

Case Report

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Frontoethmoid mucocele: a case report

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ABSTRACT

Mucoceles are cystic lesions of the paranasal sinuses that develop as a result of mucous secretion accumulation due to sinus ostium obstruction. Mucoceles are most common in the frontal and ethmoidal sinuses, and they affect both men and women equally. They may become infected and spread to the orbital cavity, compressing the orbit by eroding the orbital cavity's bony walls. In surgical treatment, endoscopic approach is used. We present a case of a complicated ethmoid mucocele that eroded the orbital wall and spread into the orbital cavity, and we discuss surgical treatment options in light of the existing literature.

Keywords: Frontoethmoid mucocele, Endoscopic marsupialization, Sinonasal approach

INTRODUCTION

Mucoceles erode the sinus walls, expanding into the surrounding tissues and creating a pressure effect once they achieve a certain size. Secondary infection may cause rapid expansion, increasing the risk of complications, especially in the periorbital region, swelling in the superonasal and medial canthal regions, ptosis, and inferolateral globe displacement are all typical symptoms of frontoethmoidal mucoceles. CT scanning in both the axial and direct coronal planes is the imaging of choice. It shows the mucocele as a well-defined, cyst-like, homogeneous lesion that begins in a paranasal sinus and compresses the surrounding structures.¹ Bone erosion is caused by mass impact and the presence of cytokines including IL-1 and IL-6.² However, extensive histopathologic studies have found little support for this mechanism, instead pointing to mucocele expansion being induced by the complex interaction between bone and mucocele lining. It is generally thought that following obstruction of the frontal recess and subsequent infection within the frontal sinus cavity, continued

stimulation of lymphocytes and monocytes leads to the production of cytokines by the lining fibroblasts. These cytokines, in turn, promote bone resorption and remodeling and result in expansion of the mucocele.³ A history of sinusitis, prior sinus surgery, allergies, and trauma are all common etiologic factors linked to the development of frontoethmoid mucoceles. Mucocele formation may occur as a result of surgery that either directly blocks the sinus ostium with scar tissue or entraps sinus mucosa. It is possible for postsurgical sinus mucoceles to grow up to several years after the initial surgery.⁴ Mucoceles are uncommonly developed as a result of an ostial occlusion caused by a benign neoplasm (osteoma, fibrous dysplasia), or a malignant tumor (osteoma, fibrous dysplasia).⁵ However, in up to 1/3rd of cases, the past is irrelevant and there is no identifiable cause.⁶

CASE REPORT

A 20-year-old man presented with diplopia and a swelling in the right eye's medial canthus. These signs

were first noticed six months prior. However, he noticed that his diplopic symptoms had increased since then. He noticed that the right side of his nose was runnier than the left, and he had some discharge from his right eye. He suffered from headaches on the right side of his head and face on occasion. These were described as occasional pains. Over-the-counter pain relievers were used to alleviate the pain. Aside from that, the ocular history was unremarkable. The social and family backgrounds of the participants are unremarkable. Best-corrected visual acuities were 20/20 in the right eye (OD) and 20/20 in the left eye (OS).

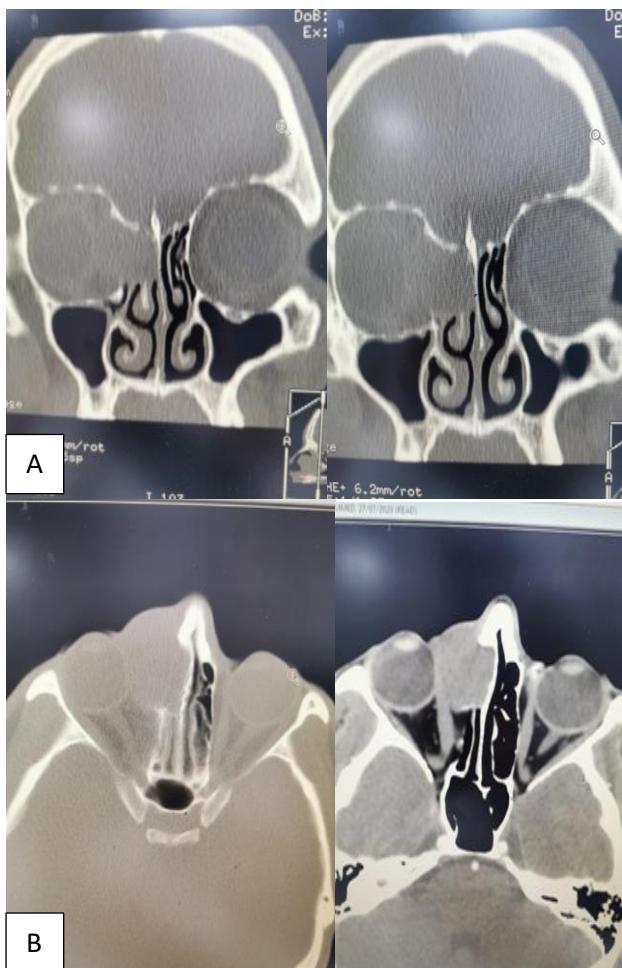


Figure 1: (A) Right ethmoid mucocele on coronal CT scan. (B) Ethmoid mucocele axial CT images.

Figure A right ethmoid mucocele can be seen on coronal CT scan. The medial orbital wall has been eroded, and the right medial rectus muscle has been compressed. In the picture on the right, note how close the mucocele is to the optic nerve.

Figure B ethmoid mucocele can be seen on axial CT images. The medial orbital wall has been disrupted by bony erosion, and the right medial rectus muscle and globe have been compressed. There is little space between the right medial rectus and the optic nerve, despite the fact that the optic nerve is not yet involved.



Figure 2: Initial presentation: note swelling in the right eye's medial canthus.



Figure 3: Patient in the recovery area noted complete subsidence of swelling on the right medial canthus after endoscopic approach for anterior ethmoidectomy and marsupialization of mucocele.



Figure 4: The patient follow-up 1 week after undergoing the surgical.

The patient follow-up 1 week after undergoing the surgical removal of ethmoidal mucoceles. he underwent an uncomplicated endoscopic anterior ethmoidectomy, which resulted in immediate symptom relief. As previously mentioned, the mucocele was leading to the right eye's right-sided supraduction and adduction limitations. He was no longer feeling diplopia, and his eyes and head were free of pain or pressure. He didn't note any other visual or ocular signs, and his vision in each eye seemed to be fine. After that, he didn't get any more neuroimaging studies done. After surgery, he was given a long-term course of oral antibiotics and saline nasal spray. In postsurgical follow-up, he had been examined by the otolaryngology service several times, and the patient confirmed that all was going well.

DISCUSSION

Mucoceles are slow-growing cystic lesions that form when the sinus ostium is obstructed.⁷

The majority of cases occur in patients between the ages of 40 and 60 who have a similar male:female preponderance.⁸

Mucocele development is caused by chronic inflammation of the sinus mucosa, which is induced by etiological factors such as sinus mucosal inflammation, nasal polyp, structural alterations of the nasal cavity, tumors, or traumas.⁹

Mucoceles of the paranasal sinuses are most frequently found in the frontal (65%), anterior ethmoid (30%), and maxillary sinuses (3-10%).¹⁰

The sphenoid and posterior ethmoid sinuses are rarely involved.¹¹

Many patients initially present with orbital symptoms, the most common of which are progressive proptosis and diplopia.¹²

Orbital symptoms are normal as a result of anatomical proximity. Mucoceles form 4-8.5% of the orbital masses that are expanding.¹³

As a mucocele develops, it progressively spreads, causing bone deterioration and remodeling, which may contribute to mucocele expansion into surrounding sinuses, the orbit, nasal cavity, nasopharynx, and cranial cavity. Inflammatory mediators such as prostaglandins, interleukins, and tumor necrosis factor are present inside the mucocele and contribute to its capacity to grow, in addition to pressure changes on surrounding structures, secondary infection can facilitate the expansion of mucoceles in the paranasal sinuses.¹⁴

The gold standard diagnostic technique for detecting soft tissue lesions is magnetic resonance imaging (MRI). CT scans are used because they are better at visualizing

bones, providing information about coronal, sagittal, and axial planes, and allowing three-dimensional studies, the first series of 18 mucoceles treated by endoscopic marsupialization was reported in 1989 by Kennedy et al. After an average of 18 months of follow-up, their analysis showed that there was no recurrence.¹⁵

Surgery is used to treat mucoceles. The surgery's aims are to remove the mucocele with reduced morbidity and avoid recurrences. The size, location, and extent of the mucocele decide the surgical method. Adjuvant antibiotic therapy is advised in the case of infection. Since many of these lesions have an intracranial or intra-orbital component, surgery should be avoided if an infection is present. An acute symptomatic mucocele is an exception. The entire lining of a sinus mucocele must be removed, according to conventional teaching in the United States. External approaches (Lynch-Howarth frontoethmoidectomy) or osteoplastic flaps with sinus cavity obliteration were used in the past. These procedures were associated with severe morbidity and cosmetic deformity, as well as a high recurrence rate.¹⁵ Because of the low risk of recurrence, an endoscopic treatment is suggested for uncomplicated mucoceles. In the small pediatric series reported by Hartley et al no complications were reported. Endoscopic drainage of ethmoid and sphenoid mucoceles was performed on seven infants, and there were no recurrences after a one-year follow-up.¹⁶ However, in complicated infectious cases extending into the underlying tissues due to bony destruction, external methods are suggested to be more convenient.¹⁷

CONCLUSION

Mucoceles are benign lesions with expansive feature that may produce significant problems at orbital and intracranial levels and for this reason they should be detected and treated early. Marsupialization with drainage through sinonasal method shown to be a safe and efficient method in therapeutic approaches of frontoethmoidal mucoceles.

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