

Ophthalmopproblem

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A 12-year-old boy presented with a 3-day history of increasing redness, swelling, and pain around his right eye. His visual acuity was 20/40 and 20/20 in right and left eyes, respectively. Pupils and fundi were normal in both eyes. He had limited extraocular motility in his right eye secondary to pain and mild exophthalmos. His temperature was recorded orally at 38.5°C. His medical history is important for recurrent sinusitis.

The most likely diagnosis is:

1. Preseptal cellulitis
2. Orbital inflammatory syndrome
3. Severely infected chalazion
4. Orbital cellulitis

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4. Orbital cellulitis

Orbital soft tissues are separated into anterior and posterior compartments by connective tissue known as the orbital septum.^{1,2} Orbital cellulitis is defined as infection involving the deep soft tissues around the eyeball and *posterior* to the orbital septum. Infection *anterior* to the septum is known as preseptal cellulitis.

More than 90% of orbital cellulitis cases are due to direct extension of acute or chronic bacterial sinusitis.³ Typically, infection begins in the ethmoid sinuses and spreads into the orbit. Other areas of spread include focal orbital infection, such as dacryoadenitis, dacryocystitis, and panophthalmitis, or dental infection. Orbital cellulitis can also occur secondary to orbital trauma (eg, orbital blowout fracture or a foreign body) or from complicated ocular or paranasal sinus surgery. Vascular extension due to systemic bacteremia is possible, but less common.^{2,4} Typical organisms include *Staphylococcus* and *Streptococcus* species, *Haemophilus influenzae* (in children), *Bacteroides*, and Gram-negative rods (ie, trauma).^{1,2}

Classically, patients with orbital cellulitis complain of acute onset of red eye associated with severe pain, blurred vision, headache, and diplopia. Findings on examination include fever, exophthalmos (protrusion of the globe), conjunctival chemosis, restricted ocular motility, pain on eye movement, eyelid edema, and erythema.¹⁻³ If the orbital apex is involved, visual acuity can be threatened by an associated afferent pupillary defect.²

Differential diagnosis

One differential diagnosis is preseptal cellulitis. Although patients with preseptal cellulitis have eyelid edema and erythema,^{2,5} they do not have exophthalmos, restricted ocular motility, or pain with eye movement. Sometimes, however, it can be difficult to distinguish early orbital cellulitis from preseptal cellulitis.^{2,3} When this is the case, referral to an ophthalmologist is strongly recommended.

Other orbital pathologies to consider in differential diagnosis of acute orbital cellulitis include trauma, orbital inflammatory syndrome, thyroid disease, orbital or lacrimal gland tumours, orbital varices, and orbital vasculitis.¹⁻⁵ Mucormycosis deserves special mention because it is a very severe and aggressive fungal infection characterized by blood vessel invasion, necrosis, and thrombosis. It is a potentially life-threatening disease and must be considered in any diabetic, alcoholic, or immunocompromised patient presenting with orbital cellulitis.¹

Management

Patients should be questioned about recent trauma and ear or sinus infections.⁵ In addition to a preliminary ocular examination, all patients should have their vital signs evaluated and a systemic physical examination to rule out systemic infection (ie, meningitis). Complete blood cell count and blood cultures should be ordered. Computed tomography imaging of orbits and sinuses to rule out foreign bodies and orbital or subperiosteal abscess or to confirm presence of sinus disease is also necessary.²⁻⁵

Immediate treatment is imperative and involves hospital admission for intravenous antibiotics covering Gram-positive, Gram-negative, and anaerobic organisms.⁵ An ophthalmologist should do a thorough ocular evaluation to rule out visual compromise. In addition, if CT imaging demonstrates sinus involvement, an otolaryngologist should be consulted to consider the possible benefit of sinus evacuation. In the interim, treatment with nasal decongestants might help relieve sinus congestion. For patients with orbital or subperiosteal abscess shown on CT scan, antibiotics might not be sufficient.² Although children with such abscesses have been documented to recover with antibiotics alone, adults typically require surgical drainage in addition to antibiotics.^{2,4}

Prompt recognition of orbital cellulitis is critical because delay in treatment can result in

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progression of infection that could lead to orbital apex syndrome or cavernous sinus thrombosis.^{2,3} Blindness, cranial nerve palsies, brain abscesses, and even death have been reported to occur secondary to these complications.²⁻⁵

Suspected cases of orbital cellulitis should be investigated and treated aggressively. In this case, the patient's initial investigations included an infectious organism workup with complete blood cell count and blood cultures. In addition, CT scan of the orbits and sinuses revealed chronic ethmoid sinusitis. Intravenous antibiotics were initiated immediately after hospital admission, and the patient was followed closely by his physician in conjunction with the ophthalmology consult service. An otolaryngologist was also consulted for an opinion and management of sinusitis.

Recommendations

Patients presenting with fever, inflamed eyes, and exophthalmos should be suspected of having orbital cellulitis. An immediate infectious organism workup should be initiated and antibiotics administered. An ophthalmologist should be consulted immediately for more extensive examination, treatment, and follow up. ❁

References

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