"Mommy, I can't open my eye!"

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Daniella, six, presents with a two days history of increasing redness, swelling and pain around her left eye (Figure 1). A fever was recorded orally at 38.8˚C.

Figure 1. Swelling around left eye.

Medical history

Daniella's family history is unremarkable, but two weeks ago, she developed an upper respiratory infection characterized by:

- a cough,
- a fever and
- yellow discharge from both nostrils.

This was treated with a 10-day course of amoxicillin.

This condition has various causes and may be associated with serious complications. Up to 11% of cases of result in visual loss.

Physical examination

A physical examination noted that:

- Daniella had limited extraocular motility in her left eye, secondary to pain and mild exophthalmos,
- her visual acuity was 20/30 and 20/20 in her left and right eyes, respectively and
- her pupils and fundi were normal in both eyes.

Other than these findings, her physical examination was normal.

Clinical investigations

Clinical investigations showed leukocytosis (16,000 mm3) with a shift to the left.

What's your diagnosis?

a) Severly infected chalazion
b) Bacterial conjuctivitis
c) Orbital cellulitis
d) Preseptal cellulitis

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Answer: C
Orbital cellulitis

What is orbital cellulitis?

Orbital soft tissues are separated into anterior and posterior compartments by connective tissue known as orbital septum. Orbital cellulitis is an infection of the soft tissues posterior to the orbital septum, differentiating it from preseptal cellulitis, which is an infection of the soft tissue of the eyelids and periocular region anterior to the orbital septum.

Orbital cellulitis has various causes and may be associated with serious complications. Up to 11% of cases of orbital cellulitis result in visual loss; therefore, prompt diagnosis and proper management are essential.

A thorough history and physical examination are critical in establishing a diagnosis of orbital cellulitis.

Presentation

Orbital cellulitis occurs in the following three situations:

a) Extension of an infection from the periorbital structures, most commonly from the paranasal sinuses, but also from:
   - the face,
   - the globe and
   - the lacrimal sac

b) Direct inoculation of the orbit from trauma or surgery

c) Hematogenous spread from bacteremia

Orbital cellulitis is more common in children than in adults. The median age of children hospitalized with orbital cellulitis is seven to 12-years-of-age.

Diagnosis

A thorough history and physical examination are critical in establishing a diagnosis of orbital cellulitis. Patients frequently complain of:

- fever,
- malaise and
- a history of recent sinusitis or upper respiratory tract infection.

Questioning the patient about any recent facial trauma or surgery, dental work, or infection elsewhere in the body is important. Usually, patients with orbital cellulitis complain of an acute onset of red eye associated with:

- severe pain,
- blurred vision,
- headache and
- diplopia.

On examination, findings include:

- fever,
- conjuctival chemosis,
- restricted ocular motility,
- pain with eye movement,
- eyelid edema and erythema and
- exophthalmos (protrusion of the globe).

Causes

Typical organisms include:

- *Staphylococcus* and *Streptococcus* species,
- *Haemophilus influenzae* (in children),
- *Bacteroides* and
- gram-negative rods (trauma).

Fungal causes of orbital cellulitis are most commonly *Mucor* and *Aspergillus* species. Orbital cellulitis, due to fungal infections, carries a high mortality rate in patients who are immunosuppressed. Prompt recognition of the condition is critical as a delay in treatment can result in a progression of the infection which could lead to:

- orbital apex syndrome or cavernous sinus thrombosis,
- blindness,
- cranial nerve palsies,
- brain abscess and
- death (as secondary to these complications).

Treatment

Consult with an ophthalmologist

An ophthalmologist should be consulted immediately for more extensive examination, treatment and follow-up.

Hospitalization

The patient with orbital cellulitis should be promptly hospitalized for treatment. Hospitalization should be continued until the patient is afebrile and has clearly improved clinically.

Surgery

The presence of a subperiosteal or intraorbital abscess in Daniella's case was an indication for surgical drainage in addition to antibiotic therapy; however, in many cases, medical management alone is successful.

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Medical care

Medical care of orbital cellulitis consists of the proper use of appropriate antibiotics. IV broad-spectrum antibiotics should be started immediately until the choice of antibiotics can be tailored for specifically identified pathogens determined on cultures. Typically, IV antibiotic therapy should be continued for one to two weeks and then followed by oral antibiotics for an additional two to three weeks. A fungal infection requires IV antifungal therapy along with surgical debridement. Dx