

An Unusual Presentation of a Giant Frontal Sinus Mucocele Manifesting with a Subcutaneous Forehead Mass

CSH Tan,¹MBBS, M Med (Ophth), MRCSEd, VKY Yong,¹MBBS, FRCSEd, LW Yip,¹MBBS, M Med (Ophth), MRCSEd, S Amrith,^{1,2}MD (Ophth) (AIIMS), DO, FRCSEd

Abstract

Introduction: To describe the unusual manifestation of a giant frontal sinus mucocele. **Clinical Picture:** A 33-year-old female presented with blurring of vision in the left eye, periorbital swelling and a painless forehead mass. There was proptosis, partial ptosis, and an elongated, soft, subcutaneous mass over the left side of the forehead. CT scan showed a mass arising from the frontal sinus with both intraorbital and intracranial extension. **Treatment:** Surgical excision of the mass confirmed the diagnosis of a mucocele. **Outcome:** Postoperatively, the patient was asymptomatic. **Conclusions:** A subcutaneous soft-tissue mass may be the presenting complaint of a frontal mucocele. Careful examination of the surrounding skin may suggest the diagnosis of sinus-related disease and thus direct appropriate investigations.

Ann Acad Med Singapore 2005;34:397-8

Key words: Choroidal folds, Exophthalmos, Intracranial extension, Mucocele, Subcutaneous tissue

Introduction

A mucocele is an epithelium-lined mucus-containing sac which usually develops when the ostium of a paranasal sinus becomes obstructed by chronic sinusitis, polyps or bone tumours. Mucoceles can erode through the surrounding bone and spread both intraorbitally and intracranially.¹⁻⁴ We report an unusual case of a patient with intracranial extension of a frontal sinus mucocele who presented with a subcutaneous forehead mass.

Case Report

A 33-year-old female presented with blurring of the inferior visual field in the left eye, associated with periorbital swelling and a painless subcutaneous forehead mass above the affected eye. There was no history of surgery or trauma, and she did not experience symptoms suggestive of raised intracranial pressure or thyrotoxicosis.

Visual acuity was 20/20 on the right and 20/30 on the left and there was no relative afferent pupillary defect (RAPD). Clinical examination of the left eye revealed proptosis, periorbital swelling, partial ptosis, restricted elevation and abduction, and diplopia on left gaze. Choroidal folds were present on the superior half of the macula, but there was no optic disc oedema. No focal orbital masses were palpable

and cranial nerve examination was normal. An elongated, soft, subcutaneous mass was seen above the left eye. The mass was not tender, inflamed, fluctuant or pulsatile.

Computed tomography (CT) scan showed a bony lesion along the superior orbital rim. On both CT and magnetic resonance (MR), there was a large, lobulated mass of mixed density within the left frontal sinus, measuring 2.6 x 4.5 cm. The mass had eroded the bone and extended intraorbitally and intracranially (Figs. 1, 2 and 3). A subcutaneous component was also seen but there were no other intracranial abnormalities (Figs. 2 and 3).

Based on the clinical and radiological findings, the most likely diagnosis was a frontal mucocele with secondary extension of the mucocele intracranially and intraorbitally. Differential diagnoses for the soft tissue mass included dermoid cysts, histiocytosis, fungal or tuberculous infection, or, less commonly, a neoplasm.

The diagnosis of a frontal mucocele was confirmed at surgery. Exenteration of the frontal sinus, decompression of the mucocele and endoscopic removal of the sinus mucosa and an osteoma obstructing the ostium was performed by a neurosurgeon and otolaryngologist. A left-sided frontal bone defect was seen corresponding to the region of the soft tissue swelling. Histopathology showed

¹ The Eye Institute
Tan Tock Seng Hospital, Singapore

² The Eye Institute
National University Hospital, Singapore

Address for Reprints: Dr Colin SH Tan, Department of Ophthalmology, Tan Tock Seng Hospital, 11 Jalan Tan Tock Seng, Singapore 308433.
Email: colintan_eye@yahoo.com.sg



Fig. 1. Coronal computed tomography shows extension of the frontal sinus mass both inferiorly into the orbit as well as superolaterally, eroding both tables of the frontal bone.

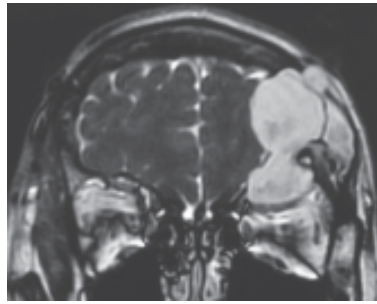


Fig. 2. Coronal magnetic resonance imaging shows dumbbell-shaped mucocele extending into the orbit as well as intracranially, compressing left frontal lobe, and extending through the frontal bone into the subcutaneous tissue.

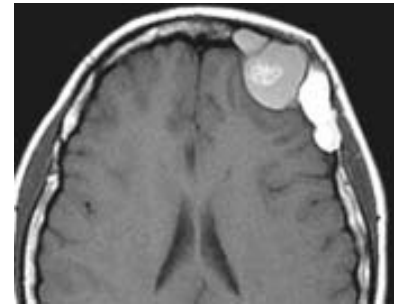


Fig. 3. Axial magnetic resonance imaging demonstrating invasion intracranially as well as through the frontal bone into the subcutaneous tissue.

a fibrous connective tissue cyst wall, partially lined by stratified squamous epithelium, with patchy chronic inflammation. These findings were consistent with the diagnosis of a mucocele.

When reviewed 6 months later, the patient was asymptomatic, vision and pupillary reflexes were normal and all ocular symptoms and signs had resolved. A repeat CT scan showed no recurrence of the mucocele.

Discussion

Frontal mucoceles are the most common (65%) among the paranasal sinus mucoceles. Although benign, the continuous or intermittent obstruction of the sinus ostium causes dilatation of the sinus cavity secondary to accumulation of mucoid material. Eventually, mucoceles may erode through bone and extend intracranially.¹⁻⁴ Mucoceles arising from the frontal sinus present with a variety of clinical signs such as decreased visual acuity, visual field abnormalities, proptosis, ptosis, periorbital swelling, displacement of the globe, restricted ocular movements and choroidal folds.^{5,6} Since a mucocele expands in the direction of least resistance, frontal mucoceles tend to erode the thin bone of the superior orbital wall, thus extending into the orbit and displacing the globe inferiorly.⁴ This, together with its effect on ocular motility, can result in diplopia.⁴ The patient's visual acuity is usually not affected unless there is compression of the optic nerve by the mass effect of the mucocele. However, mucoceles may cause choroidal folds which result in some disturbance of vision,⁶ which was noticed by our patient.

CT is the preferred mode of imaging for paranasal sinus pathology⁷ although MRI is useful in complicated cases with intracranial extension or infection. The diagnosis and

management of giant frontal mucoceles requires multidisciplinary cooperation.⁴

In an earlier report, a subcutaneous mass was the sole presenting complaint of a frontal mucocele with intracranial extension.¹ To the best of our knowledge, this is only the second patient presenting with such symptoms.

Conclusion

This case demonstrates that a subcutaneous soft-tissue mass may be the presenting sign of a frontal mucocele. Sinus pathology is a common source of orbital disease and it is important to consider these as differential diagnoses during the clinical workup of a patient with orbital disease presenting primarily with proptosis and ocular symptoms. A careful examination of the surrounding skin may suggest the diagnosis of sinus-related disease even before more extensive investigations are performed.

REFERENCES

1. Akiyama M, Inamoto N, Hashigucci K. Frontal mucocele presenting as a subcutaneous tumour on the forehead. *Dermatology* 1999;199:263-4.
2. Kawaguchi S, Sakaki T, Okuno S, Ida Y, Nishi N. Giant frontal mucocele extending into the anterior cranial fossa. *J Clin Neurosci* 2002;9:86-9.
3. Voegels RL, Balbani AP, Santos Junior RC, Butugan O. Frontoethmoidal mucocele with intracranial extension: a case report. *Ear Nose Throat J* 1998;77:117-20.
4. Tasman W, Jaeger EA. *Duane's Clinical Ophthalmology*. Vol 2. New York: JB Lippincott Co, 1994:3-7.
5. Hayasaka S, Shibasaki H, Sekimoto M, Setogawa T, Wakutani T. Ophthalmic complications in patients with paranasal sinus mucopyoceles. *Ophthalmologica* 1991;203:57-63.
6. Leventer DB, Linberg JV, Ellis B. Frontoethmoidal mucoceles causing bilateral chorioretinal folds. *Arch Ophthalmol* 2001;119:922-3.
7. Rao VM, Sharma D, Madan A. Imaging of frontal sinus disease: concepts, interpretation, and technology. *Otolaryngol Clin North Am* 2001;34:23-39.