Bacterial meningitis resulting in visual impairment and panhypopituitarism

Introduction

A previously healthy man presented with headache, fever, neck stiffness and confusion. Computed tomography showed severe sinusitis and CSF examination was consistent with bacterial meningitis. He was sedated and ventilated in intensive care and when sedation was withdrawn he was blind as a result of bilateral optic atrophy. He went on to develop panhypopituitarism.

Discussion

This patient appears to have developed bacterial meningitis secondary to sinusitis. *Streptococcus pneumoniae* and *Haemophilus influenzae* are thought to be the major bacterial pathogens in adults with sinusitis (Piccirillo, 2006). A study of 87 cases of pneumococcal meningitis in adults by Kastenbauer and Pfister (2003) showed that 50% had underlying ear or sinus infection.

The patient had a typical presentation of meningitis with fever, neck stiffness, photophobia and altered mental state. While there was a cellular response in keeping with bacterial meningitis (CSF showing high neutrophils, high protein and low glucose), despite only receiving one dose of antibiotics before lumbar puncture, no organism was cultured.

Hearing loss is a well-recognized complication of bacterial meningitis, occurring in 14–20% of cases (Van de Beek et al, 2006). The development of optic atrophy is rare but has been described in children (Ellsworth et al, 1979). It may result from optic nerve damage by raised intracranial pressure, infarction, inflammation or as a direct result of infection. The prognosis is uncertain.

As far as the authors are aware, pituitary dysfunction has not previously been described as a consequence of bacterial meningitis. The mechanism of damage to the gland is not known. It may be that the chiasmal inflammation caused compression of the pituitary, or there may have been pituitary infiltration. It remains to be seen whether this damage is permanent.

Ellsworth J, Marks MI, Vose A (1979) Meningococcal meningitis in children. *Can Med Assoc J* **120**(2): 155–8

Kastenbauer S, Pfister HW (2003) Pneumococcal meningitis in adults. Spectrum of complications and prognostic factors in a series of 87 cases. *Brain* **126:** 1015–25

Piccirillo JF (2006) Acute bacterial sinusitis. *N Engl J Med* **351:** 902–10

Van de Beek D, de Gans J, Tunkerl AR, Wijdicks FM (2006) Community-acquired bacterial meningitis in adults. *N Engl J Med* **354:** 44–53

Case Report

A 30-year-old man presented to his local district general hospital with a week-long history of headache, cough and coryzal symptoms, followed by 24 hours of fever, neck stiffness, photophobia, confusion and agitation. He had no significant previous medical history. Examination revealed a Glasgow Coma Score of 11 (E4, M5, V2), stiff neck, tachypnoea and tachycardia. There were no localizing neurological signs. Mucus was crusted around the nose.

The patient was sedated and ventilated in intensive care and given intravenous benzylpenicillin and cefotaxime. He then underwent a computed tomography (CT) head scan, which suggested fluid in the paranasal sinuses and pus filling the maxillary antrum.

CSF was turbid, containing 16 000 white cells/mm^3 (97% polymorphs), protein 3.22 g/litre and glucose 0.1 mM although no organisms were seen on Gram stain. At this point the patient was transferred to a tertiary neurology centre, where a repeat CT after 3 days showed further fluid and oedema in the paranasal sinuses. Sinus washout was performed and nasal decongestants prescribed. Initial attempts at extubation led to repeated seizures. Blood tests performed included assessment of pituitary profile, which was unremarkable.

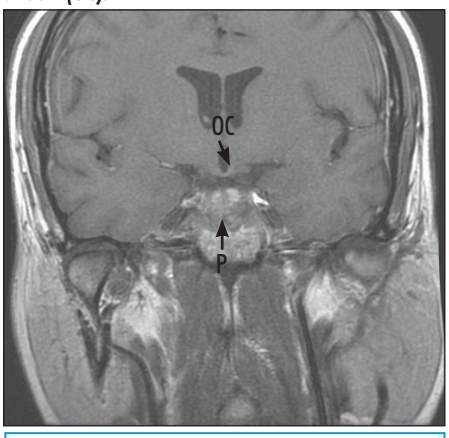
Sedation was withdrawn 10 days after admission and the patient extubated; once awake it became clear that he was blind. The patient was pyrexial (38°C), agitated and hallucinating. It was thought that he had Anton's syndrome (cortical blindness and poor awareness of blindness). He was transferred to a neurology ward and a low-dose antipsychotic was started. The patient became more alert and orientated, and able to cooperate with ophthalmological examination, which established healthy optic discs, no intraocular abnormality, no papilloedema and no afferent papillary defect, supporting the diagnosis of cortical blindness.

A repeat CT scan to investigate his continuing headache demonstrated loss of radiolucency of all the paranasal sinuses and the patient underwent functional endoscopic sinus surgery; this involved bilateral eithmoidectomy, sphenoidectomy and insertion of stents into both frontal sinuses. An audiogram demonstrated high frequency sensorineural deafness.

The patient's condition improved and his eyesight partly recovered (visual acuity 6/60 right eye and 6/24 left eye). Further ophthalmology examination revealed bilateral disc pallor and optic atrophy was diagnosed.

It was noticed that this patient's skin had become soft, pale and wrinkled and he was shaving less frequently than usual. On the basis of his skin appearance, a diagnosis of possible hypopituitarism was made, and pituitary hormone profile was assessed. This revealed panhypopituitarism and magnetic resonance imaging confirmed the presence of gross inflammation in the optic chiasm and around the pituitary, although the pituitary gland itself appeared intact (*Figure 1*). The patient was discharged home on pituitary replacement therapy with planned regular follow-up.

Figure 1. Magnetic resonance image showing inflammation around the pituitary (P) and optic chiasm (OC).



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