

Ethmoid mucocele and post traumatic nasal deformity

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Abstract

This study is a case report of ethmoid mucopyocele with external nasal deformity as a delayed complication of trauma to the nose and paranasal sinuses with complete removal of the mucopyocele and intra operative correction of the nasal deformity.

Keywords: Ethmoid, Endoscopic marsupialization, Mucopyocele, Proptosis, nasal bone deformity

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1-INTRODUCTION

Mucoceles are epithelium-lined cavities in the paranasal sinuses filled with mucus. They develop because of scarring and obstruction of the sinus ostium, whether from chronic sinusitis, trauma, or surgery. They commonly erode the bony sinus wall and can have serious complications such as brain and orbital invasion, with potential for abscess formation and rupture (1).

Mucocele is a cystic slow-growing lesion of paranasal sinuses with sterile content. Pyocele contains purulent substance. Muco-/pyocele is rarely localized in ethmoid or sphenoid sinuses and may involve the orbit and cause ophthalmic complications including visual loss (2).

The accumulation of fluid under pressure results in sinus wall remodeling. In fact, it is the most common expansile lesion of the sinuses. Mucoceles are typically solitary, although multiple lesions may occur (3). Mucoceles most commonly occur in the frontal sinuses (60%–65%), where they may erode into the orbit, resulting in proptosis. The ethmoid sinuses are the second most commonly

involved areas (20%–25%) followed by the maxillary and rarely the sphenoid sinuses (20). Initially, the appearance of a mucocele may be indistinguishable from a completely opacified sinus due to acute sinusitis (3). However, with time, there is expansion of the sinus cavity and bony remodeling. Focal lytic changes also may occur, resulting in wall dehiscence. Sinus contents may bulge through bony defects into adjacent regions, and these destructive bony changes may mimic sinus malignancy. The MRI appearance of a mucocele depends on the relative water and protein concentration of its contents. The mucocele may resemble a neoplasm, but generally the T1 and T2 patterns suggest the diagnosis of proteinaceous fluid. With the administration of gadolinium, an MRI contrast agent, a mucocele typically demonstrates thin, regular peripheral enhancement of the mucoperiosteal lining, whereas a neoplasm rarely has a cystic appearance (3).

Mucocele originates by blockage of the paranasal sinuses ostium with mucinous retention inside, sometimes purulent (mucopyocele), and progressive slimming with gradual destruction of the bone walls (4).

Orbital mucoceles manifest similar signs and symptoms, such as orbital displacement, proptosis, diplopia, ophthalmoplegia, and decreased visual acuity. Ophthalmic involvement may be the first sign of the mucocele (4).

Management of orbital mucoceles includes complete removal of the cystic lining, reestablishment of normal drainage, or obliteration of the sinus by mucosal stripping and packing with bone or fat. This is usually the domain of the otorhinolaryngologist, but ophthalmologic expertise may play an important role in the management of orbital mucoceles (4).

The numerous bony partitions within the ethmoid sinus are at risk of mucocele development in the postsurgical cavity as scarring and secondary obstruction may develop. An MRI scan is recommended in the preoperative evaluation as well. Once the presence of a mucocele is confirmed, endoscopic marsupialization of these lesions is performed by initial entry into the lesion followed by removal of surrounding osteitic bony partitions (5).

Where there is a significant scarring along the ethmoid roof, identification of the skull base may be difficult. In these cases, the skull base is identified within the sphenoid sinus at its lowest point, and is then skeletonized in a posterior to anterior direction. The dissection progresses to the region of the mucocele. As mentioned earlier, the use of through-cutting instruments along the skull base cannot be emphasized enough in order to avoid inadvertent skull base injury (5).

As mentioned, mucoceles can present years, and even decades from trauma. The average time between trauma and surgical confirmation of a mucocele has been reported at 7.5 years (6).

Koudstaal and his colleagues 2000 reported a series of three mucoceles following maxillofacial trauma. The longest delay in presentation in their series was 35 years (4, 7). For this, they advocate lifelong follow up for patients who have suffered sinus trauma. Although these are rare, they must be kept in the differential for patients presenting with a history of trauma (7).

Infection of the mucocele leads to formation of a mucopyocele. This infection can lead to rapid enlargement of the mucocele with increased risks of extra sinus complications. Pathogens associated with mucopyoceles are often common sinus pathogens associated with acute and chronic rhino sinusitis (6).

The mucocele must be opened, and the cavity drained. Although some authors still recommend complete evacuation of the cystic cavity with complete removal of the respiratory mucosa, most otolaryngologists would argue against that (8). By opening the mucocele and allowing for drainage, mucociliary clearance may be re-established. Often times, the bony remodeling will return to a near-normal state, responding to the external pressures on the sinus once the intramucocele pressure has been relieved (6).

Our aim is to discuss the endoscopic management of ethmoid mucocele with intraoperative correction of nasal deformity.

2- CASE REPORT

A 35-year-old man came to our ENT clinic complaining of right painless gradually increasing nasal swelling since seven months with no history of fever, nasal obstruction or nasal discharge (Fig. 1). The patient reported a history of Road Traffic Accident twenty years ago resulting in fracture nasal bone and external nasal deformity. No other complaint, no ophthalmic symptoms. On clinical examination we found an external deformity of the nose with nasal bony defect at the right side of the nasal bone with cystic globular mass at the right medial canthus of the eye and bulging from the nasal defect about 2x3 cm with normal skin over it. Not tender, normal eye movement and lacrimation.

Intranasal examination revealed a fleshy mass occupying the upper part of right nasal fossa pushing the middle turbinate medially.

CT scan of the paranasal sinuses revealed rounded mass in the right ethmoid sinus bulging externally from nasal bone defect and Rt lamina paparecia so diagnosis made as ethmoid sinus mucocele (Fig. 2, 3).

Patient was referred to ophthalmologist to asses ocular movement and visual acuity which were normal.

Patient underwent functional endoscopic sinus surgery under general anesthesia. The mucocele opened and thick purulent secretions sucked out. Swelling above right eye regressed immediately. Endoscopic marsuplisation of ethmoid mucopyocele and correction of nasal bone deformity done in the same time (Fig. 4).

Patient recovered without complications and was discharged on the second day with dramatically relief of the swelling. He underwent follow up in our ENT clinic for nine months without recurrence or any complaint (Fig. 5, 6, 7, and 8).



Fig (1) showing the right ethmoid mucocele pre-operatively.



Fig (2) CT scan of PNS viewing the ethmoid mucocele in the right side.

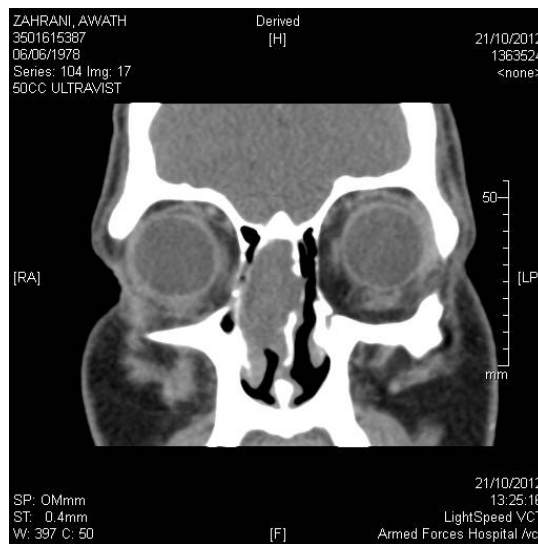


Fig (3) CT scan of PNS coronal view showing the right ethmoid mucocele.



Fig (4) endoscopic view intra operative evacuation of the mucopyocele.

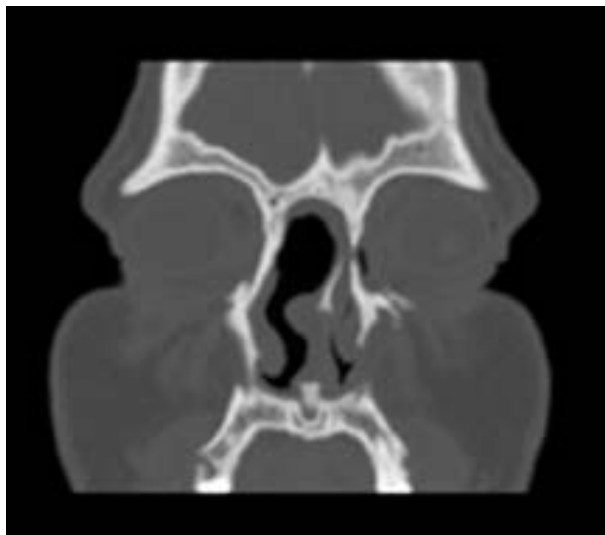


Fig (5) CT scan paranasal sinuse three months postoperative showing complete disappearance of the mucocele.



Fig (6) CT scan axial view paranasal sinus post-operative showing complete removal of the mucocele.



Fig (7) postoperative showing complete disappearance of the swelling.

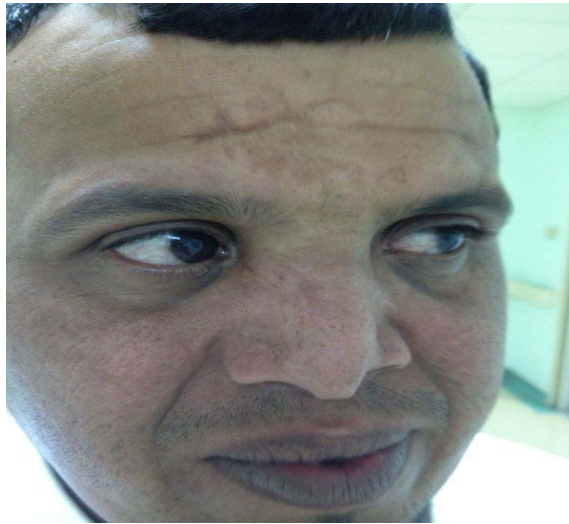


Fig (8) post-operative showing disappearance of the swelling and correction of the nasal deformity.

3- RESULTS AND DISCUSSION

Using endoscopic sinus surgery, complete evacuation of the mucopyocele was achieved and intra operative correction of the external nasal deformity was done.

By definition, mucoceles are benign cystic lesions of the paranasal sinuses. They are composed of upper respiratory tract pseudo stratified columnar epithelium that maintains its normal function of mucus secretion (8, 9). The mucocele is a unique disease of the paranasal sinuses, which destroys the surrounding bony structure in spite of its benign nature (8). The etiology of mucoceles is mainly from the blockage of a sinus cell ostium (8,10). Blockage may occur spontaneously without sinus abnormality or as a result of trauma, postsurgical injury, tumor growth, chronic inflammation, or infection.4-7,8 Orbital mucoceles occur when paranasal sinus mucoceles invade the orbit by direct expansion or erosion of the orbital wall (8,11). Mucoceles may develop at any age, but are most likely to occur in the fourth to fifth decades of life.

The majority of mucoceles occur in the age group between 40 to 70 years. There is a slight male preponderance overall but right and left sides are equally affected. The formation of mucocele is

attributed to a combination of obstruction of the affected sinus and inflammation [7]. Obstruction can be due to previous surgery or trauma but, a significant proportion (36%) has no such factor. Expansion of the mucocele generally follows the route of least resistance that is into the orbit. So, the majority of patients of ethmoid mucocele exhibit some degree of proptosis, limited ocular motility in upward gaze, sometimes with a characteristic 'egg shell' cracking sensation due to thinned overlying bone. Conversion to a pyocele, with additional infection will cause rapid expansion, compromising vision (13). Thus, majority of patients are initially referred to ophthalmic surgeon.

Mucocele or mucopyocele of the posterior ethmoid and sphenoid sinus cause retro-orbital headache, facial pain and diplopia, proptosis, ophthalmoplegia and visual loss. In severe cases, intra cranial extension may produce meningitis and raised intra cranial pressure.

Plain sinus X-ray of a frontoethmoid mucocele shows the classical features of an expanded Frontal sinus with loss of the scalloped margin and translucence and depression or erosion of supra orbital ridge. CT scans show a homogenous smooth walled mass, expanding the sinus, with thinning and loss of bone. There may also be evidence of new bone formation or sclerosis. CT with intravenous contrast characteristically shows ring enhancement in the presence of a pyocele.

Lateral sinus X-ray may show expansion of the sphenoid, with elevation or erosion of the floor of Pituitary Fossa. Sphenoid sinus and maxillary sinus mucoceles are best seen on CT scan and distinguished from other pathology like acute and chronic Sinusitis, polyps, retention cysts, dermoids and cholesterol granuloma and a range of benign and malignant neoplasms.

Now, mucocele can be approached endoscopically, which avoid external incision and associated morbidity and has distinct advantage over external frontoethmoidectomy (14). The displacement of globe may take several months to resolve completely while bone remodeling occurs (14).

5-CONCLUSION

As discussed, there is a paucity of information in the literature about long-term or delayed complications from sinus trauma. Even with a remote trauma history. When dealing with mucoceles deformity, the surgeon might attempt to completely evacuate the mucocele and correct the external nasal deformity intra operatively.

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