

Frontoethmoidal mucocele causing proptosis and visual loss

ABSTRACT

Mucoceles are benign mucus-containing cysts formed due to the obliteration of sinus ostium. They are most commonly found in the frontal sinus. Mucoceles can spread both intraorbitally and intracranially causing complications such as meningitis, brain abscess, and loss of vision. Radiological investigations are required for diagnosis, with both computed tomography (CT) and magnetic resonance imaging (MRI) being useful. Surgical approaches for management have changed from external to endonasal these days. We report a case where a 54-year-old patient presented to us with a 14 days' history of loss of vision and complete closure of eyes over 2 days. Contrast-enhanced CT scan and MRI confirmed the diagnosis of frontoethmoidal mucocele breaching the left frontal sinus floor. Endoscopic orbital decompression with functional endoscopic sinus surgery was done. Eye movements and ptosis recovered completely after the surgery, but the vision did not. Although the etiology of mucocele is multifactorial, obstruction of sinus ostium is the most plausible cause. Increasing pressure on adjacent structures by the expanding mucocele can cause intraorbital and intracranial complications. MRI is superior to CT in differentiating mucocele from soft-tissue neoplasms, although CT gives a more detailed information on bone structure. Endoscopic approaches have become the most preferred way to access frontoethmoidal mucoceles, with external approaches being reserved for mucoceles in certain inaccessible locations. Timely intervention is imperative to prevent undesirable complications.

Keywords: Mucus, radiology, sinus obliteration, urgent interventions

INTRODUCTION

Mucoceles are benign mucus-containing cysts. They form due to the obliteration of sinus ostium. Frontal sinuses are the most commonly involved among all the sinuses. Floor of frontal sinus is shared with superior orbital wall, which explains the early displacement of orbit in enlarging frontal mucoceles.^[1] Clinical features include pain, swelling, diplopia, restricted mobility of eyeball, and loss of vision. Mucoceles of paranasal sinuses are treated by endoscopic approach with external approaches used depending on the location and extent.

CASE REPORT

A 54-year-old male patient presented with complaints of headache and sneezing for many years. He had pain in his left eye for 14 days with swelling and complete closure of the eye over 2 days [Figure 1]. He also suffered

a sudden loss of vision 14 days back in that eye. He was evaluated by an ENT specialist at a different hospital, who asked for radiological imaging and referred to us for further management. Contrast-enhanced computed tomography (CT) scan showed disease in anterior and posterior ethmoids of the left side and blocking of the frontal sinus outflow tract. Sphenoid sinuses were not involved, and lamina papyracea was intact bilaterally. There was a breach in the floor of left frontal sinus. There was mucosal thickening in the right maxillary sinus.

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[Figures 2 and 3] MRI showed intact optic nerve with no erosion of orbital apex and no intracranial extension.

On physical examination, the patient had a fluctuant swelling over his left eye. Ptosis was present and the eyeball was pushed inferiorly and laterally. Extraocular movements were restricted in all directions. Anterior rhinoscopy showed a right-sided deviated nasal septum and normal-appearing nasal mucosa. Endoscopic orbital decompression of the left orbit with bilateral functional endoscopic sinus surgery (ESS) was done in the presence of ophthalmologist and neurosurgeon. Polypoidal mucosa in the frontal recess and infundibulum was dissected out. Frontal sinus was opened. Pus was drained out.[Figures 4 and 5] Multiple saline irrigations were given to clear the frontal sinus completely. On postoperative day 1, extraocular movements improved in all directions, but there was no improvement in ptosis and vision. During follow-ups, endoscopic suctioning and irrigation were done. By 15 days postoperatively, the patient's eye movements

improved completely. There was improvement in ptosis, but no improvement in vision. He has been on regular follow-up subsequently with endoscopies being done to rule out any recurrence.

DISCUSSION

Mucocele is an epithelium lined mucus-containing sac completely filling a paranasal sinus and capable of expansion by virtue of a dynamic process of bone resorption and new bone formation.^[2] Etiology of mucocele is multifactorial. Obstruction of sinus ostium is one of them. With continued secretion and accumulation of mucus, increasing pressure causes atrophy or erosion of the bony walls of the sinus, allowing the mucocele to expand in the path of less resistance.^[3] It can spread both intraorbitally and intracranially. It is most commonly found in the frontal sinus and rarely in the sphenoid or maxillary sinus.



Figure 1: Complete closure and proptosis of the left eye



Figure 2: Contrast-enhanced computed tomography scan showing frontoethmoidal mucocele with breach in the floor of the left frontal sinus. soft tissue density seen in the right maxillary sinus



Figure 3: Contrast-enhanced computed tomography scan showing intact lamina papyracea on both sides with clear sphenoid sinuses

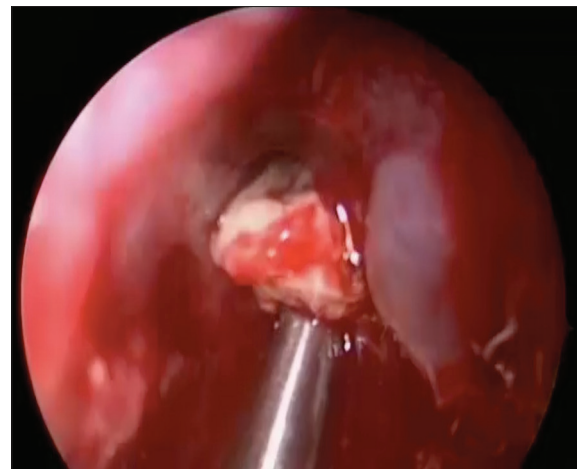


Figure 4: Clearance of the frontal recess



Figure 5: Draining of pus from the frontal sinus

Common symptoms are headache, exophthalmos, ptosis, and diplopia. If the posterior table of the frontal sinus gets eroded with consequent invasion of the anterior cranial fossa, the contaminated contents of the mucocele may cause meningitis or brain abscess with or without a CSF fistula.^[4] In our case, the patient gave history of sudden loss of vision and ptosis. Prolonged pressure by the mucocele erodes the bone over optic nerve and causes circulatory changes in the nerve.^[5] This can cause loss of vision. Radiological investigations play a vital role in diagnosing. CT scan gives detailed information on bone structure and demonstrates an airless, mucoid density filled, expansile, nonenhancing sinus mass with gradual thinning and erosion of bony margins. Magnetic resonance imaging (MRI) is superior to CT in differentiating a mucocele from soft-tissue neoplasms and identifying its relationship with adjacent soft tissues of the brain and orbit.^[6] MRI exhibits variable signal intensities on both T1- and T2-weighted images, depending on the state of hydration, protein content, and viscosity of the contents of the mucocele. Definitive treatment is surgical. Earlier, mucoceles were removed mainly using external approaches. In these days, external approaches to the frontal sinus are used only for far laterally located lesions often combined with endoscopic sinus surgeries. A study done by Bockmühl *et al.* shows endonasal surgery as a reliable treatment with favorable long-term outcomes for paranasal sinus mucocele

management.^[7] According to Trimarchi *et al.*, those mucoceles that extend medially to a virtual sagittal plane tangential to the medial side of the ocular globe, are approachable through ESS.^[8] Due to their erosive potential, mucoceles can become quite morbid and cause far-reaching complications such as permanent vision loss, meningitis, and brain abscess.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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