ORBITAL CELLULITIS

Eka Sutyawan, Wayan
Ophthalmology Departement
Faculty of medicine, Udayana University/Sanglah Hospital

Orbital cellulitis is an eye disease that is very dangerous. The disease is characterized by an infection that involves the tissues posterior to the orbital septum, including the fat and muscle within the bony orbit. Orbital cellulitis is a serious infection in children that can result in significant complications, including blindness, cavernous sinus thrombosis, meningitis, subdural empyema, and brain abscess. These complications have become rare in the antibiotic era, but the potential for sight or life-threatening complications makes prompt diagnosis and early treatment important.

Many of the clinical signs of orbital cellulitis are distinctive (proptosis, ophthalmoplegia), but distinguishing between periorbital (preseptal) and orbital cellulitis in young children based on clinical observations alone can be difficult. Confusion has existed in both the medical and surgical literatures about the definitions of orbital versus preseptal (peri orbital) cellulitis, entities that differ greatly with regard to pathogenesis and management strategies.

The distinction between preseptal and orbital cellulitis lies in the location and extent of the inflammatory process, and one of the major landmarks in this determination is the orbital septum. In preseptal cellulitis, the inflammatory process is localized anterior to the orbital septum, in contrast, orbital cellulitis there is involvement of the soft tissues posterior to the orbital septum, including the orbital soft tissues.

Both preseptal cellulitis and orbital cellulitis occur more commonly in the pediatric population. A common cause of preseptal cellulitis is extension

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of infection from the paranasal sinuses. Contiguous spread of infection from the soft tissues of the face and ocular adnexa are also important sources of infection and may result from trauma, foreign bodies, insect bites, skin infections (impetigo), eyelid lesions (chalazia, hordeola), and iatrogenic. There are several notable predisposing factors to the development of orbital cellulitis, including direct inoculation as a result of trauma or surgery, hematogenous spread in the setting of bacteremia, or extension of infection or inflammation from adjacent paranasal sinuses. Other notable causes of orbital cellulitis include trauma with associated orbital fracture or foreign body, dacryocystitis (nasolacrimal duct obstruction), dental infections, endophthalmitis, and untreated preseptal cellulitis.

While both preseptal cellulitis and orbital cellulitis can present with edema and erythema of the periorbital tissues. The extent of infection in preseptal cellulitis is superficial and does not extend posteriorly into the orbit. As such, patients with preseptal cellulitis will present with normal vision, absence of proptosis, and full ocular motility without pain on movement. In contrast, cellulitis orbital patients may present with severe eyelid edema, decreased vision, pain with eye movement, proptosis, and ophthalmoplegia.

Ethmoid sinusitis is the most common origin of orbital cellulitis at all ages and certainly predominates in young children who have not yet formed their frontal sinuses. Ethmoid sinusitis is the most common predisposing factor, and causative bacteria typically depend on the etiology of sinusitis. The bacteria most commonly implicated in pediatric orbital cellulitis include Streptococcus pneumoniae, Haemophilus influenzae, Moraxella catarrhalis, group A β-hemolytic streptococci, Staphylococcus aureus, other streptococcal species, and anaerobes.

The diagnosis of orbital cellulitis is best confirmed by CT scan with contrast infusion of the orbit. Despite significant advances in antimicrobial
therapies and diagnostic technologies, the management of orbital cellulitis often remains challenging, and rapid diagnosis and prompt initiation of therapy are important in minimizing complications and optimizing outcomes. Medical management focuses primarily on aggressive antibiotic therapy while treating underlying predisposing factors such as sinusitis. Medical management alone is successful in many cases. Surgical intervention may be indicated in cases of orbital cellulitis with an associated foreign body, although in cases of orbital cellulitis with an associated abscess, the precise need and timing of surgery are less clearly defined. Presence of subperiosteal or intraorbital abscess was an indication for surgical drainage in addition to antibiotic therapy.

Surgical procedures performed included endoscopic sinus surgery, ethmoidectomy, drainage of subperiosteal/orbital abscess, orbitotomy, sinus trephination, and craniectomy. General indications for surgery were progressive orbital signs and/or symptoms after 48 hours of antibiotic therapy. Surgical drainage also indicated for complete ophthalmoplegia and/or significant visual impairment (acute optic nerve or retinal compromise) or large well-defined abscesses. Other patients may receive an initial trial of intravenous antibiotics for 24–48 hours, with close monitoring. If there is no clinical improvement, a repeated CT scan and/or surgical drainage should be considered. Children ≥ 7 years old may be more likely to require drainage of orbital abscesses.

Course of the disease in orbital cellulitis very quickly and if not handled properly can certainly harm the eye. Proper diagnosis and appropriate management is essential to cure patients with orbital cellulitis. The management of orbital cellulitis, however, remains challenging, and prompt diagnosis and expeditious treatment are paramount in minimizing complications and optimizing outcomes.

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