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Radiology in Focus

Occult sphenoid sinusitis presenting clinically as parotid swelling: A case report

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Abstract
A case of occult sphenoid sinusitis was diagnosed by an MRI scan in a patient who presented clinically with meningism and unilateral parotid swelling. Although the patient improved with a prolonged course of antibiotics complete resolution occurred only after surgical drainage of the affected sinus.

Key words: Sphenoid sinusitis; Meningitis

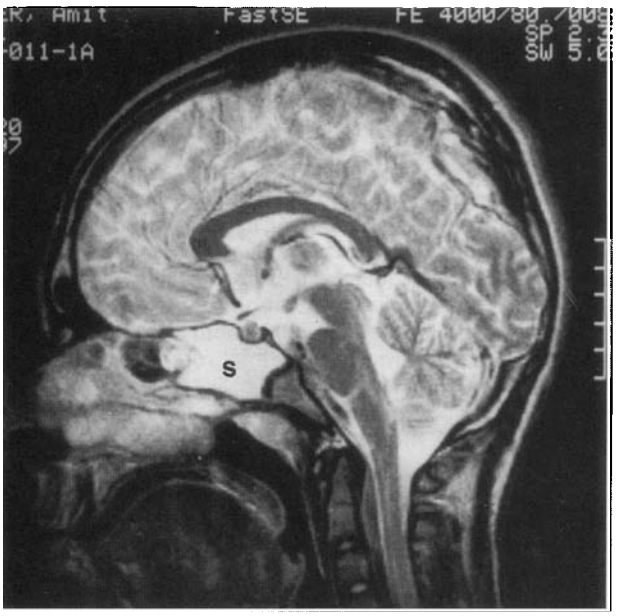
Introduction

Isolated sphenoid sinusitis is an uncommon condition (Wyllie *et al.*, 1973; Holt *et al.*, 1984). It usually presents with retro-orbital headache and the diagnosis is made only when intracranial complications have occurred. This case report is of occult sphenoid sinusitis in an otherwise healthy teenager, presented with meningism and apparent swelling in the parotid region.

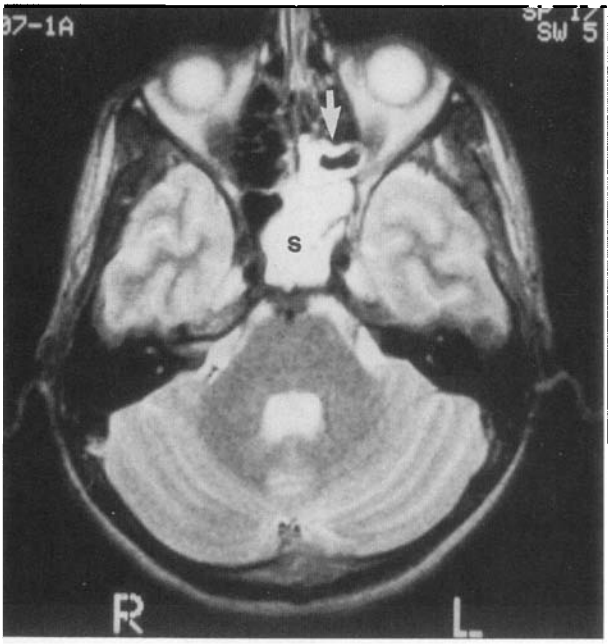
Case report

A 14-year-old boy was admitted to the paediatric unit with a complaint of severe frontal headache and fever for two days. He had no history of an upper respiratory tract infection.

On clinical examination he was febrile (39.5°C) with marked photophobia and signs of meningial irritation (neck rigidity and Kernig's sign).



(a)



(b)

FIG. 1

(a) T2 weighted (fast spin echo) midline sagital scan of head and neck. (b) T2 weighted (fast spin echo) axial scan through the sphenoid sinus.
These representative scans demonstrate high signal material in the sphenoid(s) and posterior ethmoid sinus (white arrow) only. The maxillary frontal and ethmoidal cells were clear.

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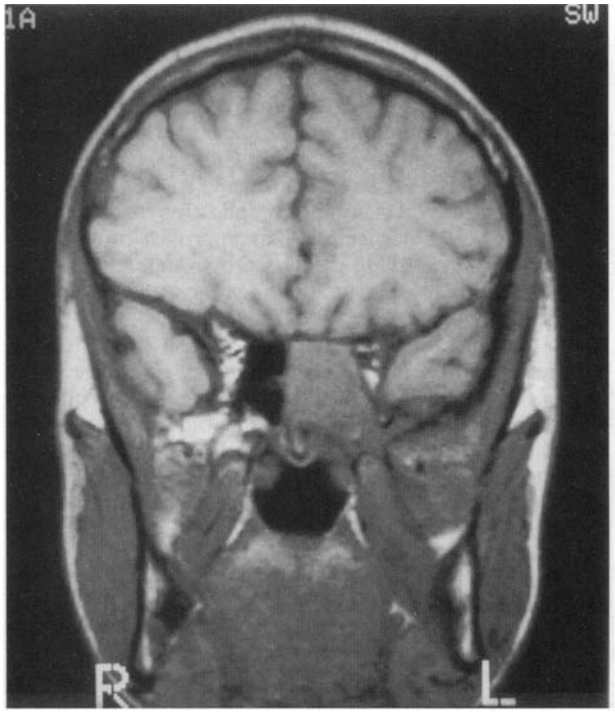

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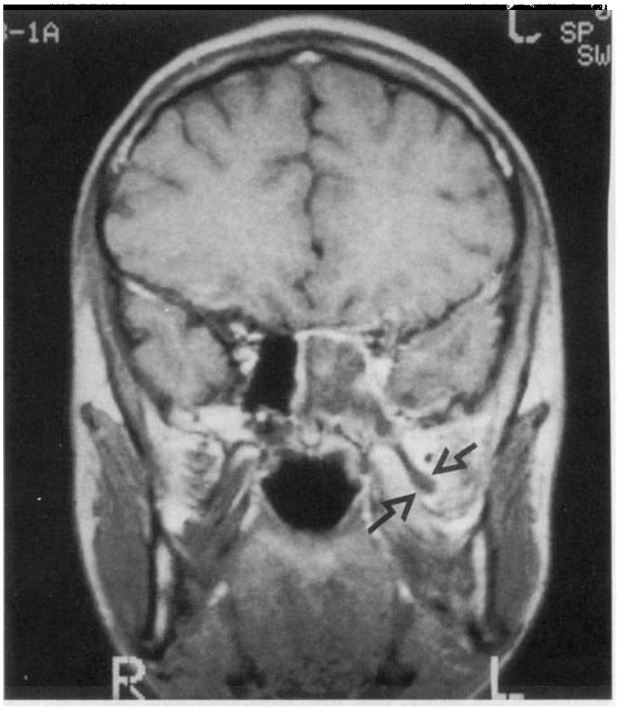

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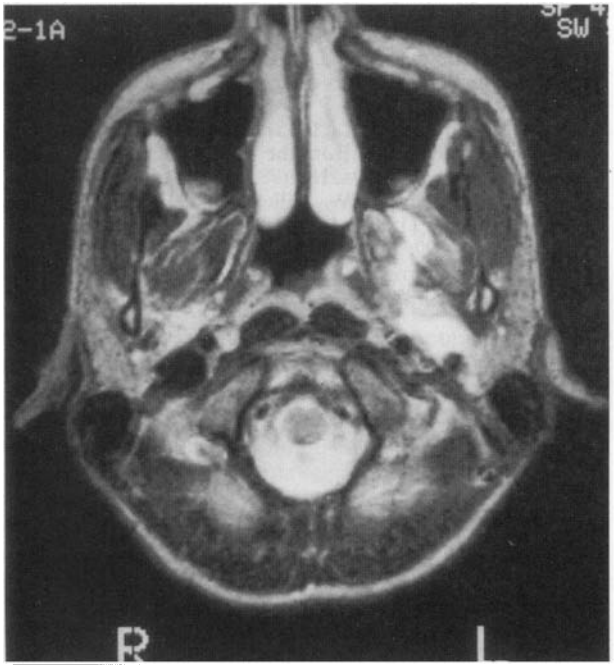

(c)

FIG. 2

T1 weighted coronal image without (a) and with (b) intra-venous gadolinium contrast at the same level. (c) T2 weighted axial scan.

In 2(a) intermediate signal material is seen in the sphenoid sinus on the left and extending medial to the pterygoid muscle. After enhancement the mucosa and adjacent soft tissues enhance clearly revealing a tract of non-enhancing pus (two black arrows).

Full blood count at admission had shown leucocytosis with neutrophilia. C-reactive protein was markedly elevated (>85). Blood culture grew *Staphylococcus aureus* but no organisms were found on cerebro-spinal fluid (CSF) smear or culture; the CSF showed normal protein, glucose and cell count.

The patient was started on intra-venous (IV) cefotaxime on the day of admission and i.v. flucloxacillin was added after blood culture results were available. The fever settled down on day five after admission but the patient developed a swelling in the left parotid region. An ultra-sound did not show any abnormality.

Following a maxillo-facial consultation, a bone scan was requested to rule out osteomyelitis (because of the staphylococcus isolated earlier) Technetium methylene diphosphonate scan showed an increased uptake in the left sphenoid sinus region. A magnetic resonance imaging scan (MRI) showed abnormal tissue in the left sphenoid sinus extending into the greater wing of sphenoid with rim enhancement, suggesting that the sphenoid sinus and adjacent sphenoid bone were filled with pus which was tracking into the pterygoid region, deep to the left parotid, displacing the parotid laterally (Figures 1a, b and 2a, b, c).

The patient was discharged two weeks after admission on oral antibiotics for four weeks and when reviewed after two weeks was found to be clinically stable but a repeat MRI scan showed persistent sphenoid disease.

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After two more weeks his nose and sinuses were examined under general anaesthesia and an endoscopic clearance of sphenoid sinus was performed. At surgery, the sphenoid sinus was filled with congested polypoid tissue, later reported as chronic inflammatory tissue. The last follow-up two weeks after surgery did not show any sign of infection on endoscopic examination.

Discussion

Characteristic symptoms of sphenoiditis are severe retro-orbital pain and occipital or bi-temporal headache (Abramovich and Smelt, 1982). A correct diagnosis is made early if it is accompanied by other symptoms of sinusitis such as rhinorrhoea and nasal obstruction and when it occurs in conjunction with infection of other paranasal sinuses. Predisposing factors if present may also point to the correct diagnosis; these are upper respiratory infections, swimming and diving (which forces water intranasally), maxillofacial trauma, diabetes and immunodeficiency states (Holt *et al.*, 1984). Isolated sphenoid sinusitis is usually misdiagnosed since the initial presentation may be neurological. In a 12-year series from Mount Sinai Medical Center, among 29 patients with isolated sphenoid sinusitis, 24 presented with headache alone, one with diplopia alone, one with headache and diplopia, one with headache and meningitis, one with scotoma and one with facial pain (Pearlman *et al.*, 1989).

Holt *et al.* (1984) have pointed out isolated sphenoiditis can masquerade as many other clinical conditions unrelated to ENT symptoms. This can be explained by the close anatomical relationship of the sinus to the duramater, pituitary gland, cavernous sinus, carotid artery, cranial nerves II to VI, sphenopalatine canal, artery, nerve and ganglion. Further caudally and laterally the sinus is related to the pterygoid region which is related to the parotid gland medially.

Complications of isolated sphenoiditis quoted in literature (Holt, 1984; Brockbank and Brookes, 1991) include, decreased visual acuity/blindness (IInd nerve), photophobia and diplopia (III, IV, VII nerves), facial paraesthesia/numbness, papilloedema, cavernous sinus thrombosis, abscess (cerebral, subdural, extradural), orbital cellulitis/abscess, orbital apex syndrome, hypopituitarism and aseptic meningitis. These complications may set in earlier in the course of a sinusitis if there is already a preformed pathway in the bone by way of congenital deficiencies (Mills and Kartush, 1985).

The first presentation may be as a complication with high mortality and morbidity. Although rare, isolated sphenoid sinusitis should be considered as a differential diagnosis in cases with severe headache and other neurological presentation.

The radiological investigation of choice for paranasal sinus infection is a CT scan. However MRI scan images are useful when an intracranial complication or other soft tissue lesions are suspected. This approach proved very useful in this case where pus was shown to track from the left sphenoid region to the deep pterygoid region, displacing the left parotid gland laterally.

The patient became afebrile after a week of i.v. antibiotics and CRP was less than five at discharge at the end of two weeks. The disease however persisted prompting endoscopic drainage. As the sphenoid sinus drains by a small non-dependent ostium anteriorly into the sphenoethmoidal recess, complete resolution of inflammation may not occur with i.v. antibiotics alone and these cases will need surgical intervention. This report adds another mode of presentation which has not been reported earlier, namely an apparent parotid swelling caused by its displacement.

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