

Giant ethmoid osteoma with orbital extension presenting with epiphora*

Ustun Osma¹, Mehmet Yaldiz², Muhammet Tekin¹, Ismail Topcu¹

¹ Department of Otorhinolaryngology, School of Medicine, Dicle University, Diyarbakir, Turkey

² Dicle University, School of Medicine, Department of Pathology, Diyarbakir, Turkey

SUMMARY

Paranasal sinus osteoma is a slow-growing, benign, encapsulated bony tumour that may be commonly asymptomatic, being detected incidentally in 1% of plain sinus radiographs or in 3% sinus computerized tomographic scans. In a patient presenting with epiphora and nasal obstruction, computed tomography disclosed a giant osteoma of the ethmoid. In this article, one patient having giant ethmoidal osteoma with orbital extension is described, and epidemiology, diagnosis, treatment, and pathological findings in paranasal sinus osteoma are reviewed.

Key words: ethmoid osteoma, paranasal sinus, neoplasms, giant, epiphora, orbital extension

INTRODUCTION

Osteomas are uncommon benign tumours, occasionally located in paranasal sinuses, of which the frontal sinus is the most frequent site followed by the ethmoid and maxillary sinuses (Smith and Calcaterra, 1989; Hehar and Jones, 1997). The prevalence of osteoma has been estimated to be 0.01-0.43 per cent. The aetiology of osteomas is still unknown but three possible theories have been proposed: embryological, traumatic and infective (Koivunen et al., 1997).

The most common symptoms of osteomas are facial pain and headache, but many osteomas are asymptomatic and are discovered accidentally on sinus radiography (Atallah and Jay, 1981; Spencer and Mitchell, 1987; Smith and Calcaterra, 1989; Gillman et al., 1997).

Osteomas may rarely involve the orbit, generally as a result of direct extension from the adjacent paranasal sinuses (Gillman et al., 1997).

We report on a case of fronto-ethmoido-orbital osteoma accompanied by orbital proptosis and epiphora. The presentation, diagnostic evaluation, and management of these uncommon tumours are discussed.

CASE REPORT

A 35-year-old man had symptoms of nasal congestion, nasal obstruction and epiphora. He had complaints for about one year. He had epiphora of about 3-4 weeks duration, which had been diagnosed by an ophthalmologist as a right nasolacrimal duct obstruction. Physical examination revealed no intranasal polyps. There was proptosis, and lateral displacement of the eyeball, and he had normal ocular motility. A firm, one cm



Figure 1. Preoperative CT of a paranasal sinus osteoma with orbital expansion. A: Axial CT scan showing displacement of the medial rectus muscle by osteoma. B: Coronal CT scan demonstrates a multilobulated, homogenous, very radiodense lesion occupying the ethmoid sinus.



Figure 2. Coronal CT scan three months after surgery.

mass palpated in the angle of the right orbit.

Computerized tomography (CT) of the paranasal sinus revealed a 3x2,5x3,5 cm, well-defined, markedly radiodense lesion arising from the right ethmoid sinus. The tumour extended upward to the medial and superior wall of the right orbital cavity and the lower part of the right frontal convexity. The mass had displaced the globe, the lamina papyracea, and the right medial rectus. Mucosal thickening was present in the all sinuses (Figures 1A and B).

All procedures were performed under general anesthesia. Initially, we performed a lateral rhinotomy approach. The removal of nasal sinus osteoma, because of their hardness and scope, required extensive drilling work. The osteoma had to be gradually minced, intranasally, as it was too large to pass through the piriformes aperture.

The osteoma was removed, and the defect in the medial and superior wall of the right orbita was covered with a iliac bone graft. Post-operative CT showed all of the osteoma to be removed (Figure 2). Histological examination confirmed that the lesion was an osteoma.

DISCUSSION

Osteomas are the commonest benign neoplasms of the nose and paranasal sinuses (Hehar and Jones, 1997). Osteogenic tumours, benign or malignant, are characterized by the formation of either mature bone or osteoid by the tumour cells. Osteomas are slow growing, benign, osteogenic tumours made up of mature bone (Gillman et al., 1997).

There is a male preponderance with a male to female ratio of 1.5-3:1 (Samy and Mostafa, 1971; Atallah and Jay, 1981; Menezes and Davidson, 1994; Mansour et al., 1999). The age of onset varies from 8 to 77 years with the highest incidence in the 4th to the 7th decades of life (Samy and Mostafa, 1971; Boysen, 1978; Atallah and Jay, 1981; Mansour et al., 1999). Of the paranasal sinuses the most commonly involved is the frontal sinus, followed by the ethmoid and maxillary sinuses. Osteomas within the sphenoid sinuses are distinctly rare (Atallah and Jay, 1981).

The gross appearance of an osteoma is a smooth, lobulated mass of bony consistency. Histopathological examination shows the tumour to be composed of compact or cancellous bone or both (Fu and Perzin, 1974).

Many of these tumours are found incidentally in patients without symptoms who undergo radiologic examinations for other reasons (Gillman et al., 1997; Hehar and Jones, 1997). Small osteomas are almost always asymptomatic (Hehar and Jones, 1997). Ethmoid osteomas tend to cause symptoms earlier than those in the frontal sinus (Menezes and Davidson, 1994). Symptoms, when present, relate to the space-occupying nature of the lesion, which may obstruct the sinus ostium or impinge on adjacent orbital or intracranial structures. Symptoms include headache, nasal obstruction, persistent sinusitis, pain, and facial asymmetry. Ocular symptoms may occur with orbital involvement, most commonly proptosis and diplopia (Gillman et al., 1997). The differential diagnosis of a solitary osteoma includes periosteal osteosarcoma, osteochondroma, periosteal osteoblastoma, ossified periosteal lipoma, and myositis ossificans (Greenspan, 1993). The diagnosis is most often made by plain radiographs or preferably CT of the sinus. The distinction can frequently be made by means of the examination of radiographs. An osteoma is typically a dense, sclerotic, homogeneous mass with well-defined margins. The mass is nonenhancing on CT scans and does not demonstrate any cortical invasion. In contrast, a malignant lesion generally is nonhomogeneous and is variably enhancing with irregular margins and evidence of lytic bone destruction (Weber, 1988; Hasso, 1989).

Management of uncomplicated sinus osteomas is controversial, since surgery involves serious potential risks (Namdar et al., 1998). Generally, conservative treatment is recommended for asymptomatic osteomas, especially in elderly subjects (Mansour et al., 1999). Most authors agree that surgical intervention is indicated only in the presence of symptoms (Menezes and Davidson, 1994). Surgical intervention is proposed if there is cosmetic deformity, frontonasal recess obstruction with evidence of sinus disease, displacement of the orbital contents, and mucocele formation (Hehar and Jones, 1997). Small asymptomatic osteomas can be managed conservatively with periodic imaging every 1 to 2 years to assess growth (Gillman et al., 1997).

Surgical removal is the choice of treatment of symptomatic osteomas (Gillman et al., 1997). When surgery is performed, these tumours can be successfully managed via endoscopic, open, or combined techniques (Namdar et al., 1998). Selection of the appropriate surgical approach in frontoethmoidal osteomas depends in general on location, volume, and side of osteoma, on the anatomical conditions as the anterior-posterior diameter of the frontal recess, and on possible extrasinusal extensions (Schick et al., 2001).

For tumours confined to the frontal sinus, the osteoplastic flap technique, preserving the anterior wall of the sinus, is the most satisfactory. A second surgical approach that can be utilized for massive osteomas is the lateral rhinotomy. Finally the cranio-

facial approach is well-suited for large tumours with intracranial extension (Marks and Newman, 1983; Smith and Calcaterra, 1989; Menezes and Davidson, 1994).

Schick et al. (2001) recommended an osteoplastic frontal sinus operation after coronal incision if an external approach is required for frontal sinus osteoma. This procedure offers the chance for excellent aesthetic results and the advantage of maintaining a frontal sinus drainage surrounded completely by bone. Furthermore, the osteoplastic frontal sinus operation after coronal incision is less likely to injure the supraorbital nerve. A coronal incision also allows one to harvest outer-table grafts from the parietal region without an additional incision if frontal reconstruction is necessary.

Endoscopic instruments offer an alternative approach in sinus surgery, enabling closer and more direct visualization of the anatomy as well as avoiding damage to surrounding structures (Huang et al., 2001). Most of small frontal and ethmoid sinus osteomas can be removed endoscopically (Korvunen et al., 1997). In ethmoidal osteomas without significant extrasinusal extension, the endonasal approach allows complete tumour resection (Schick et al., 2001). If the osteoma is huge or broadly attached to the ethmoidal borders, the tumour can be reduced in size with the drill before complete removal is achieved (Reib and Hüttenbrink, 1997).

The endonasal approach should be considered also for frontal sinus osteomas if (1) sufficient frontal sinus access can be achieved endonasally, (2) the osteoma is placed medially to a virtual sagittal plane through the lamina papyracea, and (3) the tumour base is at the inferior part of the posterior frontal sinus wall (Schick et al., 2001).

The long-term prognosis for these tumours is excellent. Sarcomatous change has not been reported, and recurrence after resection is rare (Gillman et al., 1997).

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Dr. Ustun Osma
Dicle Universitesi Tip Fakültesi
KBB Kliniği 21280
Diyarbakir
Turkey

Tel: +90-412-248 8001/4543
Fax: +90-412-248 8520
E-mail: uosma@hotmail.com, uosma@dicle.edu.tr