A frontal swelling with a cautionary tale

Précis
A frontal swelling with a cautionary tale – a case report highlighting the importance of a careful working diagnosis and management of patients presenting with neurological symptoms with an associated frontal swelling.

Abstract
Frontal sinus mucoceles are the most common paranasal mucoceles. They consist of sterile mucus and shed cells and form due to inflammatory changes or chronic nasofrontal duct obstruction. Coincident infection and expansile growth can lead to specific clinical features dependent upon the location of the lesion and the degree of spread. We present a case of a 56-year-old lady with a radiological diagnosis of a frontal sinus mucocele causing anterior dehiscence of her frontal cortex. She underwent incision and drainage of a frontal swelling misdiagnosed as an infected sebaceous cyst. The case emphasises the importance of correlating features in the patient history and previous investigations with presenting findings.
computed tomography (CT) scan was requested due to persistence of her symptoms. This demonstrated expansion of the right frontal sinus and bony erosion of the anterior and posterior cortices. A right frontal mucocele was evident expanding inferiorly into the orbit, posteriorly into the anterior cranial fossa and anteriorly into the soft tissues of the forehead (Figure 2). However, before she attended her planned ENT outpatient review appointment with the results of her CT scan, she presented to an emergency department at another hospital complaining of a constant throbbing frontal headache and an associated tender swelling on her forehead (Figure 3). The swelling was clinically diagnosed as an infected sebaceous cyst and immediately incised and drained under local anaesthetic. Pus discharge was noted with no subsequent microbiological growth. On her subsequent scheduled ENT clinic review, the frontal cortex dehiscence caused by the frontal sinus mucocele was noted on her CT scan. The incision and drainage previously carried out effectively converted the condition from a mucocele to a fistula. An endoscopic procedure was planned to establish drainage of the frontal sinus.

Surgical intervention was offered to the patient; however, she declined surgery and is therefore under regular clinical review.

Discussion

The frontal sinus is funnel shaped with a central septum. Its floor slopes inferiorly to the midline where the ostium is located. An hourglass shaped narrowing called the frontal recess is located between the frontal sinus and anterior middle meatus. Obstruction at this narrowing results in loss of ventilation and mucus drainage from the frontal sinus. Obstruction can be caused by congenital abnormalities, allergy, infections, trauma, previous surgery and neoplasms.

Frontal sinus mucoceles are the most common paranasal mucoceles. Expansion of the frontal mucocele can be inferior (into the paranasal sinuses, nose and orbits), posterior (into the anterior cranial fossa) or anterior (into the forehead skin). Therefore, in some instances, an infected frontal mucocele may present as a localised tender forehead swelling masquerading as an infected sebaceous cyst.
In this case, a 56-year-old lady with radiological evidence of a frontal sinus mucocele involving both the inner and outer tables of the frontal cortex presented to another hospital where clinicians were unfamiliar with her primary diagnosis. A misdiagnosis of an infected sebaceous cyst was reached and a surgical intervention was carried out, which could have been potentially harmful to the patient. In this case, however, the intervention was therapeutic to the patient and she was relieved of her constant throbbing headache with no untoward neurological sequelae.

It is important to be cautious when presented with swellings involving the midline of the forehead, lateral canthus or over the cranium near the suture lines. These may represent swellings with intracranial extension, or dehiscence of the brain or its surrounding structures. Clinicians need to be aware of this and need to investigate this further, either with an MRI or a CT scan before a biopsy.

Clinical features of frontal sinus mucoceles depend upon the specific location and growth behaviour. Visual disturbances represent the most common complaint. Pain is suggestive of an infection (mucopyocele). Inferior extension into the orbits can lead to ocular disturbances including diplopia, proptosis and ophthalmoplegia. Posterior extension into the anterior cranial fossa can lead to neurological complications, including a cerebrospinal leak, meningoencephalitis and pneumocephalus.

The diagnosis of mucoceles is aided with CT scanning combined with MRI. CT scanning is utilised to define the regional anatomy and presence of bony erosion. This allows accurate lesion localisation and degree of extension to be determined. Bone erosion can be detected and the surgeon gains invaluable insight on frontal sinus anatomy required for surgical planning. MRI scanning is useful for differentiating mucoceles from tumours. It also aids in demarcating mucoceles from other soft tissue structures in cases with intracranial or intraorbital spread.

The primary management of mucoceles is surgery, which ranges from functional endoscopic sinus surgery to open procedures. As surgical instrumentation has developed, the surgical treatment of mucoceles has developed into less invasive procedures with emphasis on drainage over ablation. This is less invasive, preserves sinus architecture and leaves no facial scarring. Complex cases with intracranial or orbital extension require an open procedure involving a craniotomy in order to remove the entire cyst lining and establish a drainage pathway to prevent recurrence. Recurrence rates have been variably reported as between 0.9 and 23%.

We highlight the importance of evaluating patient symptoms with the clinical presentation, and the need to review previous related investigations to be aware of potential pitfalls in the differential diagnosis. This allows the condition to be treated in the most appropriate manner, and encourages safer and more effective practice.

References