CASE REPORT
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Surgical Management for Symptomatic Huge Frontoethmoidal Osteoma: A Case Report

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ABSTRACT

Osteomas of paranasal sinuses are slow-growing benign tumour, which is often asymptomatic. The prevalence is highest amongst fourth and sixth decades. Paranasal sinus osteomas are most commonly found in the frontal sinus. Osteomas are usually asymptomatic and found incidentally on radiographic examination. The symptoms depend on its size and location. Common symptoms include frontal pain, nasal discharge, posterior nasal drip, bump over the inner aspect of the lower eyelid and epiphora. We described a case of 34-year-old woman with an enlarging right medial canthal swelling for 10 years, with increased intercanthal distance followed by persistent right nasal blockage. Because of worsening symptoms, she had sought for treatment in which endoscopic approach excision was performed.

Keywords: *Benign bony tumour; endoscopy; osteoma; paranasal sinus; surgery*

INTRODUCTION

Osteoma is a benign osteogenic tumour. It arises from the compact or cancellous bone (Bulut *et al.*, 2010). It is common in the paranasal sinus, involving ethmoid and frontal sinus in 95% of cases (Cheng *et al.*, 2013). Osteomas are often seen in males (Kaplan *et al.*, 1994). It grows gradually and can produce facial asymmetry and other space occupying symptoms in the nose and paranasal sinuses. Osteomas are usually asymptomatic and found incidentally on radiographic examination. The incidence of frontal osteoma was only 0.4% from the reviewed asymptomatic 3,500 skull radiolographs (Childrey, 1939). In some cases, osteoma may produce symptoms related to the surrounding structures.

CASE SUMMARY

A 34-year-old woman complained of swelling at right medial canthus for more than 10 years. It was associated with right epiphora, increased in intercanthal distance and persistent right nasal blockage. There was no epistaxis, nasal discharge, facial discomfort, or frontal pain. Examination of the face revealed a swelling over the right medial canthus, measuring 2 cm × 2 cm. The mass was firm, non-mobile with no sign of inflammation.

Nasoendoscopy showed multilobulated bony-hard mass pushing the inferior turbinate and septum laterally. The mass was insensitive to touch. Biopsy was not possible due to its hard consistency. A CT scan of paranasal sinus revealed a well-circumscribed intra-sinus calcified mass occupying the right frontal and ethmoid sinus as well as right inferior meatus (Fig. 1). Its measurement was 2.6 cm × 2.3 cm × 5.0 cm.

There was also an expansion of right ethmoid sinus causing the remodelling of the medial wall of the right orbit. The right nasolacrimal duct was compressed. Right fronto-ethmoidal recess was obliterated. Right osteomeatal complex was preserved. Mucosal thickening of bilateral maxillary sinuses was noted. Left frontal and sphenoid sinuses were normal. Nasal septum was deviated to the left (Fig. 2). Visualised brain was normal with no focal enhancing parenchymal lesion. Radiological impression was right-sided intranasal calcified mass. The differential diagnosis included chronic mycetoma, less likely a calcified foreign body.

The patient underwent endoscopic excision of right intranasal osteoma. Intraoperatively there was a bony mass occupying the whole right nasal cavity (Fig. 3). The intact septum was pushed to the left side, with left middle turbinate and inferior turbinate lateralised. The mass was removed completely at the lower part and partly from the superior part. As tumour was very huge occupying the whole space in the nasal cavity, it was only managed to be removed in pieces using drill, chisel and mallet (Fig. 4). Posterior part of inferior turbinate, middle part of middle turbinate and posterior choana were clearly visualised after removal of the mass. Merocele was inserted and oral antibiotic was started post operatively. Patient was discharged on the next day.

At one week follow-up after surgery, the patient claimed there was no epiphora, epistaxis, or nasal blockage. Nasoendoscopy showed minimal crusting. Histopathological examination confirmed an osteoma. Microscopically showed fibroadipose and fibrocollagenous tissue with dense lamellar bone having haversian canals and medullary component coexisting of fibrous tissue. The stroma was congested with moderate infiltrations by lymphoplasmacytic cells. No evidence of atypia or malignancy seen.

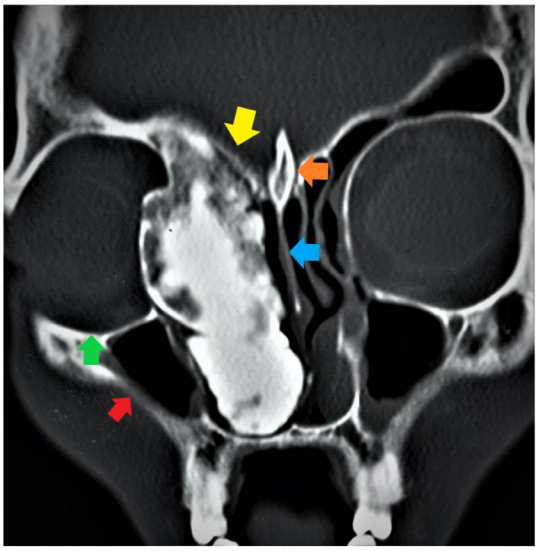

Fig. 1 Coronal CT showed a well-circumscribed calcified mass occupying the right frontal sinus, ethmoid sinus and right nasal cavity. Red arrow: maxillary sinus, green arrow: orbital rim, blue arrow: vomer, orange arrow: crista galli, yellow arrow: base of skull.

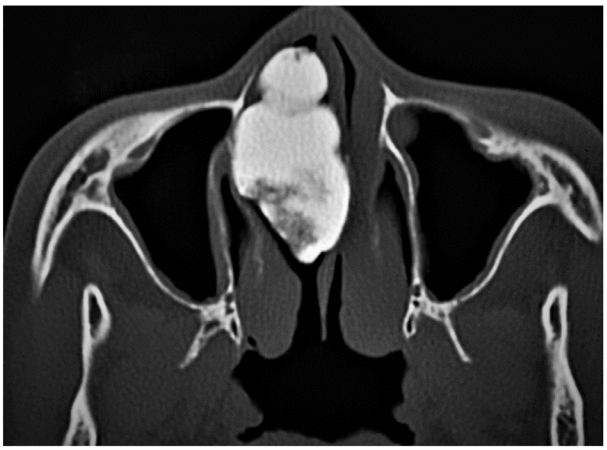

Fig. 2 Axial CT paranasal sinus revealed nasal septal deviation to the left.

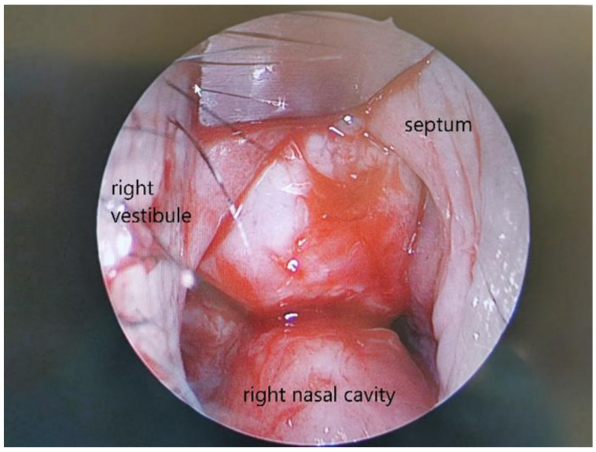

Fig. 3 Intraoperative nasoendoscopic view showed multilobulated whitish bony mass in right nasal cavity.

Fig. 4 Osteoma removed in pieces with the largest was 4.5 cm.

DISCUSSION

The most common benign tumours of the paranasal sinuses are osteoma. The occurrence is around 0.5% with men being slightly more frequently affected (Mesolella *et al.*, 2005). The aetiology includes hereditary, embryonic malformation, inflammation, trauma, calcification of polyposis and calcium metabolism disorder. They are commonly found in the frontal sinus. The tumour grows slowly over time, which may be symptomatic in 10% of cases (Furlaneto *et al.*, 2004).

The symptoms are dependent on its location and size. Drainage and ventilation of paranasal sinuses can be affected by ingrowing osteoma, which distorted the anatomy of paranasal sinuses. In the frontal sinus, the patient might complaint of frontal headache, frontal pain, sensation of pressure, protrusion of anterior wall frontal sinus, which can lead to cosmetically problematic. If osteomas extend beyond the sinus margin, it will cause complications like intracranial mucoceles, meningitis and abscesses (Al-Sebeih and Desrosiers, 1998). In case of sphenoid sinus osteomas, surgical removal should be done immediately because of the probable danger of the rapid compression on the visual pathways that leads to blindness (Mansour *et al.*, 1999).

Osteomas in fronto-ethmoidal complex may cause headache (49%), proptosis (40%), diplopia (18%) and hypoesthesia (13%). In ethmoidal osteoma, the ocular symptoms were much more common (66%) while in frontal osteoma, the headache was much more common (61%) (Cheng *et al.*, 2013). Giant frontal osteoma predominantly causes intracranial complication (54%) while giant ethmoidal osteoma causes more intraorbital complication (69%) (Cheng *et al.*, 2013). In our case, the patient did not complain of any intracranial or ocular symptoms. The main symptoms in our patient were right epiphora and right nasal blockage.

CT scan is the excellent imaging modality for the diagnosis of osteomas. It specifies the anatomical location and the tumour extension. In case of incomplete resection, the recurrence rate was 10% and no malignant transformation has been reported (Grayeli *et al.*, 1998).

In asymptomatic osteoma, the surgical intervention is not indicated (Castelnuovo *et al.*, 2008). There is no role for medical treatment in osteoma. In our case, surgical removal was indicated as she had the troublesome right epiphora and persistent right nasal blockage. The approach was either by external nasal, endoscopic or combination of both. We partly removed the osteoma by endoscopic approach by using telescope (0°, 30° and 70° angles of view) with few types of surgical instruments. We had difficulty to remove all the tumours as it was huge and extending to the frontal sinus. We also anticipated the problem during the endoscopic removal as there was no adequate space for surgical instrument to enter the intranasal cavity. However, we managed to remove the lower part of osteoma at the level of middle turbinate to relieve the symptoms (nasal blockage and epiphora) and to avoid any external scar in this young female patient. She remained symptom-free during the one-month clinic review. Endoscopy assessment showed no evidence of regrowth of the mass. The follow-up was done for six months.

Frontal sinus osteoma is staged according to system proposed by Chiu *et al.* (2005) (Table 1). In Stages 1 and 2, the operation can be done by endoscopic surgery while in Stages 3 and 4 by external approach. The external approach gives the surgeon a wider vision, but the disadvantages are post operation oedema, pain and incision scars. Frontal ethmoidectomy (Lynch procedure) and osteoplastic flap can be done in external approach (Yiotakis *et al.*, 2008). Our patient was categorised as Stage 4, as the tumour had already filled up the whole frontal sinus.

Table 1 The frontal sinus osteoma staging system by Chiu *et al.* (2005)

Stage	Criteria
Stage 1	Source of the osteoma posterior and inferior in the frontal recess; localisation of the osteoma medial to a virtual sagittal plane passing over the lamina papyracea; anteroposterior (AP) diameter of the tumour is fewer than 75% of the AP diameter of the frontal sinus.
Stage 2	As stage I; AP diameter of the tumour larger than 75% of the AP diameter of the frontal recess.
Stage 3	Source of the osteoma anterior and/or superior in the frontal sinus and/or osteoma spreading lateral to a virtual sagittal plane passing through the lamina papyracea.
Stage 4	The tumour filling the whole frontal sinus.

CONCLUSION

Even though osteoma is a slow growing benign tumour, symptomatic paranasal sinus osteoma needs surgical excision. The extent of removal is a multi-factor dependant decision. Avoiding facial scar for cosmetic reason in a young woman is important as long as the symptoms are eradicated. CT scan is the best imaging modality to look for the site and extension of tumour. Endoscopic approach offers safe removal of tumour with better cosmetic outcomes. The external approach might be considered in the future if the tumour re-expands and symptoms recur.

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