"The worst sinus headache of my life..."

Simon Field, MB, BCh, CCFP (EM); and Shannon Curtis, BSc

Guy's initial presentation

- Guy, 45, presents to the ED with complaints of a headache, a sore throat, dizziness, non-productive cough and blurred vision, which began two days prior.
- Examination further reveals a fever, with a temperature of 38.2 C and left sinus pain with retro-orbital radiation.
- A diagnosis of sinusitis is made and he is sent home with azithromycin, decongestants and analgesics.

Two days later...

- Guy returns with increasing pain, erythema of the left upper eyelid and a temperature of 39.9 C.
- A complete blood count reveals a 12.9 leukocyte count (87% neutrophils).
- An orbital CT scan (see page 4) revealed left orbital proptosis and extraconal soft tissue thickening, extending into the posterior aspect of left orbit. Also, apparent on the left side is frontal and ethmoid sinusitis and mucosal thickening within the anterior sphenoid and maxillary sinuses. There is an increase in soft tissue stranding in the left superior orbit and there is evidence of a small abscess in the posterior orbital roof. There is no intracranial pathology.
- Guy is immediately referred to ophthalmology, which admits him to the hospital for intravenous antibiotics.

Questions & Answers

1. What is the clinical presentation of orbital cellulitis?

Orbital cellulitis (OC) can present in patients of any age and sex. A history of chronic sinusitis, recent upper respiratory tract infection, thick mucous secretions, or dental disease is important in any patient with suspected OC. It is important to distinguish OC from periorbital cellulitis—in which there is no orbital involvement—not only because of the different treatment options, but also because OC is a potentially life-threatening disease. Both can cause induration, erythema and tenderness of the periorbital tissues. However, OC can further result in proptosis, pain upon eye movement, ophthalmoplegia, edema of the conjunctiva, decreased visual acuity, fever and malaise. The cardinal signs of OC are ophthalmoplegia and proptosis.

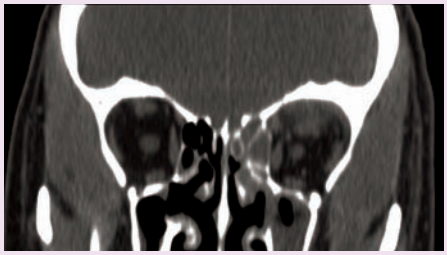
2. Causes of OC:

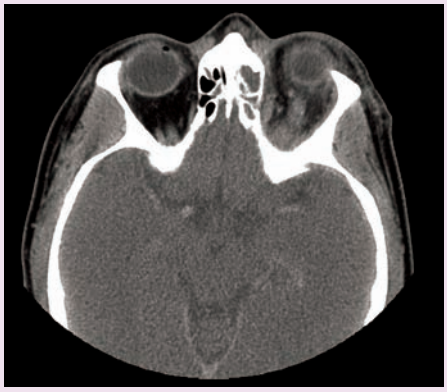
1. Spread of infection from periorbital structures (commonly the paranasal sinuses)
2. Trauma/surgery leading to direct inoculation
3. Bacteremia

3. What are the complications of OC?

- Optic nerve damage
- Vision loss
- Extraocular muscle palsy
- Osteomyelitis of skull and orbit
- Cavernous sinus thrombosis
- Meningitis

Guy's CT scans





- Both orbits can be compared using the right orbit (located on the left side of the CT image) as a control. Superiorly, the left orbit shows soft tissue attenuation evident by the depression of the superior rectus muscle. The optic nerve appears uninvolved, similar in both orbits.

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***This department covers selected points to avoid pitfalls and improve patient care by family physicians in the ED. Submissions and feedback can be sent to* diagnosis@sta.ca.**

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- Cerebral abscess
- Hearing loss
- Septicemia

4. How is OC managed?

Patients with suspected OC should be admitted to hospital immediately for intravenous (IV) antibiotics. Investigations should include complete blood count testing with differential, as well as Gram stain and cultures of any likely sources, such as secretions from the nasal cavity, conjunctiva, abscesses, fistulas and any lacerations.

Suspected patients require an orbital CT scan to confirm the diagnosis, which can identify orbital abscesses, infected sinuses and the degree of proptosis, which may not be apparent on examination due to extreme lid edema. Antibiotics are chosen depending on the most likely pathogens present. Common bacteria are *Streptococcus pneumonia*, *Staphylococcus aureus* and *Haemophilus influenza*. Appropriate antibiotics include second- and third-generation cephalosporins, such as cefuroxime, ceftriaxone and cefotaxime. If there is no response to antibiotics within 24 to 36 hours, the presence of an orbital or subperiosteal abscess, or worsening of clinical parameters (*i.e.*, decreased vision), then surgical intervention is indicated. Both the orbit and infected sinuses should be drained.

5. Things to remember:

- Patients with OC are systemically unwell, commonly presenting with a fever and malaise
- Eye movement will be restricted, whereas those with periorbital cellulitis will not
- If you suspect your patient has OC, look for causative factors, such as sinus infection, penetrating injury, bite wounds and dental abscesses
- Orbital CT scan is used to confirm the diagnosis of OC
- OC requires in-hospital care with rapid administration of IV antibiotics Dx

Acknowledgements
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References

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