Frontoethmoid Mucocele causing Unilateral Proptosis

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ABSTRACT

Introduction

Mucoceles occur most frequently in the frontal and ethmoidal sinuses, without gender prevalence. Presenting symptoms can include facial pain, headache, nasal obstruction, diplopia, decreased visual acuity, orbital globe displacement, facial swelling and meningitis, depending on the anatomic area involved. The gold standard in terms of diagnostic precision is computed tomography scan.

Case Report

The present study describes case of frontoethmoidal mucocele with orbital involvement that was treated by transnasal endoscopic approach obtaining good outcomes, demonstrating safety and efficacy of this surgical approach.

Conclusion

Transnasal endoscopic management of mucoceles is preferred due to minimal trauma and less morbidity.

Keywords

Mucocele; Paranasal Sinus Diseases; Exophthalmos; Endoscopy

Frontal mucoceles are collections of inspissated mucus that occur when there is obstruction to the outflow of the frontal sinuses. The obstruction may be due to congenital anomalies, infection, trauma, allergy, neoplasms or surgical procedures in the nose.[1] With continued secretion and accumulation of mucus, the increasing pressure causes atrophy or erosion of the bone of the sinus, allowing the mucocele to expand in the path of least resistance. This may be into the orbit, adjacent sinuses and nasal cavity or through the skin. The mass may remain a simple mucocele containing mucus, or it may become secondarily infected, forming a pyocele.

Frontal mucoceles may present with ophthalmic disturbances. They can encroach on the orbit with ocular displacement and proptosis. They are a common cause of long-standing unilateral proptosis. Computerised tomographic scan (CT) has proven to be an excellent diagnostic tool and is essential in surgical planning.[2] Magnetic resonance imaging (MRI) may provide additional information in the examination of the orbit and may be preferred imaging technique if other soft tissue tumours causing proptosis cannot be excluded. Differential diagnosis includes paranasal sinus carcinoma, Aspergillus infection, chronic infection or inverting papilloma. Endoscopic marsupialization of frontal sinus mucoceles was reported for the first time by Kennedy et al. in 1989. The most common treatment modality is extirpation of the mucocele, cranialization or exclusion of sinus and nasofrontal duct obliteration.[3]

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.[1,4-7]

The purpose of the present study was to report a case of frontoethmoidal mucocele with orbital extension, treated with endonasal endoscopic surgery and to review the literature.

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Fig. 1. Patient with proptosis of his right eye and displacement of the globe inferiorly

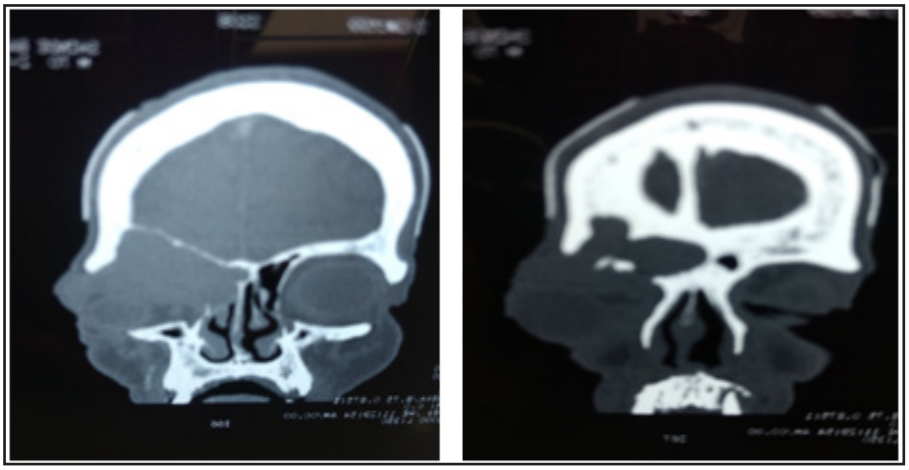

Fig. 2. CT shows non-enhancing soft tissue density lesion involving right frontal and ethmoid sinuses

Case Report

A 70 years old male patient presented to our OPD with complaints of redness of right eye, watering and pain in right eye since 7 to 8 months Also there was proptosis and no vision at all since 3 months. Patient was non-diabetic and non-hypertensive. There was no history of previous nasal surgery or head trauma. Bilateral cataract surgeries were done 15 years back. Examination of ear, nose and throat revealed no abnormality. Ophthalmic examination showed bullous keratopathy in the right eye with severe axial proptosis with no perception of light. Conjunctiva was congested and cornea was hazy. Eye movements were restricted in all directions. (Fig.1) CT orbit and PNS was done. It showed an ill defined non-enhancing soft tissue density lesion measuring 4.6x3.7x2.7 cm (APxTRxCC) involving right frontal and ethmoid sinuses. (Fig.2)

MRI revealed fairly large abnormal signal intensity lesion involving right frontal and anterior ethmoid sinuses indenting over right eye globe from posterosuperior and medial aspect displacing it downwards and laterally with resultant non-axial proptosis with no post contrast enhancement and no intracranial extension suggestive of frontoethmoid mucocele.

Patient was posted for endoscopic sinus surgery. We performed anterior ethmoidectomy and endonasal frontal sinusotomy on the right side via endoscopic approach, with drainage and marsupialization of the mucoceles. (Fig.3) Eye ball came to normal position immediately on table only. (Fig.4) Postoperative endoscopic exam (2 months) showed epithelialization of ethmoidal cavity, nasofrontal recess and frontal sinus and eyeball in normal position. (Fig.5)

Discussion

Mucoceles are mucous-secreting expansive pseudocystic formations, and capable of expansion by virtue of a dynamic process of bone resorption and new bone formation.[5] They result from obstruction of a sinus ostium and frequen¬tly are related to a previous condition as chronic sinusitis, trauma, surgery or expansible lesion. With continued secre¬tion and accumulation mucus, the increasing pressure causes atrophy or erosion of the bone of the sinus, allowing the mucocele to expand in the path of less resistance. Mucoceles are most commonly found in the frontal and ethmoidal sinuses, are infrequent in the sphenoid sinus and occur rarely in the maxillary sinuses.[6]

Proptosis is the most common presenting sign of a frontal mucocele, as in our case. Other clinical features include a mass in the upper medial quadrant of the orbit, pain, ver¬tical diplopia, limited upward gaze, bifrontal headache and increasing tearing.[7] Included in the differential diagnoses are dysthyroid eye disease,

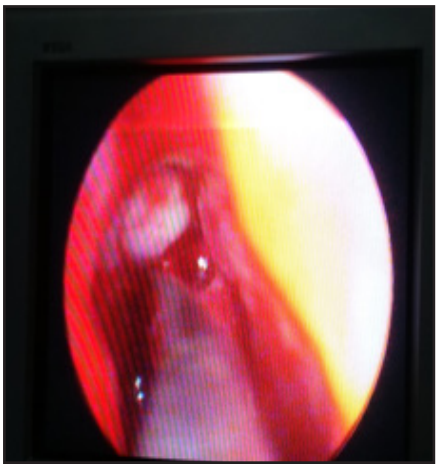

Fig. 3. Intraoperative image in normal position immediately

Fig. 4: Eyeball after drainage of mucocele

Fig. 5. Patient shows complete resolution of proptosis after surgical treatment.

retrobulbar orbital tumor, inflammatory pseudo tumor, sinus tumor, metastatic lesion and mucoceles of paranasal sinuses. Progressive unilateral painless proptosis of gradual onset should make one suspicious of a mucocele involving the paranasal sinuses, the frontal and ethmoid sinuses being the two most common locations. This is especially so, if there is accompanying diplopia, orbital or forehead pain and epiphora, which are frequently the presenting symptoms of mucoceles.

The symptoms are produced by pressure against the globe and mechanical interference with its motility. The proptosis is usually non-axial with the globe being displaced away from the site of the mucocele. There may be an associated history of sinus or nasal pathology or injury. The patient may occasionally complain of blurred vision and image distortion. Visual loss, field changes and optic atrophy are late manifestations which occur when the proptosis becomes marked. The cause of visual loss is varied. It may be due to direct compression of the optic nerve in the orbit, a vascular or inflammatory process involving the optic nerve refractive errors induced by the indentation on the globe, exposure keratopathy or secondary glaucoma.

The ophthalmic manifestations of patient is described are not uncommon presentations of frontal mucoceles. Other known complications of frontal mucoceles include erosion of the anterior wall, resulting in a tender fluctuant mass beneath the periosteum of the frontal bone. Erosion of the posterior wall may produce complications such as epidural abscess, meningitis, subdural empyema and brain abscess.

The classic radiographic appearance of a mucocele is generalised thinning and expansion of the sinus walls and there may also be evidence of sinus disease as well as bony erosions. The mucocele usually appears homogenous and airless. CT scan is much better in delineating the extent of the lesion and its relations to other surrounding structures.[8]

Contrast-enhanced MR imaging is useful in differentiating mucoceles from sinonasal tumours. Treatment of mucoceles is surgical and the access routes may be either external or endonasal.[6,9,10] External approach is made through frontoethmoidectomy (Lynch's procedure) or by osteoplastic flaps with or without frontal sinus obliteration and total excision of mucosa. For many years, these techniques were the only surgical alternative to treat frontoethmoidal mucoceles. They are aggressive procedures with high morbidity and currently they are reserved for extreme cases with significant intracranial or orbital extension.

The current tendency is to conduct functional, little invasive and low morbidity procedure with sinonasal endoscopic surgery, with marsupialization and abundant drainage of the lesion, preserving the epithelium.[11-14] The prognosis for frontal sinus mucoceles is good with likelihood of cure, and a low incidence of recurrence. Although, for control of recurrences, long-term followup is recommended.

Conclusion

Mucoceles are benign lesions of expansive characteristic that may cause severe complications at orbital and intracranial levels. Frontal mucoceles may occasionally present with ophthalmic manifestations such as proptosis. Being benign and curable, early recognition and management of mucoceles is of paramount importance. A high index of suspicion and appropriate radiological studies are necessary for the diagnosis of mucocele. Marsupialization with transnasal endoscopic evacuation proved to be a safe and efficient procedure in therapeutic approaches of frontoethmoidal mucoceles.

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