

Answer to Ophthalmology continued from page 1097

1. Orbital cellulitis

Orbital cellulitis is an infection within the orbit posterior to the orbital septum. In contrast, preseptal cellulitis is a true cellulitis confined to the superficial periocular region anterior to the orbital septum. The orbital septum is a layer of fascia that extends from the bony orbital rim to its insertion in the upper and lower eyelids.¹

Orbital cellulitis is more common in children than in adults. Median age of children hospitalized with orbital cellulitis is 7 to 12 years, and the infection has also been reported to be twice as common in boys as in girls. With prompt diagnosis and appropriate use of antibiotics, only up to 11% of cases of orbital cellulitis result in visual loss.²

Orbital cellulitis occurs in 3 main settings. Infectious extension from periorbital structures (which was the case with our patient) represents most cases, with more than 90% spreading from the ethmoid sinuses. Direct inoculation (via trauma or surgery) and hematogenous spread from bacteremia are less common causes.³

Differential diagnosis

Differentiating between preseptal and orbital cellulitis can be difficult based on inspection alone, as both conditions might present with eyelid edema and erythema. However, orbital cellulitis will have physical examination findings that result from the mass effect of infection and inflammation in the orbit. These include proptosis, ophthalmoplegia, increased intraocular pressure, pupil

abnormalities, and visual disturbances. There is also frequently a history of sinusitis.¹ If the 2 conditions cannot be differentiated clinically, imaging to rule out intra-orbital lesions is mandatory.

The differential diagnoses for preseptal cellulitis include blepharitis, conjunctivitis, and dermatitis. Careful examination of the periocular area might reveal infectious, inflammatory, or allergic causes for inflammation other than bacterial cellulitis.

The differential for orbital cellulitis comprises the many causes of orbital masses and painful proptosis, including inflammatory conditions such as orbital pseudotumour, thyroid ophthalmopathy, benign or malignant neoplastic lesions, carotid-cavernous fistula, and retrobulbar hemorrhage in the context of trauma.

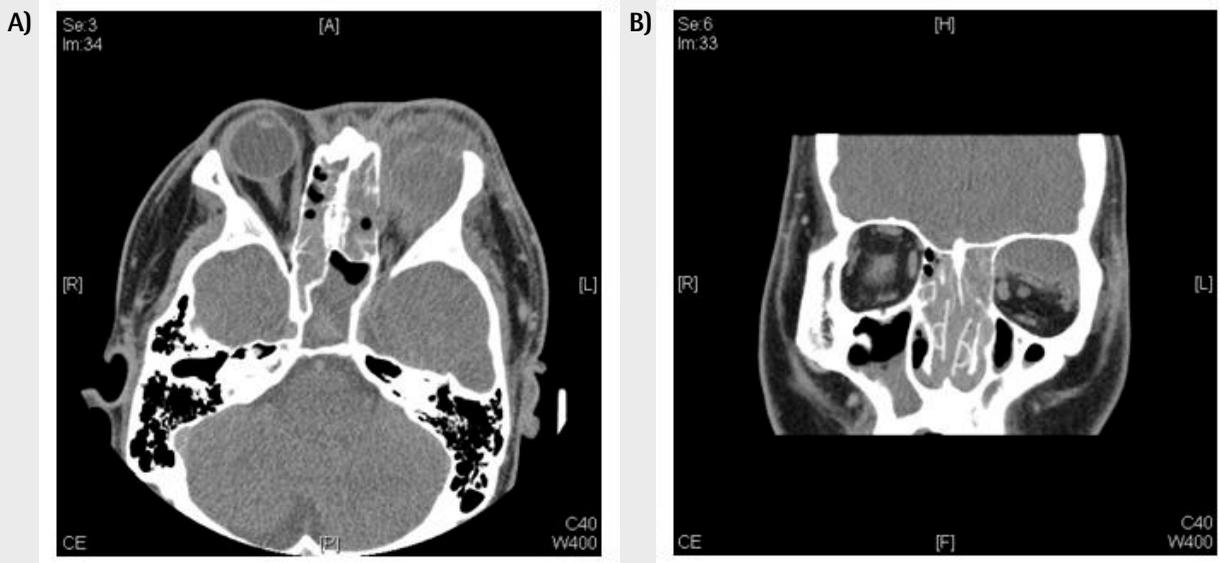
Investigations

In the case of our patient, conjunctival swab cultures grew *Staphylococcus aureus* and blood culture results were negative. There was a moderate elevation of white blood cells ($12 \times 10^9/L$). Thyroid-stimulating hormone levels were normal.

Orbital computed tomography with contrast revealed an extraconal hypoattenuating lesion in the superior left orbit, causing proptosis and inferior displacement of the superior rectus and globe (Figure 2). Extensive preseptal and postseptal soft tissue swelling with opacification of frontal, ethmoid, and maxillary sinuses was also noted.

The patient was admitted and administered intravenous antibiotics: 2 g of cefotaxime and 600 mg of

Figure 2. Computed tomography with contrast revealing superior orbital mass displacing globe inferiorly: A) Coronal image, B) axial image.



clindamycin every 8 hours and 1 dose of vancomycin. Because of the concerning changes in vision and pupillary responses, urgent operative intervention was planned. Ethmoidectomy with drainage of the orbital abscess was performed. Culture of the sinus drainage grew *S aureus* and anaerobic Gram-positive cocci. Clinically there was no change, and the postoperative computed tomographic scan showed a reaccumulation of the superior subperiosteal abscess. The patient was taken to surgery for repeat drainage through a medial external approach, allowing better access to the superior orbit. A marked clinical improvement was noted on day 5. The patient was switched to oral cephalexin and metronidazole, and was discharged on day 9.

Management

Management of orbital cellulitis consists of appropriate antibiotic therapy and judicious use of surgical intervention. **Figure 3** is a flowchart of the management

of orbital cellulitis. Indications for immediate surgery include subperiosteal or intraorbital abscess on imaging, as well as an afferent pupillary defect, decreasing vision, progressive proptosis, or failure to respond to medical therapy.^{3,4}

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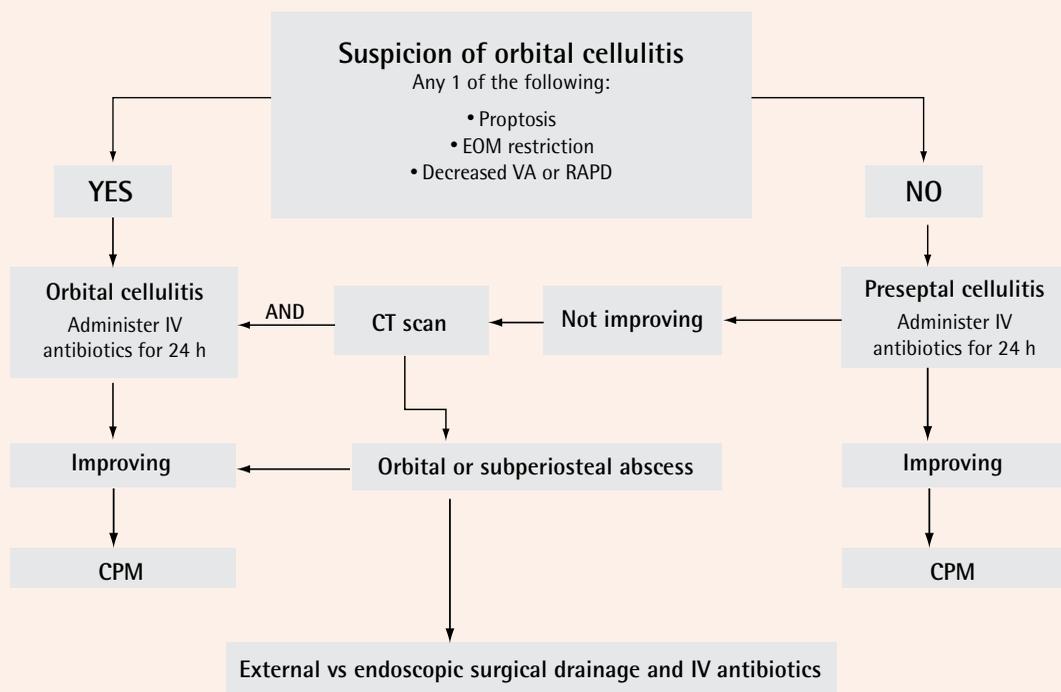
Competing interests

None declared

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Figure 3. Clinical management of orbital cellulitis



CPM—continue present management, CT—computed tomography, EOM—extraocular movement, IV—intravenous, RAPD—relative afferent pupillary defect, VA—visual acuity.