

Sudden Onset Proptosis: Frontal Sinus Mucocele Could Be a Cause

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Abstract

Proptosis is one of the commonest clinical manifestations of orbital pathology. Apart from orbital pathology, paranasal sinus mucocele could be a cause of progressive, unilateral, and gradual onset of proptosis. Herein, we discuss a case of sudden onset of non axial unilateral proptosis with diminution of vision. CECT showed heterogeneous enhancing mass lesions causing expansion and destruction of roof of the left orbit and inferomedial displacement of eyeball. Endoscopic sinus surgery was done under general anaesthesia, followed by reduction in proptosis and normalization of eyeball position

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Introduction

Proptosis is forward displacement of the eyeball beyond the orbital margin. It is one of the common manifestations of orbital pathology. It usually results from mass lesions, vascular anomaly, inflammatory process or endocrine lesions, but it could be an early and sometimes the only manifestation of nasal or paranasal sinus pathology¹ like mucoceles. Mucoceles account for 4–8.5% of expanding orbital lesions² with frontal and ethmoidal sinuses as the most common sites. Frontal mucoceles occur due to accumulation of inspissated mucus and desquamated epithelium, whenever there is obstruction to the outflow of the frontal sinuses.³ With continued secretion, accumulation of mucus and increasing pressure; it causes atrophy or erosion of the bone of the sinus, which allows the mucocele to expand in the path of least resistance like into the orbit, adjacent sinuses and nasal cavity. Frontal mucoceles are a common cause of long standing unilateral proptosis.⁴ Here, we are presenting a case of sudden onset of unilateral proptosis due to frontal sinus mucocele.

Case Report

A 45 year old female presented in ophthalmology OPD with chief complaints of sudden protrusion of the left eye since 6 days, associated with ocular pain and redness. There was no history of diplopia, ocular trauma or any significant past history. On clinical examination of the left eye, vision was 6/12, with non axial proptosis and displacement of the eyeball inferomedially (Figure 1). Pupillary reaction

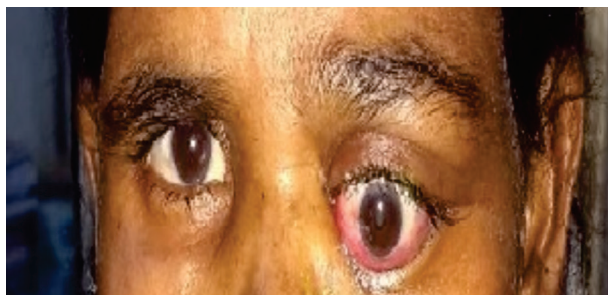


Figure 1: clinical photograph showing inferomedial displacement of eyeball with proptosis

was normal and extra ocular movements were restricted in all quadrants. On slit lamp examination, superficial punctate lesions were noted on the inferior half of cornea. On fundus examination, few choroidal folds were noticed in the superior quadrant, with rest of the fundus as normal. Intra ocular pressure was 12 mm Hg. B-scan USG showed indentation of globe from superiorly. On Contrast enhanced computed tomography (CECT), heterogeneous enhancing mass lesions noted, filling left frontal sinus measuring 4cm (Anteroposterior) x2.6cm (Transverse) x3.1cm (Craniocaudal), causing expansion and destruction of the roof of left orbit and extending into the orbit causing inferomedial displacement of the eyeball (Figure 2).

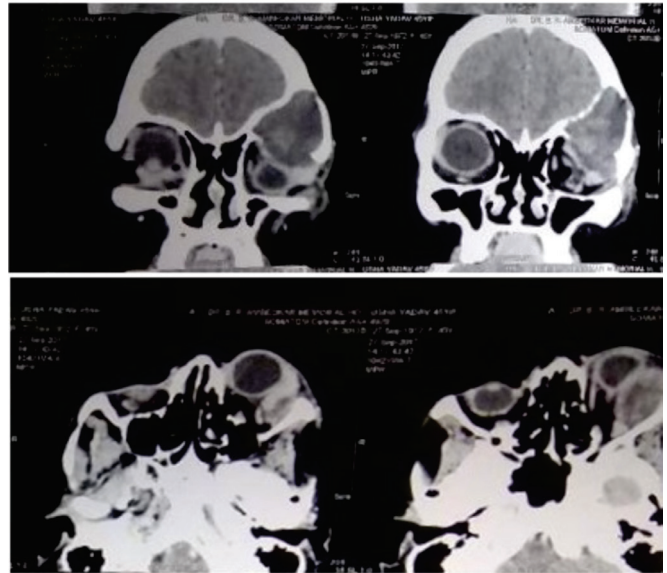


Figure 2: CT images showing inferomedial displacement of the eyeball by frontal mucocele

Magnetic resonance imaging (MRI) of the central part of lesion showed hyperintensity on T1 and hypointensity on T2 with no obvious enhancement suggestive of inspissated secretion. Peripheral part was appearing hypointense on T1 and hyperintense on T2, with peripheral enhancement suggestive of fluid component. The patient was referred to an Otolaryngologist who did nasal endoscopy and found

a smooth bulge on anterior and superior aspects of middle turbinate, rest of the findings were normal. Endoscopic sinus surgery (ESS) was planned and ESS assisted frontal sinus marsupialization was done under general anaesthesia. After that, on the table, orbit examination was performed which showed reduction in the size of proptosis. Post operatively, the eyeball returned to its normal position with no proptosis and regained extra ocular movements (Figure 3).



Figure 3: Postoperative photograph showing reduction in proptosis and normal placement of eyeball

Discussion

Progressive unilateral painless gradual onset of proptosis poses a clinical diagnostic challenge to ophthalmologists. After excluding differential diagnosis one should make suspicion of a mucoceles involving the paranasal sinuses. The proptosis is usually non-axial with the globe being displaced away from the site of the mucocele. Fluctuation in the amount of proptosis may be seen when the patient develops a common cold or has inflamed sinuses.⁴ Mucoceles may be presented with symptoms like diplopia, orbital or forehead pain, epiphora, blurring of vision and image distortion. Visual loss, field changes⁵ and optic atrophy⁶ are late manifestations which occur when the proptosis becomes marked. The cause of visual loss may be due to direct compression of the optic nerve in the orbit,⁷ a vascular or inflammatory process involving the optic nerve,⁷⁻⁹ refractive errors induced by the indentation on the globe, exposure keratopathy or secondary glaucoma. Frontal sinus mucoceles develop secondary to a blockage of the nasofrontal duct, as a result of infection, trauma, tumors, congenitally narrowed ostium, allergies or previous sinus surgery.¹⁰ It is now proposed that infection of frontal sinus following obstruction of frontal recess leads to stimulation of lymphocytes and monocytes leading to production of cytokines by the lining fibroblasts which in turn promote bone reabsorption and mucocele expansion.¹¹ The diagnosis of mucocele is made on the basis of symptoms, imaging and surgical exploration and histological confirmation. High-resolution CT scan will show homogenous lesions, which are isodense with brain and no contrast enhancement, unless infected. There are clear cut margins of bone erosions occurring in the sinus walls. In malignancy, the mass is likely to be irregular in shape, with erosion and destruction of sinus walls. In sinusitis or retention cyst, there is no bone destruction.¹² Magnetic resonance imaging (MRI) is useful when the diagnosis is uncertain and it is necessary to differentiate between different types of soft tissues within the sinonasal cavities especially if mucocele is formed

secondary to neoplasm.

Treatment of mucocele is surgical and goals of surgery are eradication of the mucocele with minimal morbidity and prevention of recurrence. Surgical approaches could involve an external approach (Lynch Howarth fronto ethmoidectomy) or osteoplastic flap with sinus cavity obliteration. Endoscopic drainage has been advocated so as to allow preservation of the frontal sinus mucosa and maintenance of a patent frontal recess.¹³ HarEl G,¹⁴ in their study of 103 patients with 108 paranasal sinus mucoceles (66 frontal/ fronto ethmoid) treated with wide endoscopic marsupialisation found a very low recurrence rate 0.9 % (1 case) after a mean follow up of 4.6 years. External approach is used in cases where the anatomical extent of the disease or previous surgery restricts visualization and access to the frontal sinus.

Conclusion

Frontal mucocele can be one of the causes for sudden onset unilateral proptosis, when there is encroachment of lesion into the orbit through bone erosion or preformed pathways. Proper ocular examination and advanced investigation like CECT and MRI aid in early diagnosis of frontal mucocele. CT scan assessment of lesion provides useful information regarding site and extend of lesion. Endoscopic sinus surgery should be considered as a treatment option for paranasal sinus mucocele with orbital involvement. Marsupialization of the mucocele into the nose is effective in improving ophthalmic symptoms and signs due to mucoceles, although longer term follow-up is required to fully evaluate outcomes.

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