

## POST-TRAUMATIC FRONTAL SWELLING WITH PROPTOSIS AND DIPLOPIA

Sabari R<sup>1</sup>, Singh SP<sup>2</sup>, Reddy N<sup>3</sup>

### ABSTRACT

Craniorofacial trauma often manifests itself as a multisystem injury in 20-50% of the cases. Midface and zygomatic bone fractures are the most common occurring together in developing countries due to inadequate road traffic legislations while mandible fractures are common due to its most predominant position in face and also due to interpersonal conflicts/assaults. Neurosurgeons and oral & maxillofacial surgeons play a very vital role along with neurologists and ophthalmologists in managing a craniorofacial trauma patient. The emergency physicians must have the expertise to manage the situation and stabilize a patient with severe traumatic injuries of craniorofacial region.

**Key words:**Paranasal sinus, Visual loss, Proptosis.

**How to cite this Article:**Sabari R,Singh SP, Reddy N,Post Traumatic Frontal Swelling with Propoptosis and Diplopia.Arch CranOroFac Sc 2013;1(1):1-5

**Source of Support:** Nil

**Conflict of Interest:**No

### Introduction

Frontal mucoceles are collections of inspissated mucus which occur when there is obstruction to the outflow of the frontal sinuses[1]. The obstruction may be due to congenital anomalies, infection, trauma, allergy, neoplasms or surgical procedures in the nose[2,3]. 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



[www.acofs.com](http://www.acofs.com)

Use the QR Code scanner to access this article online in our database

Article Code: ACOFS001

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[4]. Ocular motility disturbance, lid distortion, and periocular pain is other important presentations. Patient with frontal sinus mucoceles presenting with proptosis, diplopia and epiphora are presented in this case report.

### Case Report

A 36-year-old Indian man presented with progressive painless proptosis of the right eye for two years [Figure. 1]. He had history of traumatic injury at frontal region at left side 16 years back with small swelling on same region. He also complained of diplopia and epiphora since 2 months in left eye. The left globe was proptosed by 4 mm compared to the fel-

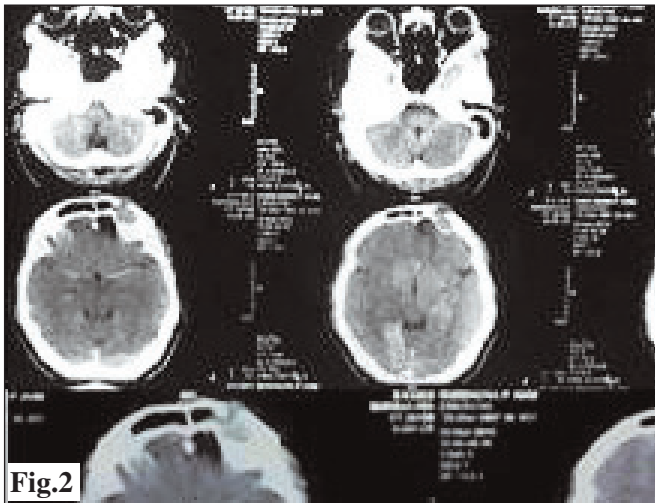


Fig.2

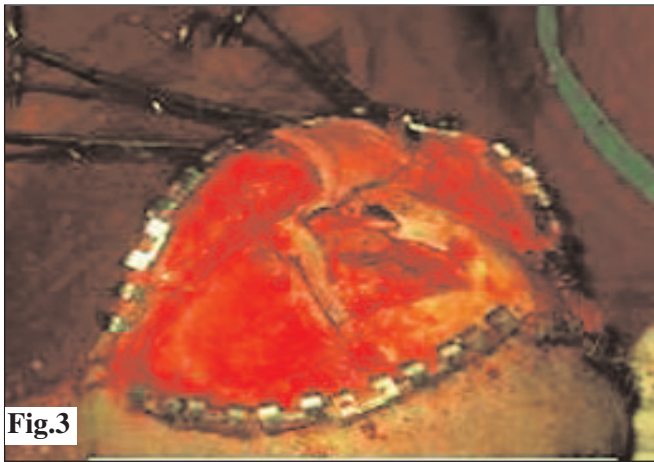


Fig.3

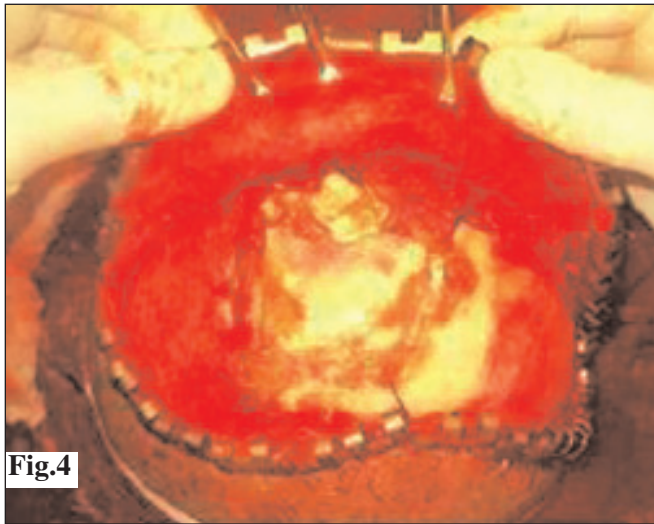


Fig.4

low eye and was displaced 3 mm inferiorly and temporally. It was firm to retropulsion. The ocular motility of his left eye was restricted in upgaze and horizontal gaze, with diplopia in all positions of gaze. The pupils were equal and reactive. The optic discs were not swollen but the cup-disc ratio was 0.5 in the right

and 0.3 in the left. Fundoscopy showed choroidal elevation superiorly, with choroidal folds over the macula in the right eye. The right fundus was normal. Orbital ultrasonography revealed a retrobulbar cystic mass arising superiorly, indenting the posterosuperior aspect of the left globe. Computerized tomography scan (CT) showed a right intraorbital extraconal iso-dense mass causing gross downward and outward displacement of the globe [Figure. 2]. A magnetic resonance imaging (MRI) of the orbit was suggested to better define the lesion. MRI showed that the mass was a mucocele arising from the frontal sinus causing inferior displacement of the orbital roof resulting in proptosis. The patient underwent left fronto-ethmoidectomy with frontal sinus reconstruction by mucosa and muscular patch with evacuation of the mucocele and reconstruction of orbital roof. Intraoperative mucocele was completely extradural and invaded into orbital roof and extended upto retro orbital region on left side [Figure.3 and 4]. Postoperatively at six months, there was complete resolution of the proptosis and the patient was asymptomatic.

### Discussion

A gradual onset of unilateral proptosis poses a clinical diagnostic challenge included in the differential diagnoses are eye disease, retrobulbar orbital tumour, inflammatory pseudo tumour, sinus tumour, metastatic lesion and mucoceles of the 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[4-8]. 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. The amount of proptosis may fluctuate when the patient develops a common cold or has inflamed sinuses[4].

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[9] and optic atrophy[10] 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[6] ,a vascular or inflammatory process involving the optic nerve[6,11,12] refractive errors induced by the indentation on the globe, exposure keratopathy or secondary glaucoma. The ophthalmic manifestations of the patient described are not uncommon presentations of frontal mucoceles. Patient presented with painless, non-axial proptosis with restriction of ocular movements and diplopia as well. There was also the possibility of optic nerve involvement causing deterioration of visual acuity and colour vision as in the patient. 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[5]. Erosion of the posterior wall may produce complications such as epidural abscess, meningitis, subdural empyema and brain abscess. Rarely, cranial nerve palsies may also occur[13]. The classic radiographic appearance of a mucocele is generalized 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 homogeneous and airless. Although plain radiographs do reveal the lesion, CT scans are much better in delineating the extent of the lesion and its relations to other surrounding structures. They can differentiate the high attenuated regions of mucus from the surrounding

mucosa which appears as a region of low attenuation. The extent of bone destruction is also better appreciated on CT. MRI is able to show mucoceles but it can sometimes be misleading because inspissated mucus within the sinus may be mistaken for an aerated cavity[14]. With MRI, there is also a lack of contrast between the cortical bone margins of the orbit and adjacent air in the sinuses, making evaluation of the orbital walls difficult. In general, if the clinical features are highly suggestive of a sinus mucocele as the cause of proptosis, a CT scan of the orbit may be the first imaging choice. However, MRI may provide additional information in the examination of the orbit and may be the preferred imaging technique if other soft tissue tumours causing proptosis cannot be excluded. Orbital ultrasonography is another useful imaging tool as it helps to determine whether the lesion is a cystic or a solid mass. The definitive treatment of mucoceles is primarily surgical. The aim of surgical management is to reestablish adequate drainage of the sinus without producing cosmetic or functional deformity. In addition, the lining of the cyst may be removed and the sinus obliterated with soft tissue like abdominal fat. This can be accomplished by an lesion is a cystic or a solid mass external open obliterative procedure or the more cosmetically appealing osteoplastic flap technique[2,15-18]. Prompt surgical therapy is needed to achieve good surgical outcome.

### **Conclusion**

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. Open surgical and Transnasal endoscopic evacuation are viable

surgical option to solve this problem.

## REFERENCES

1. Nugent G R, Sprinkle P, Byron M. Sphenoid sinus mucoceles. *J Neurosurg* 1970; 32:443-51.
2. Stiernberg C M, Bailey B J, Calhoun K H, Quinn F B. Management of invasive frontoethmoidal sinus mucoceles. *Arch Otolaryngol Head Neck Surg* 1986; 112:1060-3.
3. Diaz F, Latchow R, Duvall A J 3rd, Quick C A, Erickson D L. Mucoceles with intracranial and extracranial extensions. *J Neurosurg* 1978; 48:284-8.
4. Alberti P W, Marshall H F, Black J I. Fronto-ethmoidal mucocele as the cause of unilateral proptosis. *Br J Ophthalmol* 1968; 52:833-8.
5. Abrahamson I A, Baluyot S T, Tew J M, Scioville G. Frontal sinus mucocele. *Ann Ophthalmol* 1979; 2:173-8.
6. Avery G, Tang R A, Close G C. Ophthalmic manifestations of mucoceles. *Ann Ophthalmol* 1983; 15:734-7.
7. Natvig K, Larsen T E. Mucocele of the paranasal sinuses: retrospective clinical and histological study. *J Laryngol Otol* 1978; 92:1075-82.
8. Kaufman S J. Orbital mucopyoceles. Two cases and a review. *Surv Ophthalmol* 1981; 25:253-62.
9. Fazakas A. A contribution to the symptomatology of a mucocele in ophthalmology. *Ophthalmologica* 1953; 25:175-82.
10. Mortada A. Radiography in mucocele of the frontal sinus. *Am J Ophthalmol* 1967; 64:1162-7.
11. Imachi J. Rhinogenous retrobulbar neuritis: Pathogenic problems and case reports. *Neuro-ophthalmol* 1981; 1:273-80.
12. Fujitani T, Takahashi T, Asai T. Optic nerve disturbance caused by frontal and frontoethmoidal mucopyoceles. *Arch Otolaryngol* 1984; 110:267-9.
13. Ehrenpreis S J, Biedlingmaier J F. Isolated third nerve palsy associated with frontal sinus mucocele. *Neuro-ophthalmol* 1995; 15:105-8.
14. Toriumi D M, Sykes J M, Russell E J, Morganstein S A. Sphenoethmoidal mucocele with intracranial extension: Radiologic diagnosis. *Otolaryngol Head Neck Surg* 1988; 98:254-7.
15. Chandler J R Jr. Mucoceles: Their diagnosis and treatment. *J Fla Med Assoc* 1960; 46:825-31.
16. Goodale R L, Montgomery W W. Experiences with osteoplastic anterior wall approach to frontal sinus. *Arch Otolaryngol* 1958; 68:271-83.
17. Iliff C E. Mucoceles in the orbit. *Arch Ophthalmol* 1973; 89:392-5.
18. Gross W E, Gross C W, Becker D, Moore D, Phillips D. Modified transnasal endoscopic Lothrop procedure as an alternative to frontal sinus obliteration. *Otolaryngol Head Neck Surg* 1995; 113:427-34.

## Authors

1. Reza Saberi MD  
Registrar, Dept. of Neurosurgery  
Kashan University of Medical Sciences, UK
2. Singh S.P MCh  
Senior Registrar  
Dept. of Neurosurgery,  
Bhopal ,M.P. India

3. Reddy N, MD

Junior Resident,

Department of Radiology, NMCH,

Andhra Pradesh, India

**Correspondence Address**

Reza Saberi MD

Registrar, Dept of Neurosurgery

Kashan university, UK

Email – [saberi@yahoo.co.in](mailto:saberi@yahoo.co.in)