Frontal Mucocele causing Unilateral Proptosis

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Case Report

A 51 year old male, presented with a sudden increase in proptosis left eye. Patient had history of proptosis for the past 13 years, which increased to about double the preexisting size over the past three days. He also complained of diplopia on vertical gaze for the past three days and unilateral left sided headache with slight peri-orbital pain for two days. Patient is a case of autosomal dominant polycystic kidney disease with chronic renal disease with features of end stage renal disease on alternate day hemodialysis. He had past history of hypertension and an episode of cerebrovascular accident (CVA) 15 years ago.

On examination patient was found to be hypertensive with a BP of 170/100 mmHg with no residual effects of CVA. Ophthalmologic examination showed proptosis left eye (Fig. 1) which was non-pulsatile with chemosis and edema left upper eyelid. The globe appeared pushed downwards and forwards. His visual acuity and eyeball movements were normal and there was no papilledema. The right eye was essentially normal. ENT examination including a diagnostic nasal endoscopy was essentially normal.

Contrast enhanced computed tomography (CECT) of paranasal sinuses (PNS) was done which showed an expansile soft tissue mass of left frontal sinus eroding orbital roof and extending to orbit with no contrast enhancement (Fig. 2). A provisional diagnosis of left frontal mucocele was made.

Surgical decompression by left external frontoethmoidectomy with orbital decompression was planned. Using a left sided Lynch Howarth approach, periosteum was incised and retracted. The lacrimal crest was identified. Left frontal sinus was opened and drilled out. The frontal mucocele was exposed, dissected out and excised completely and found to contain straw colored fluid which was sent for culture. A dehiscence was seen in the floor of frontal sinus going into orbit. Orbital decompression was done by removing medial wall of orbit (part of frontal process of maxilla). A stent was placed in left frontal sinus through the frontonasal recess opening into the middle meatus by making a separate incision intranasally with the help of a 0° nasal endoscope. Two drains were placed one through the external incision into the wound and one through the wound going out through the intranasal

incision. An external tarsorrhaphy of the left eye was done. His postoperative recovery was uneventful.

Culture of the aspirated fluid showed no microorganisms or fungi. Histopathological examination was suggestive of a mucocele. Follow up after six weeks showed that the proptosis had reduced considerably (Fig. 3).

Discussion

A mucocele is an epithelial lined mucus containing sac completely filling the sinus and is capable of expansion. All paranasal sinuses can develop a mucocele with the frontal and ethmoidal sinuses being the ones most commonly affected. The development of mucocele is relatively uncommon and rarely bilateral and highest incidence of occurrence is in the age group between 40 to 70 years. Expansion of mucocele may take place over many years or can occur rapidly when infection produces a pyocele.

Frontal sinus mucoceles develop secondary to a blockage of the nasofrontal duct, as a result of infection, trauma, tumors, congenitally narrowed sinus, allergies or previous sinus surgery [1]. Earlier mucocele was thought of as a retention cyst due to cystic degeneration of seromucinous gland. 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 [2]. Since mucocele expands in the direction of least resistance, frontal mucocele tends to erode the thin bone of the superior orbital wall extending into the orbit and displacing the globe inferiorly. Majority present with ocular symptoms such as diplopia, ptosis, proptosis and epiphora due to displacement of globe.

The visual acuity of the patients is usually not affected unless there is compression of the optic nerve by the mass effect of the mucocele. However conversion of mucocele to a pyocele due to infection can lead to rapid expansion leading to visual compromise and requires

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Fig. 1 : Figure showing proptosis of left eye

Fig. 2 : CECT PNS showing an expansile soft tissue mass of left frontal sinus extending to orbit

emergency management.

In the diagnosis of a mucocoele CT scan is the preferred mode of imaging which shows a homogenous smooth walled mass expanding the sinus with thinning or loss of translucence. 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 mucocoele is formed secondary to neoplasm.

Culture of the aspirated mucocoele contents can sometimes confirm the presence of infection [3]. The isolates found generally were staphylococcus aureus, alpha hemolytic streptococci, haemophilus species, gram negative bacilli and predominant anaerobes like propionibacterium and peptostreptococcus.

Treatment of mucocoele is surgical. The goals of surgery are eradication of the mucocoele with minimal morbidity and prevention of recurrence. Surgical approaches are based on the size, location and extent of the mucocoele. Surgical approaches could involve an external approach (Lynch Howarth fronto

Fig. 3 : Followup photograph showing reduction in proptosis

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 [4]. Har-EI G [5], in their study of 103 patients with 108 paranasal sinus mucocoeles (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. Khong et al [6], in their study of 41 patients with mucocoeles found that the long term results of modified endoscopic Lothrop procedure and endoscopic marsupilisation were similar. External approach has is used in cases where the anatomical extent of the disease or previous surgery restricts visualization and access to the frontal sinus.

Our patient presented with unilateral proptosis left. In our case secondary infection of the mucocoele was the most probable cause of rapid increase in mucocoele size even though the culture was negative. An external approach for surgery was used because the mucocoele was eroding into the orbit.

Conflicts of Interest

None identified

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