CASE REPORT

Frontal sinus mucocoele: a rare cause of ptosis

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SUMMARY

A 73-year-old man, with no medical history of note, presented with a 4-week history of an isolated left-sided ptosis and associated periorbital and retro-orbital discomfort. His pupils were spared, his eye movements were not restricted and he was not proptosed. A prompt CT orbits and head scan revealed a large left frontal sinus mucocoele that had eroded into the left orbit. The patient had successful endoscopic sinus surgery under the ear, nose and throat team and 1 month later was seen in ophthalmology clinic. His ptosis and discomfort had fully resolved and he had no neurological sequelae from the surgery.

BACKGROUND

Unilateral eyelid ptosis is drooping of the upper eyelid secondary to levator palpebrae superioris weakness. It is a common presentation in eye clinics and is usually involutional and not sinister in nature.

However, an associated headache should ring alarm bells. The patient is deemed to have a 'painful third nerve palsy' until proven otherwise. If no ocular cause is found, an urgent CT of the head is arranged to rule out potentially very serious causes of this presentation, for example, a sub-arachnoid haemorrhage.

We present the case of a patient presenting with a painful left lid ptosis. Surprisingly, a prompt CT scan revealed a left frontal sinus mucocoele eroding into the left orbit. The very rare cause of this very common sign is not usually on most clinician's list of differential diagnoses.

CASE PRESENTATION

A 73-year-old man attended A&E department on his general practitioner's recommendation. After an initial assessment he was referred to the hospital's out-of-hours ophthalmology service.

He described a 4-week history of a gradual onset left ptosis, which had worsened considerably over the preceding 48 h (figure 1). It was now associated with a heavy sensation, and mild pain around and behind his left eye, but he did not describe a significant headache.

He had no diplopia, no limb weakness, no altered sensation and no speech disturbance. He had no ocular pain and did not describe any redness or discharge. He had no history of trauma.

He had an ophthalmic history of a right retinal tear for which he had received laser surgery 8 years previously. He had no medical history of note including diabetes and hypertension and did not take any regular medication. In addition, he had no history of trauma or previous sinus surgery. His

mother had glaucoma but he had no other relevant family history.

On examination, he had visual acuity of 6/18 in the right eye and 6/9 in the left. He had a partial left-sided ptosis with a margin reflex distance of 1 mm on the left and 3 mm on the right. His levator function was 13 mm on the left and 16 on the right. Assessment of his optic nerve function was intact: his pupils were equal and reactive in ambient and dark light, he had no relative afferent pupillary defect, his colour vision using Ishihara charts was 15/17 bilaterally, his visual fields on confrontation were full and his optic discs were healthy. He had full extra-ocular eye movements which did not provoke diplopia and he did not have proptosis. His intraocular pressures were 10 in both eyes. The rest of the ocular examination was also unremarkable. Examination of his cranial nerves and peripheral nervous system were also unremarkable.

INVESTIGATIONS

At this stage, prior to further investigation, there are countless differential diagnoses for painful third nerve palsy. However, every clinician should be wary of the potentially more harmful causes.

In the context of a severe headache, a subarachnoid headache should first be ruled out. Pain can also be associated with tumours and other compressive lesions such as aneurysms, usually of the posterior communicating artery. Pain due to ischaemia is another important cause and a full vascular work-up looking for signs of hypertension, diabetes and hyperlipidaemia should be performed. A history of trauma should be explored, and demyelination and vasculitis should also be considered. It is also essential to emphasise the importance of pupillary examination, as mydriasis with no light or near response is strongly suggestive of a compressive lesion. This would be called a pupil involving third nerve palsy. However, if presented with a painful pupil-sparing palsy, one should not feel entirely reassured, as this could simply be the early stages of an evolving and serious underlying diagnosis.

As this was possibly an evolving painful third nerve palsy, a CT of the patient's head and orbits with contrast was performed immediately.

This revealed complete opacification of the frontal sinuses bilaterally. On the left side, there was an expansion of the sinus by isodense soft tissue, which had eroded and thinned the floor of the left frontal sinus such that it was bulging inferiorly into the roof of the left orbital fossa, displacing the left eye inferiorly. The roof of the left frontal sinus was also thinned and eroded but there

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Figure 1 The top image demonstrating left partial ptosis without pupillary or extra-ocular muscle involvement. The bottom image demonstrating the complete resolution of the ptosis during the postoperative period.

was no intracerebral abnormality. The maxillary sinuses were also completely opacified as were the anterior ethmoid air cells.

The report concluded that the patient had a left frontal sinus mucocoele, on a background of chronic sinusitis, causing a mechanical ptosis of the left eye (figures 2–4).

The patient was therefore referred to ear, nose and throat (ENT) department.

OUTCOME AND FOLLOW-UP

The patient was seen by the ENT team the following week in clinic, and a few weeks later had functional endoscopic sinus

Figure 2 Axial CT section demonstrating the eroded roof of the left frontal sinus.

Figure 3 Axial CT slice demonstrating the invasion of the left frontal sinus mucocoele into the left orbit.

surgery and left frontal sinus drainage. The surgery was successful.

One month later, the patient attended ophthalmic clinic and his ptosis had fully resolved (figure 1). Lid measurements were equal bilaterally as was levator function. He also no longer had any discomfort around and behind his left eye.

DISCUSSION

A sinus mucocoele is an epithelium-lined sac within a sinus. These form secondary to sinus obstruction by, for example, polyps, tumours or chronic sinusitis. Previous trauma or surgery can also predispose patients to them. They can expand and ultimately cause destruction to their containing walls. Such erosion can have consequences on adjacent structures such as the orbit.

Frontal sinus mucocoeles causing ptosis having eroded through the orbital roof is a very rare occurrence. Two other

Figure 4 Coronal CT scan slice demonstrating the invasion of the left frontal sinus mucocoele through the eroded floor of the sinus and into the left orbit. It also demonstrates the eroded roof of the sinus.

such cases have been reported in New York in 1994 and Taiwan in 2002.^{1 2} However, these patients also had severely restricted upgaze suggesting far greater compression of the third nerve than in our case.

Notably, sinus mucocoeles are also capable of causing other ophthalmic signs. Capra *et al*³ reported a mucocoele causing chemosis and ptosis without ptosis or restricted extraocular movements. This mucocoele had arisen from the ethmoidal sinus. Peral Cagigal *et al*⁴ described a frontal sinus mucocoele causing ptosis, diplopia and headache.

Importantly, in the above cases, orbital and brain imaging, be it MRI or CT, would have been urgently indicated due to the

potentially fatal list of differential diagnoses. A CT scan would be most useful for bone analysis while MRI would be best used for assessment of the extra ocular muscles, major arteries and cranial nerves.

The definitive treatment for frontal sinus mucocoeles is surgical. Aggarwal *et al*⁵ confirmed that endoscopic sinus surgery is the 'treatment of choice' for such cases. However, for larger or more complex cases, a more radical or open approach may have to be adopted.

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Learning points

- ▶ Patients presenting with a painful third nerve palsy, whether pupil involving or sparing, warrant an urgent orbital and head scan.
- ▶ Sinus mucocoeles should be included in clinician's list of differential diagnoses for patients presenting with ptosis.
- ▶ It is essential to ask patients with this diagnosis about previous sinus surgery or trauma during history taking.
- ▶ Surgery is the definitive treatment for frontal sinus mucocoeles under the care of ear, nose and throat department.

REFERENCES

- 1 Ehrenpreis S, Biedlingmaier J. Isolated third-nerve palsy associated with frontal sinus mucocoele. *J Neuroophthalmol* 1995;15:105–10.
- 2 Lin CJ, Kao CH, Kang BH *et al*. Frontal sinus mucocoele presenting as oculomotor nerve palsy. *Otolaryngol Head Neck Surg* 2002;126:588–90.
- 3 Capra GG, Carbone PN, Mullin DP. Paranasal sinus mucocoele. *Head Neck Pathol* 2002;6:369–72.
- 4 Peral Cagigal B, Barrientos Lezcano J, Florian Blanco R, *et al*. Frontal sinus mucocoele with intracranial and intraorbital extension. *Med Oral Patol Oral Cir Bucal* 2006;11:E527–30.
- 5 Aggarwal SK, Bhavana K, Keshri A *et al*. Frontal sinus mucocoele with orbital complications: management by varied surgical approaches. *Asian J Neurosurg* 2012;7:135–40.

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