Reminder of important clinical lesson

Frontal sinus mucocoeles presenting in the upper eyelid: an easily missed diagnosis

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Summary

Frontal sinus mucocoeles are epithelium-lined mucus-containing sacs that are capable of bony expansion causing a spectrum of ophthalmological symptoms. If left untreated, they can erode the thin sinus wall causing life-threatening complications such as meningitis. We would like to alert the clinicians to this diagnosis that can be easily misdiagnosed. The first patient appeared to have an allergic blepharo-conjunctivitis that was not responding to topical and systemic medications. The second patient presented with recurrent preseptal cellulitis unresponsive to oral antibiotics. CT imaging of both patients revealed frontal sinus mucocoeles. Both patients recovered well with sinus surgery. Management of these patients needed a close liaison with our ENT and radiology colleagues to warrant a good outcome.

BACKGROUND

We describe two patients presenting with swelling of the upper eyelid as a result of frontal sinus mucocoeles. The diagnosis may be missed initially and therefore we would like to highlight the features that should particularly alert the clinicians to this potentially sight-threatening, and even life-threatening, diagnosis.

CASE PRESENTATION

Case 1

A 64-year-old man presented with a 2-week history of epiphora and itchiness of the right eye. He was given Chloramphenicol eye drops by the chemist after which he complained of swelling of the right upper eyelid. He presented to the eye casualty because of worsening symptoms. He was generally fit and well except for treatment of hypertension. An ocular examination revealed an aided visual acuity of 6/9 in the right eye and 6/6 in the left eye. There was evidence of right upper eyelid oedema with no obvious mass lesion (recorded). The rest of the ocular examination was normal. He was diagnosed as having allergic conjunctivitis and given oral Chlorphenamine tablets 4 mg three times daily and Fluorometholone eye drops twice daily. As his symptoms did not improve even after 1 week, he returned to the eye casualty. He also noted that his vision had gradually deteriorated since the initial presentation. On examination, he had a corrected visual acuity of 6/24 in the right eye and 6/6 in the left eye. He was afebrile, had full colour vision with no relative afferent pupillary defect, no proptosis and had full extra-ocular movements. An examination of the anterior segment revealed a white eye, clear cornea, quiet anterior chamber and normal intraocular pressure. An examination of the fundus revealed a normal optic nerve head and macula with no choroidal folds. The only significant finding was a swelling of the right upper eyelid that was erythematous,

fluctuant and mildly tender, measuring 2.0×3.5 cm (figure 1). A differential diagnosis of skin abscess or frontal mucocoele was made and an urgent CT scan was requested which was done the same day.

Case 2

A 62-year-old woman presented with a 3-month history of intermittent swelling of the left upper eyelid. She was known to have systemic lupus erythematosus and had hypertension on treatment. She had no known allergies or any previous ophthalmic problems. On presentation, her corrected visual acuity was 6/9 in the right eye and 6/12 in the left eye. She was afebrile, had full extra-ocular movements, no relative afferent pupil defect, no proptosis and full colour vision. She had a mildly injected eye with a clear cornea, quiet anterior chamber and normal

Figure 1 Patient 1 presenting with swelling of the right upper eyelid.

Figure 2 A CT scan showing a defect in the superior orbital margin medially (10 mm) with connection between the frontal sinus and the orbit. A lesion measuring 17 mm lying in the eyelid, which enhances around the edge but not in the centre, suggests it could be a frontal sinus mucocele.

intraocular pressure. An examination of the fundus was unremarkable. A left upper eyelid mass measuring 3.0 × 2.0 cm was noted, which was erythematous, firm, well circumscribed, tender and minimally mobile. The patient was diagnosed to have preseptal cellulitis probably due to an infected sebaceous cyst. She was given oral Metronidazole 400 mg twice daily and Flucloxacillin 500 mg four times daily and reviewed 2 days later. When reviewed, the swelling was found to persist and it was still quite firm, well circumscribed and tender. A provisional diagnosis of mucocele was made and the patient was referred for an urgent CT scan. When reviewed with the results of the scan, it was also noted clinically that the posterior limit of the lesion was not palpable superiorly.

INVESTIGATIONS

Case 1

CT scans of orbits and sinuses were requested. The scans showed a defect in the superior orbital margin medially measuring 10 mm connecting the frontal sinus and the orbit. There was also a lesion measuring 17 mm in the eyelid, which enhanced around the edge but not centrally, suggesting a frontal sinus mucocele (figure 2). Also, the right frontal, ethmoidal and maxillary sinuses were filled with material of soft-tissue density.

Case 2

CT scans of orbits and sinuses were requested. A complete opacification of the left frontal sinus with fairly extensive bony defect anteriorly and inferiorly was noted (figure 3). This was associated with soft-tissue swelling of the left forehead, extending to the left orbit superiorly. These findings suggested a frontal sinus empyema with expansion. But the absence of other sinus disease raised the suspicion of a neoplastic lesion.

DIFFERENTIAL DIAGNOSIS

Differential diagnoses, besides frontal sinus mucocèles, in these cases (with the aid of the radiological evidence) can be made.

Case 1

Allergic conjunctivitis or preseptal cellulitis or skin abscess.

Case 2

Preseptal cellulitis secondary to infected sebaceous cyst or carcinoma of the sinuses.

TREATMENT

Case 1

An ENT assessment was requested. The patient then underwent an urgent endoscopic sinus surgery.

Figure 3 A CT scan showing complete opacification of the left frontal sinus with fairly extensive bony defect anteriorly and inferiorly associated with soft-tissue swelling of the forehead and superior orbit.

Intraoperatively, an osteoma was found occluding the frontal nasal duct that was cleared to access the frontal and ethmoidal sinuses. The histological specimens were confirmed to be inflammatory polyps with an osteoma.

Case 2

Following an ENT assessment, an urgent external drainage of the sinus was performed owing to the extensive nature of the changes in the CT scan. Histology results revealed an inflammatory lesion only with no evidence of malignancy.

OUTCOME AND FOLLOW-UP

Case 1

One month after the procedure, this patient's symptoms had resolved. Visual acuity improved to 6/6 in both eyes, suggesting the previous drop in visual acuity of the right eye was probably due to the ptosis or astigmatic effect from his swollen upper eyelid.

Case 2

One month after the procedure, symptoms had resolved and the patient was referred to a tertiary centre for consideration for frontal sinus obliteration to prevent recurrence of the condition (figure 4).

DISCUSSION

Frontal sinus mucocoeles are epithelium-lined mucus-containing sacs that completely fill a paranasal sinus and are capable of bony expansion causing a spectrum of ophthalmological symptoms. Mucocoeles are reported to be caused by inflammation, allergy, trauma, previous surgery, anatomical abnormality, osteoma, ossifying fibroma and fibrous dysplasia.¹ Most mucocoeles are benign lesions and are found in adults between 20 and 60 years of age with no sex predilection.² However, when these mucocoeles are left untreated, they can erode the thin sinus wall causing life-threatening complications such as meningitis, meningoencephalitis, pneumocephalus, brain abscess, seizures, cerebrospinal fluid fistula and brainstem stroke.^{3–5} In a retrospective study by Sadiq *et al*⁶ on 45 patients with mucocoeles, the

frontal sinuses were found to be the origin in 70%. The majority of these presented with peri-orbital swelling associated with pain. Other clinical features included diplopia, proptosis, hypoglobus, decreased colour vision, epiphora, facial swelling and nasal polyps.⁶

In both our cases, swelling of the upper eyelid was the main presenting feature. As they did not appear to have other clinical features (mentioned above) suggestive of a sinus mucocoele, this condition could have been easily misdiagnosed and treated inappropriately. However, the red flags that should be pointed out in our cases were the deteriorating vision, unresponsiveness to treatment and a palpable well-circumscribed mass. Failure to make the diagnosis in these patients could have had very serious consequences.

CT is more useful than MRI in delineating the extent of the mucocoele and its relations to other surrounding structures. CT demonstrates an airless, mucoid density-filled, expansile, non-enhancing sinus mass with gradual thinning and erosion of the bony margins. It also shows the extent of bony erosion better than MRI. MRI is better at differentiating mucocoeles from malignancy. Mucocoeles show thin peripheral linear enhancement with central low-signal intensity on T1-weighted images and malignant lesions demonstrate diffuse enhancement.

Treatment of mucocoeles involves surgical drainage and either marsupialisation or obliteration of the sinuses to prevent recurrences. This can be achieved by different surgical approaches. Endoscopic sinus surgery remains the current choice of treatment but the presence of risk factors (eg, trauma or previous surgery) or unfavourable surgical access to the frontal sinus outflow tract may influence the surgeon to select an open approach over an endoscopic approach.⁷ The external approach was preferred in our second patient, probably because of the suspicion of malignancy and quite extensive disease of the sinuses.

Learning points

- ▶ As illustrated in our cases, mucocoeles can be an orbital disease that can be easily overlooked.
- ▶ Careful consideration of it as a differential can prevent severe complications.
- ▶ A thorough history and orbital examination should never be replaced by radiological investigation.
- ▶ A prompt diagnosis and close liaison with radiology and ENT colleagues will achieve a good outcome.

Competing interests None.

Patient consent Obtained.

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Figure 4 Patient 2 following external drainage sinus surgery with full resolution of the swelling of the eyelid.

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