A pathologist’s perspective on mucocele of frontal sinus – a case report

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ABSTRACT

We report a case of frontal paranasal sinus mucocele in a 30 year old female who presented with complaints of left supra orbital mass since 15 days associated with tenderness. CT scan revealed minimally enhancing expansile cystic lesion with patchy ground glass attenuation involving roof of left orbit and posterior wall of frontal sinus with fibrous dysplasia. Endoscopic marsupialisation of the mucocele was performed and specimen was sent to histopathology department. Based on the clinical, radiological and histopathological examination, the diagnosis of frontal paranasal sinus mucocele was concluded and literature reviewed. **Aim:** we here by present this case considering its rarity and to study the literature associated with it.

Key words: Mucocele, Paranasal sinus, fibrous dysplasia, supra orbital mass, cytokines

INTRODUCTION

A mucocele is an epithelial lined mucus containing sac completely filling the sinus and capable of expansion. It can affect the general population but mostly from 4th to 7th decade of life. They present with soft, bluish and transparent cystic swelling. 1 Paranasal sinus mucocele were first described by Langeback in 1820. Rollet in early 1990s gave the name ‘mucocele.’ It is rare, slow growing, benign intracranial pathology. A mucocele is formed by obstruction of sinus ostium or a compartment of separated sinus, this cause the cavity to be filled with mucus or become airless. The lesion has a multifactorial etiology involving anatomic abnormality, inflammation, trauma, allergy, previous surgery, fibrous dysplasia, ossifying fibroma, osteoma, etc. 2 Since the frontal, ethmoid, sphenoidal and maxillary sinus anatomically interface the orbit, hence they can easily cause ophthalmic manifestations like proptosis, blurring of vision, orbital displacement, headache, etc. Sometimes it can also lead to intracranial complications. 2 Fronto ethmoidal mucocele is the most common, while sphenoid mucocele being the least common. 1, 3 The fronto ethmoidal mucocele often presents with an outward and downward displacement of the orbital globe, fronto ethmoid swelling, visual impairment, and headache. 4 Though mucocele can be diagnosed on CT scan and MRI. It is important to distinguish mucocele from the mucus retention cyst which is a sac filled with fluid along the sinus lining which does not expand or push into the surrounding and therefore does not cause problem in most cases. 5 Mainstay of management is surgery ranging from functional endoscopic sinus surgery to craniotomy, craniofacial exposure with or without obliteration of sinus. 6

CASE HISTORY:

30 year old female presented in ophthalmology OPD with a left supra orbital mass since 15 days (mass size- 2 x 3 cm), clinically the mass appeared to be cystic on palpation and was tender. No complaints of any visual disturbance or headache etc. The CT scan revealed a well-defined minimally enhancing expansile cystic lesion with patchy ground glass attenuation involving roof of left orbit and posterior wall of frontal sinus with fibrous dysplasia. MRI brain and orbit also showed similar findings as of CT scan. Based on these the differential diagnosis of- fibrous dysplasia, Aneurysmal bone cyst and mucocele of left frontal sinus were given. Surgery was performed and specimen was sent to histopathology section of our pathology department.

Histopathological features: Gross specimen showed multiple fragmented grey brown tissue bits altogether measuring 3 x2 cm.

Microscopy: Sections studied through all processed tissue bits shows epithelial lining of
the sinus with cystically dilated spaces filled with mucin. Based on these findings, diagnosis of mucocele-frontal sinus was given.

**Figure 1: H & E Section, 10 x view of mucocele showing epithelial lining of sinus, cartilage with few cystically dialated spaces**

**DISCUSSION**

Majority of paranasal sinus mucocele present at the age of 40-70yrs. Our case was seen in slightly younger age group.  

1. Paranasal sinus mucocele occur in fronto ethmoid region (64%), maxillary sinus (18.6%), sphenoidal sinus (8.4%) and posterior ethmoid sinus (6.7%), sphenoid (1%). In our case, the frontal sinus was involved.  

Fronto ethmoidal mucocele are the most common as a result of complexity of its drainage.  

The natural development of sinus mucocele is of gradual expansion and therefore can invade into the vital structures in the surrounding like other sinuses, orbit, clivus, brain and skull and cause intra orbital (proptosis, blurring of vision, displacement of globe, ocular palsy) and intra cranial complications (meningitis, subdural and brain abscess.

Theories of pressure erosion, cystic degeneration of glandular tissue and active bone resorption and regeneration are implicated in the pathogenesis of mucocele. Bone resorbing factors like leukotrienes, PGE 2, HETES, cytokines, interleukines, TNF α, E-selectin, I-CAM and vascular adhesion molecule are found in the mucosa of mucocele. Normally, new bone formation is balanced by osteolysis. In mucocele, the balance is just tipped in favour of osteolysis facilitating expansion of lesion.  

Various treatment options are available depending upon the degree of extension ranging from functional endoscopic sinus surgery to external approach, craniotomy, craniofacial exposure with or without obliteration of sinus.  

It is essential to differentiate mucocele from the mucus retention cyst. It is a fluid filled sac with a sinus lining but it cannot expand as does the mucocele. In the differentials one must also rule out mucopyocele, meningioma, craniopharyngioma, hypophyseal tumours, optic nerve glioma, intracranial chondroma, neoplastic lesions of nasopharynx, sinus malignancy.

**CONCLUSION**

Symptoms of the currently reported case are quite vague i.e. supra orbital mass and tenderness since 15 days. Pre-operative diagnosis was based on CT and MRI. The frontal mucoceles are the commonest amongst various paranasal sinus mucoceles and may have a variable presentation. Rarely a supraorbital soft tissue mass may be the presentation as in our case. Through proper clinical examination, timely and accurate histopathological examination play an important role in differentiating this lesion from the other sinus related conditions and prevents the untoward complications.

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**REFERENCES**

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