

## CASE REPORT

# Ethmoidal Mucocele: Simple Modern Management of Ophthalmic Manifestation

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## ABSTRACT

A mucocele of paranasal sinus is an accumulation of mucoid secretion and desquamated epithelium within the sinus with distention of its walls. It is considered as a cyst-like expansile and destructive lesion. If the cyst invades the adjacent orbit and continues to expand within the orbital cavity, the mass may present the behavior of many benign growths primarily in the orbit.

Frontoethmoidal area is more susceptible to mucocele formation due to complexity of its drainage as compared to other sinuses. Frontoethmoidal mucocele usually presents with outward and downward displacement of orbital globe and is associated with palpable mass in the superionasal and medial canthal region.

In this case report, a 55-year-old woman presented with complaint of painless swelling, protrusion, and deviation of the right eye since 1 year. High resolution computed tomogram (HRCT) showed a well-defined lesion in the anterior ethmoidal region with marked thinning of lamina papyracea. Endoscopic marsupialization with frontoethmoidectomy was performed.

**Keywords:** Frontoethmoidal mucocele, Frontoethmoidectomy, Marsupialization.

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## INTRODUCTION

A mucocele of paranasal sinus is an accumulation of mucoid secretion and desquamated epithelium within the sinus with distention of its walls. It is considered as a cyst-like expansile and destructive lesion. If the cyst invades the adjacent orbit and continues to expand within the orbital cavity, the mass may present the behavior of many benign growths primary in the orbit. Frontoethmoidal area is more susceptible to mucocele formation due to complexity of its drainage as compared to other sinuses. Frontoethmoidal mucocele usually

presents with outward and downward displacement of orbital globe and is often associated with palpable mass in the superonasal and medial canthal region.

Sinonasal endoscopic marsupialization of frontal sinus mucoceles was reported for the first time. Currently, this surgical approach is considered the first choice of treatment because it is less invasive and has less morbidity compared to conventional techniques, such as external frontoethmoidectomy and osteoplastic flaps with or without obliteration of frontal sinus.

## CASE REPORT

A 55-year-old woman from Shimla came to the ENT OPD with complaints of deviation of the right eye and swelling above and at the corner of the eye since 1 year (Fig. 1). It was insidious in onset and gradually progressive in nature. There was history of visual impairment and pain in eye. There was no history of trauma to the eye and nose. There was intermittent history of nasal obstruction on the right side.

On examination, there was a swelling at the right medial canthal region, which was nontender, soft-to-firm in consistency, and pushing the eyeball laterally and forward. Nose examination was grossly normal with high DNS toward left side. There was no discharge or polyps seen in anterior rhinoscopy. Visual acuity was 6/24 on the affected side and ocular movements were normal. Throat examination was normal. The patient

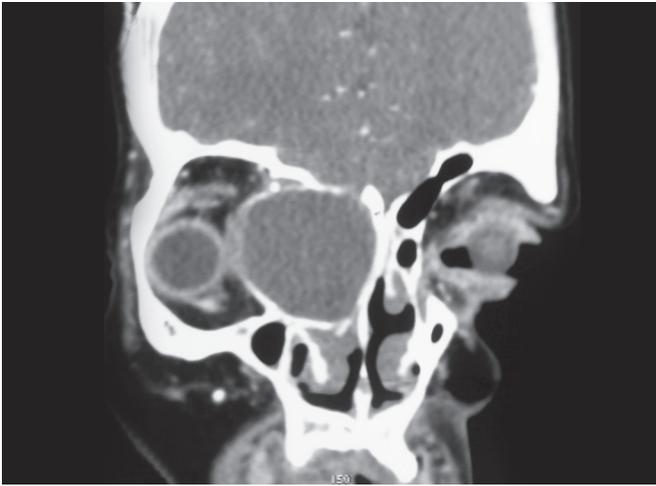


Fig. 1: Preoperative image of patient

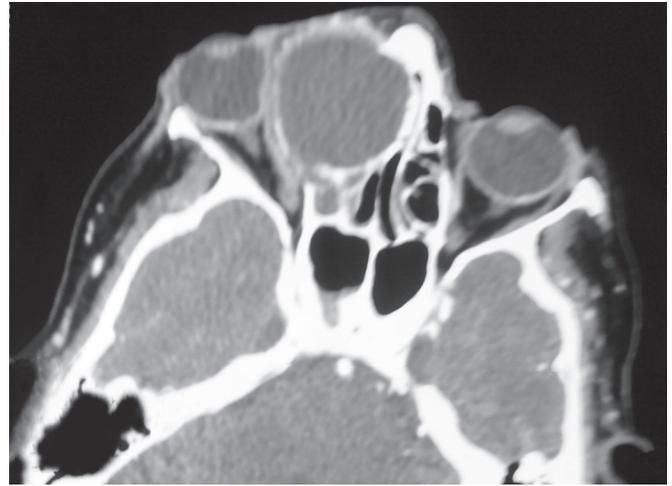
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**Fig. 2:** Coronal computed tomography image of frontoethmoidal mucocele



**Fig. 3:** Axial computed tomography image of frontoethmoidal mucocele with orbital displacement

was admitted in the ENT department and started on conservative treatment and was investigated. Blood investigations were within normal limits. The patient was posted for high resolution computed tomogram (HRCT) scan of the nose and paranasal sinus. It showed a well-defined expansile lesion of about 3 × 3 cm, involving the anterior ethmoid region that had displaced eyeball laterally (Figs 2 and 3). There was no evidence of any collection or necrotic material. There was marked thinning of lamina papyracea of the affected site.

The patient was posted for endoscopic sinus surgery on following day. Endoscopy confirmed the findings of high DNS toward the left side and normal nasal mucosa. On medialization of middle turbinate of the right side, there was a cystic mass visualized in the middle meatus. There was whitish mucoid discharge from the cyst on incision. It was suctioned and all the walls of this mucocele were removed properly under endoscopic guidance. The eyeball returned to normal position and gave immediate relief to the patient. Medicated nasal packing was

done on the right side, which was removed the next day. Nasal douching was done regularly for the next 1 week. By the end of the first week postoperatively, the patient's eyeball returned back to completely normal position (Fig. 4) and the patient was discharged (Fig. 5). Regular follow-up was done in ENT OPD with no fresh complaints.

## DISCUSSION

Clinical aspects of mucoceles affecting the frontal sinus were primarily described by Langenbeck, and Berthon proposed surgical drainage of this type of lesion. The term mucocele was introduced by Rollet and the first histopathological description was made by Onodi.

Mucocele is a cystic lesion of the epithelial layer that lines the paranasal sinuses and contains thick mucus inside. It has slow growth and expansive characteristics.<sup>1</sup>

Its etiology is believed to be obstruction of drainage ostium of the affected paranasal sinus due to chronic processes of rhinosinusitis (infectious or allergic), nasosinusitis polyposis, craniofacial trauma, previous surgery,



**Fig. 4:** Patient image on postoperative day 4



**Fig. 5:** Patient image at the time of discharge

benign tumors (osteomas, bone fibrous dysplasia), or malignant neoplasms (primary or metastatic).<sup>1-3</sup>

It occurs more commonly in frontal and ethmoidal sinuses, but sphenoid and maxillary sinuses may also be affected. In the maxillary sinus, previous history of Caldwell-Luc surgery is almost present.<sup>2,4,5</sup>

The common presenting features of frontoethmoidal mucocele are orbital displacement, frontoethmoidal swelling, impairment of vision, or headache. It may present as a discharging fistula in the same region if it bursts spontaneously or attempts are made to drain it externally.<sup>2</sup> Similarly, Tseng et al<sup>6</sup> found proptosis as most common presentation in patient with frontoethmoidal mucocele.

Pathophysiology of the mechanism of bone resorption produced by mucoceles is still obscure. It is believed that osteolysis is produced by reduction of vascularity of the bone due to compression and/or by the action of inflammatory mediators abundantly present in the mucous of this affection, such as cytokines (IL1, IL6), vascular adhesion molecules, and prostaglandins.<sup>2,7</sup>

The diagnosis is mainly based on imaging and examination. Even though simple X-ray may show opacification, bone erosion, or expansion, a computed tomography (CT) scan is the preferred investigation because it shows bone involvement, assesses intracranial and/or orbital extension, and supports surgical planning.<sup>8</sup>

Differential diagnoses of frontoethmoidal mucocele include encephalocele, cholesterol granuloma, neurofibroma, salivary adenoma, paraganglioma, angiofibroma, epidermoid cyst, meningioma, chordoma, and malignant neoplasms.<sup>9</sup>

The objective of therapy is to remove the cyst completely and restore the drainage from the occluded sinus into the nose.

Treatment of mucoceles is surgical and the access approaches may be either external or endonasal. External approach is made through frontoethmoidectomy (Lynch's procedure) or by osteoplastic flaps with or without frontal sinus obliteration and total excision of mucosa.<sup>10</sup> The current tendency is to conduct functional, less-invasive, and low-morbidity procedure with sinonasal endoscopic

surgery, with marsupialization and abundant drainage of the lesion, preserving the epithelium.<sup>1,3,10</sup>

Outpatient follow-up with nasal endoscopy is necessary to ensure disease control. Imaging, such as CT scan and magnetic resonance imaging (MRI) may be useful, especially when there is suspicion of lesion recurrence.

## CONCLUSION

Mucoceles are benign lesions of expansive character that may cause severe complications at orbital and intracranial levels and for this reason they should be diagnosed and treated early. Marsupialization with drainage through sinonasal approach proved to be a safe and efficient procedure in therapeutic approaches of frontoethmoidal mucoceles.

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