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## Lesson of the week

# Orbital trauma: do not blow your nose

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**Patients with proved or suspected orbital or sinus fractures should be told not to blow their nose and should be prescribed prophylactic antibiotics**

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Orbital infections may be divided into preseptal cellulitis, in which infection is located anterior to the orbital septum (a thin sheet of fibrous tissue arising from the tarsal plates), and orbital cellulitis, in which there is infection of orbital tissues posterior to the orbital septum. Preseptal cellulitis generally responds to oral antibiotics and rarely has important sequelae. However, orbital cellulitis is a serious infection which may be complicated by abscess formation (subperiosteal, orbital, or brain), meningitis, septicaemia, cavernous sinus thrombosis, and death. Although orbital cellulitis is related to ethmoid sinusitis in 70-80% of cases,<sup>1</sup> it may also develop after orbital or sinus trauma.<sup>2,3</sup> Prompt and appropriate management of patients with orbital cellulitis or at risk of developing this minimises the risk of complications.

## Case history

A 16 year old girl attended her local casualty department after sustaining a blow to the right side of her face. Facial radiography showed a minimally displaced fracture of her right zygoma. She was sent home and told to report three days later to the Bristol Eye Hospital. She was not given antibiotics or told not to blow her nose, nor was she warned about symptoms that would require prompt review.

When she was seen at the eye hospital, the girl was feverish and feeling unwell, and the right side of her face had become swollen, red, and tender (fig 1). She said that her facial swelling had increased suddenly on the previous day, after she had blown her nose. Ocular examination showed an immobile, proptotic eye with a

fixed dilated pupil. She had an afferent pupillary defect and her vision was limited to perception of light. The patient's fundus was pale (infarcted) and looked funnel-like. Urgent computed tomography showed gross proptosis with the globe compressed into a conical shape (fig 2); fractures of the lateral wall of the maxillary sinus, the orbital floor, and the zygomatic arch; and diastasis of the zygomaticofrontal suture. There was opacification of the ethmoid, frontal, and maxillary sinuses, and gas was noted in the periorbital tissues.

The patient was immediately started on intravenous cefuroxime and flucloxacillin, and intravenous metronidazole was added 12 hours later. Despite this treatment her condition deteriorated and a purulent discharge began draining from her palpebral aperture. She had emergency surgery and a large amount of pus and necrotic tissue was removed from the posterior orbit and the maxillary and ethmoid sinuses. Postoperative antibiotic treatment consisted of intravenous cefotaxime (2 g three times daily), flucloxacillin (1 g four times daily), and metronidazole (500 mg four times daily).

After surgery the girl spent 18 hours in intensive care. *Streptococcus milleri*, a common cause of deep seated abscesses and an occasional inhabitant of the upper respiratory tract, was cultured. Over the course of a week her facial swelling reduced and she was discharged home and given oral antibiotics. At discharge her facial swelling and proptosis had reduced appreciably, but her eye remained virtually immobile, her pupil was still fixed and dilated, and her vision was limited to perception of light. Four months later there was still little ocular movement or lid function and visual acuity was limited to hand movements.

## Comment

This case highlights the potentially serious nature of orbital infections. Several principles of management will minimise the risks to patients who have suffered orbital trauma and all those at risk of orbital infection.

Patients with suspected or proved orbital or sinus trauma should be seen by an appropriate specialist. If a delay in further assessment is expected and patients are allowed home, they must be told to return urgently to the hospital if they notice any deterioration in vision, diplopia (with the lid lifted), an increase in pain or swelling, or if they begin to feel unwell. In addition, patients should be prescribed prophylactic antibiotics to protect against the organisms that most often cause orbital cellulitis of sinus origin—*Staphylococcus aureus*, *Streptococcus pneumoniae*, *Streptococcus pyogenes*, anaerobic organisms,<sup>4</sup> and, in children under 5 years, *Haemophilus influenzae*.<sup>5</sup>

Patients must also be warned not to blow their nose—although they may wipe their nose should the need arise—and to avoid sneezing if possible. Precautions may need to be taken to avoid vomiting.<sup>6</sup> Surgical emphysema, although a useful radiological sign, should act as a warning that either potentially infectious material has been forced into the orbit from the sinuses or that infection with a gas forming organism, such as clostridia, bacteroides, anaerobic streptococci, *Escherichia coli*, proteus, or klebsiella, is already present.<sup>7-9</sup> Subsequent infection or an increase in intraorbital pressure may lead to severe damage to the eye.<sup>10</sup>

If orbital cellulitis is suspected:

- Admit the patient to hospital immediately
- Prescribe broad spectrum intravenous antibiotics (cefotaxime or high dose cefuroxime, and metronidazole<sup>11</sup>)
- Assess the bony orbit, orbital contents, and cranium with computed tomography<sup>3 10</sup>
- Take a blood sample for culture of organisms
- Monitor visual acuity, pupillary responses, or colour vision regularly.

Further management is guided by the patient's response to treatment and may include orbital exploration, drainage, and fracture repair.

In summary, the potentially serious nature of orbital cellulitis requires a clear set of management guidelines. Any patient who is at risk of orbital infection after proved or suspected trauma to the orbit or sinuses should be assessed urgently by an appropriate hospital specialist, instructed not to blow their nose, warned about the signs of infection, and given broad spectrum antibiotics.<sup>12</sup>

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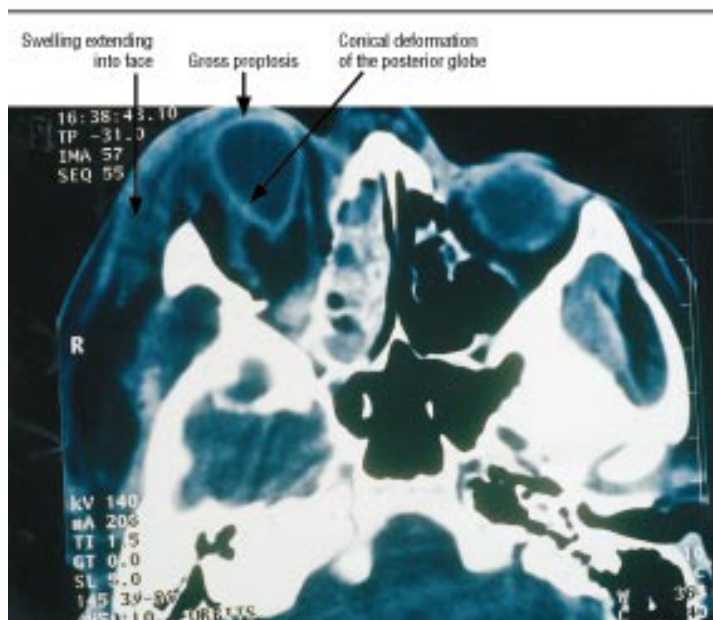


Fig 1 Facial and eyelid swelling in a patient with orbital cellulitis



Fig 2 Gross proptosis with conical deformation of the posterior segment of the globe and swelling extending into the tissues of the right side of the face

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