain sinus radiographs or in 3% of sinus computerized tomographic scans³. Osteomas are a frequent cause of mucoceles and sinusitis due to blockage of the nasal ducts, but they can also present with more dramatic signs, such as orbital or intracranial invasion^{4,5}. If larger and invading the orbit, they result in proptosis and/or globe displacement and ocular motility problems^{3,5}.

We describe a patient with osteoma of the frontal sinus who presented with left proptosis. To the best of our knowledge, this is the rare case which has been presented osteoma associated with proptosis of the eyeball.

CASE:

A 60 year-old man presented with left eye lid edema and periorbital swelling. At physical examination, inferior lateral displacement of the left eye ball and proptosis were detected.

Fundoscopic examination revealed no papilledema or evidence of optic atrophy

Anteroposterior x-ray of the skull showed a large, dense, mushroom shaped mass projecting into the left orbit from the orbital roof (Figure 1).



Fig-1: X-ray Skull, AP View: Osteoma of Left Frontal Sinus

Lateral x-ray of the skull showed increasing density in the frontal and orbital regions. (Figure-2)

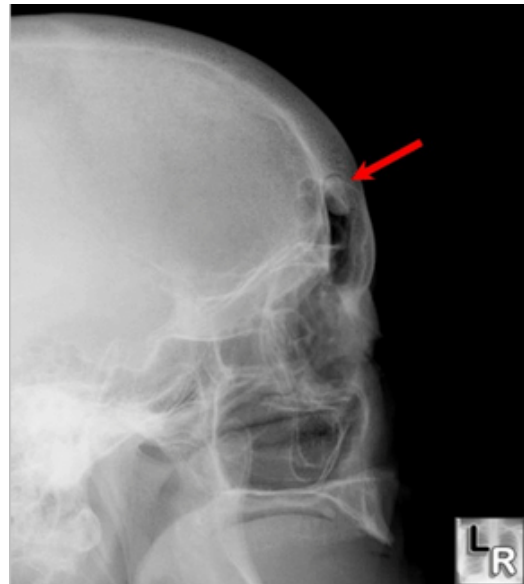


Fig-2: X-ray Skull, Lateral View: Osteoma of Left Frontal Sinus

Axial and coronal computed tomography images revealed a 3.5x3x4 cm well-defined, multilobulated high density tumor, originated from the superior wall of the frontal sinus and involving the majority of the anterior superior left orbital region. Extension into the orbit with narrow neck was noted. The mass had displaced the left superior rectus muscle and bulbus oculi inferiorly.

On the basis of the x-ray and CT findings, the diagnosis of a large osteoma of the frontal sinus was made.

DISCUSSION:

Symptoms referable to frontal sinus osteomas are variable and usually proportional to the size of the tumor. Many small osteomas are asymptomatic². A progressively enlarging osteoma can, although rarely, outgrow the sinus walls causing forehead deformity, intraorbital or intracranial complications⁷.

The etiology of osteomas is controversial. The most accepted theories are embryologic, traumatic or infectious causes^{2,5}. In favor of the developmental theory is the fact that many osteomas appear to rise at the junction of the ethmoid and

frontal sinuses, a location where membranous and cartilaginous tissues meet during embryonic life³. Trauma during puberty, when bone development is at its maximum, has been implicated in several cases of osteoma³.

Sinusitis may stimulate osteoblastic proliferation within the mucoperiosteal lining of sinuses that cause tumor formation^{3,8}. Despite the coexistence of sinusitis with osteoma, some authors believe that the sinusitis results from occlusion of sinus openings by the osteoma³.

The occurrence of osteomas in the setting of Gardner's Syndrome (associated with soft tissue tumors and high-risk intestinal polyps) must be kept in mind⁷. Osteomas generally become symptomatic in the second to fifth decades of life⁸. The ratio of males to females about 2 to 1². The greater preponderance of sinus osteomas in man is attributed to man's greater exposure to trauma and the larger size of their sinuses³. Clinical onset is most often characterized by facial pain and headache, while a predominantly intraorbital growth leads to proptosis, diplopia and amaurosis fugax⁷. On the other hand, some intracranial complications may occur as a result of extensive destruction of the anterior cranial fossa; they include pneumatocele, mucocele, abscess formation, meningitis and cerebrospinal fluid rhinorrhea⁹.

Since its first use in the diagnosis of osteomas in 1899, radiography has become the method of choice for diagnosis of osseous lesions³. Osteomas are easily demonstrated by plain radiographs, CT or magnetic resonance imaging (MRI) as localized, isolated, markedly radiodense lesions resting on the floor of the sinus and expanding the involved sinus with or without orbital or intracranial extension³.

These findings usually consent to differentiate osteomas from other bone tumors, and from fibrous dysplasia⁹. Spiral CT helps to give a three-dimensional reconstruction of the tumor³. MRI is important in the definition of dural or soft tissue involvement. The orbital extensions are well defined in the coronal and sagittal images; which provide a good evaluation of the roof of the orbit. The relationship of the tumor with the optic canal and optic nerve is well shown in axial sec-

tions⁹. Radionuclide bone scan can help to differentiate an actively growing lesion ("hot") from a stable lesion ("cold"). Orbital venography has been used to demonstrate compression of the superior ophthalmic vein^{1,3}.

No treatment recommended for asymptomatic osteomas, especially in elderly patients. They can be followed radiographically^{5,8,10}. If significant growth or clinical sign is shown, a more aggressive posture could be used¹⁰. The type of procedure selected depends on the location and extent of the osteomas and the nature of any existing complications¹¹.

In the orbital region, anterior lesions can be removed via an anterior orbitotomy, while more posterior tumors require an orbitocranial procedure⁵

Fibrous dysplasia has been described in three forms: monostotic, polyostotic, and McCune-Albright syndrome⁵. In the skull, a grossly expansile, sclerotic lesions are seen.

Lesions do not really need to be diagnosed by biopsy, as the appearances are usually characteristic⁶. Localized thickening of calvarium with expansile sclerotic lesion was also seen in our case. The majority of cases with orbital involvement have monostotic fibrous dysplasia, with the frontal bone followed by the sphenoid and ethmoid being most commonly affected⁵. In our case, frontal and sphenoid bones were affected. The disease has a roughly equal sex distribution⁵. The age of onset is usually between 10 and 30, but can present late in adult life^{5,6}.

Prognosis is worse when the lesions occur early in life⁶. Cranial nerve palsies, raised intracranial pressure, and nasolacrimal duct and nasal obstruction can also occur⁵

In conclusion, frontal sinus osteomas can cause proptosis with orbital extension. It must be kept in mind for differential diagnosis of proptosis. Osteoma associated with fibrous dysplasia have not been described previously. Both of them has unknown etiology and originated from benign proliferation of bony tissue. The coincidence in our case can be explained by similar etiologies.

REFERENCE

1. Miller NR, Gray J, Snip R. Giant, mushroom-shaped osteoma of the orbit originating from the maxillary sinus. *Am J Ophthalmol* 1977; 83:587-91 | 2. Sandry F, Hessler C, Garcia J. The potential aggressiveness of sinus osteomas. A report of two cases. *Skeletal Radiol* 1988;17:427-30 | 3. 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; 43:413-26 | 4. Smith ME, Calcatera TC. Frontal sinus osteoma. *Ann Otol Rhinol Laryngol* 1989; 98:896-900 | 5. Selva D, White VA, O'Connell JX, Rootman J. Primary bone tumors of the orbit. *Surv Ophthalmol* 2004; 49:328-42 | 6. Renton P. Congenital skeletal anomalies; skeletal dysplasias; chromosomal disorders. *Textbook of Radiology and Imaging* (Ed. D Sutton) Churchill Livingstone, New York 1998, pp:19-21 Frontal sinus osteoma associated with fibrous dysplasia 77 | 7. Brunori A, de Santis S, Bruni P, Delitala A, Giuffre R, Chiappetta F. Life threatening intracranial complications of frontal sinus osteomas: report of two cases. *Acta Neurochir (Wien)* 1996; 138:1426-30 | 8. Schwartz MS, Crockett DM. Management of a large frontoethmoid osteoma with sinus cranialization and cranial bone graft reconstruction. *Int J Pediatr Otorhinolaryngol* 1990; 20:63-72 | 9. Maiuri F, Iaconetta G, Giamundo A, Stella L, Lamaida E. Fronto-ethmoidal and orbital osteomas with intracranial extension. Report of two cases. *J Neurosurg Sci* 1996; 40:65-70 | 10. Naraghi M, Kashfi A. Endonasal endoscopic resection of ethmoido-orbital osteoma compressing the optic nerve. *Am J Otolaryngol* 2003; 24:408-12 | 11. Lin CJ, Lin YS, Kang BH. Middle turbinate osteoma presenting with ipsilateral facial pain, epiphora, and nasal obstruction. *Otolaryng Head Neck* 2003; 128:282-4