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Giant Frontal Mucocele

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Abstract

***Introduction*:** Mucocele is a epithelium lined mucous containing sac that usually develops following blockage of ostium of paranasal sinuses. Giant frontal mucoceles are relatively rare and they may haveorbital, extra cranial and anterior cranial fossa extension

***Material and methods*:** All cases of frontal mucoceles reported to neurosurgery in last 10 years were reviewed and only those having swelling at forehead were taken in our study. All such giant mucoceles were analysed in respect of size, bone involvement, age and symptoms.

***Results*:** We are presenting a series of 17 cases of giant frontal mucoceles admitted over a period of 10 years in our university hospital highlighting the clinical features, radiological findings of this uncommon condition.

Conclusion: The frontal mucocele is common but its giant variant is relatively not usually seen in modern era. The diagnosis is easy. The investigation of choice is CT scan with 3-D reconstruction. Treatment strategy is exentration of mucous membrane followed by bone cement cranioplasty.

***Keywords*:**Giant frontal mucocele, Paranasal sinus mucocele,

Introduction

Mucocele is an epithelium lined mucous containing sac that usually develops following blockage of ostium of paranasal sinuses. Mucoceles of paranasal sinuses are most commonly seen in frontal sinus followed by ethmoidal sinus [1]. Mucoceles erode bone and invade adjoining intraorbital and intracranial cavity. Giant frontal mucoceles are rare [4-12] and they haveorbital, extra cranial and anterior cranial fossa extension [1-3]

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Patients and Methods

All cases of frontal mucocele with obvious swelling on forehead reported to neurosurgery in last 10 years were taken into study. They were analysed in respect to age, sex, symptoms, radiology and management. Their incidence, aetiology and treatment protocol were discussed.

Table 1. Incidence

Age (years)	Sex	Incidence
0-20	Male	2
	Female	3
21-40	Male	7
	Female	2
41-60	Male	3
	Female	0

Results

We encountered 17 cases of giant frontal mucocele with obvious swelling on the forehead. The maximum incidence (9 cases) were found in the age group 21-40 while 5 and 3 patients were belonged to age group of 0-20 years & 40 -60 years (Table1).

There is male predominance with ratio of 2.4 versus 1. Out of 4 patients with size < 3 cm one presented with epilepsy, while the remaining presented with frontal headaches. One patient had bony involvement. All six patients with size 3-6 cm had frontal headache as their presenting symptom (Fig.1).

Table 2.Clinical association

Supraorbital swelling size (in cm)	Incidence	Bony involvement (Other than anterior wall)	Symptoms
<3cm	4	1	Epilepsy (1),frontal headache(4)
3-6 cm	6	4	Frontal headache, diplopia (2), proptosis (2),meningitis(1)
>6 cm	7	7	Asmptomatic except swelling(2),diplopia (2) Frontal headache(5), proptosis (2), meningitis(1)

Fig.1: Giant frontal mucocle presenting as a large subcutaneous swelling

Diplopia and proptosis were seen in 2 patients whereas meningitis occurred in one patient (Table 2).The four patients had bony involvement while two had complete destruction of the superior orbital wall. Two patients with swelling > 6 cm was asymptomatic (Fig.2).

Five patients (29.4%) presented with frontal headache, with 2 patient having proptosis and diplopia. One patient presented with meningitis. All 7 patients in this group had bony involvement with 4 patients having complete destruction of the superior orbital wall and one patient having posterior frontal sinus wall completely destroyed with the swelling directly abutting the dura.

Radiology

All patients were radiologically surveyed by plain skiagram and helical CT scan with 3D reconstruction to define the limit of bony

Figure 2: Giant frontal mucocele in a 60 years male

Fig.3: CT scan axial sectionof giant left frontal mucocele

Fig.4: CT scan (a) sagittal section and (b) 3 D view reconstruction showing bony defect of giant left frontal mucocele.

destruction (Fig.3-6). Four patients had superior orbital margin involvement while the posterior boundary was lost in one.

Treatment

All patients were operated upon through supraorbital orbital route followed by aspiration for bacterial analysis and exenteration of mucosal lining. The bony prominent edges were drilled out. The cranioplasty was done in 10 cases in second stage surgery while ten refused for cosmetic correction and accepted the mild depression. The recurrence was not observed in any case.

Table 3. Computed Tomographic finding in giant frontal mucocele

Anatomical site	Radiological Finding	Number of cases
Status of wall		
Anterior	Destroyed	17
Posterior	Destroyed	6
Orbital	Destroyed	8
Attenuation value of content	0-5	2
	6-10	11
	11-15	4
Frontal Bone	Size of defect of anterior wall in 3-D	
	Less than 5cm	10
	More than 5 cm	7

Discussion

Frontal mucoceles are the most common (65%) among the paranasal sinus mucoceles [1]. The continuous or intermittent obstruction of the sinus ostium causes dilatation of the sinus cavity secondary to accumulation of mucoid material [2]. Histopathology shows a hyperplastic mucosa with metaplasia and peripheral

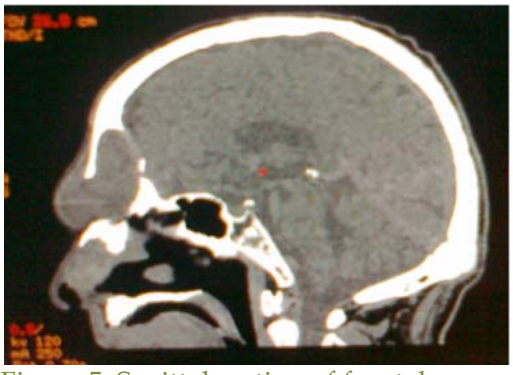

Figure 5: Sagittal section of frontal mucocele

fibrous reaction [14]. Fibroblasts lining the mucocele produce interleukins and collagenase which leads to bone erosion [15,16]. Frontal mucoceles can present with a decreased visual acuity, visual field abnormalities, proptosis, ptosis, periorbital swelling, displacement of the globe, restricted ocular movements or as asymptomatic subcutaneous swelling [15,16]. Frontal mucoceles tend to erode the thin bone of the superior orbital wall, invading the orbital cavity and displacing the globe inferiorly resulting in diplopia [18]. Direct compression of the optic nerve by the mucocele is rare so patient's visual acuity is usually not affected [18].The mucocele can erode the posterior frontal sinus wall and invade into anterior cranial fossa. CT is the preferred mode of imaging for paranasal sinus pathology as mucocele causes bony involvement [19] .MRI is useful in

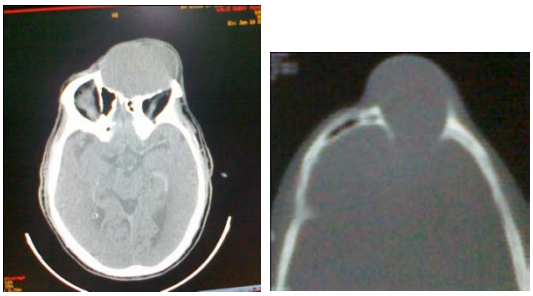

Figure 6: CT scan (a) axial cut brain and (b) bone window: a giant right frontal mucocele

complicated cases with intracranial extension or infection. Sinus mucocele in CT is depicted as a non-enhancing, low attenuation expansile mass usually isodense to brain, depending on the water content of the mucus. To the best of our knowledge, only three patients presenting with complaint of a frontal mucocele with intracranial extension with subcutaneous swelling have been reported so far [20,21].

Conclusion

The giant frontal mucocele is uncommon complication of sinusitis and usually affect middle aged male community. The presentation is obvious swelling, headache, proptosis. The diagnostic investigation is spiral computed scan. Surgery is ideal mode of treatment with excision and cranioplasty with almost no recurrence.

Conflict of interest

The authors declare that there are no conflicts of interests.

Author's Contribution

VS: Concept and design of study, final approval

DPT: Analysis of cases, literature search and preparation of final manuscript

KS: Concept of study

DP: Addition of recent cases and prelimary preparation of article

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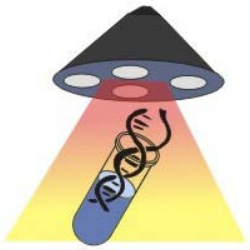

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