# Periorbital and Orbital Cellulitis Summary

## **Definitions**:

Periorbital and orbital cellulitis are bacterial infections that affect the region around the eye. They may be difficult to distinguish from one another clinically as they both present with a red, painful, swollen eye. However the pathophysiology and treatment are different, therefore accurate diagnosis is essential.



## **Overview**:

	Periorbital cellulitis	Orbital cellulitis
Age	Usually < 5 years	Any age
Risk factors	Contiguous spread of infection,	Sinusitis >>orbital trauma,
	usually through break in skin	hematogenous spread
Pathogens	Staph aureus (including	Staph aureus, strep, anaerobes, H. flu
	MRSA), strep	
Clinical exam	Normal vision, ROM of eye,	Proptosis, blurred vision, or
	and no proptosis	ophthalmoplegia
Diagnosis	Usually by clinical exam	Usually by CT scan of orbits
Consultations	None	Ophthalmology (consider also ENT,
		ID)
Management	Usually Clindamycin or	Cephalosporin + Clinda or
	Bactrim to cover staph and	Unasyn + Bactrim (covers gram
	strep	positives as well as anaerobes)
		Vancomycin for severe cases
		Surgical drainage if abscess is present
Duration of	7-10 days	2-3 weeks
antibiotics		
Complications	Usually none	Vision loss, intracranial spread of
		disease, orbital or subperiosteal
		abscess, cavernous sinus thrombosis

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#### Anatomy:

The orbital septum is a thin membrane that separates the superficial eyelid from the deeper eye structures. Periorbital cellulitis, also known as "preseptal" cellulitis, is a bacterial infection of the eyelid and surrounding soft tissues that does not extend into the deeper orbital structures. In contrast, orbital cellulitis, also known as "postseptal" cellulitis, is an infection involving the fat and muscles posterior to the orbital septum.

### Clinical characteristics and pathophysiology:

Periorbital cellulitis occurs most commonly in children less than 5 years of age. It is generally unilateral and most commonly originates from contiguous spread of infection, such as from an insect bite, scratch, eczema, or dacrocystitis. In contrast, orbital cellulitis can occur at any age and is most commonly a complication of sinus. Orbital cellulitis can also occur after trauma to the orbit or via hematogenous spread.

#### Microbiology:

The most common pathogens in periorbital cellulitis are staph aureus, including MRSA, and strep. In contrast, orbital cellulitis is often polymicrobial with similar pathogens to those seen in sinusitis. These include staph, strep, anaerobes and non-typeable Hemophilus influenza. Less common pathogens include Hemophilus influenza type B and Strep pneumo (since the advent of these vaccines), Neisseria and Moraxella.

#### Physical exam:

Distinguishing orbital from periorbital cellulitis requires an experienced examiner. Both present with swelling, redness, warmth, and tenderness of the eyelid, usually unilaterally and often with accompanying fever. A patient with periorbital cellulitis has a normal examination of the globe, including normal vision, full range of motion of the eye, and no proptosis. In this situation, periorbital cellulitis is a clinical diagnosis.

Orbital cellulitis should be suspected in any patient who has proptosis, blurred vision, or ophthalmoplegia. If the vision or range of motion of the eyes cannot be properly assessed on exam, imaging and ophthalmology consultation should be strongly considered.

### Differential diagnosis:

The differential diagnosis includes allergic reactions which are often bilateral and respond to antihistamines, and periorbital edema due to hypoalbuminemia, which is usually bilateral, not red or painful, and accompanied by edema of other parts of the body. Orbital pseudotumor is an idiopathic inflammation of the orbit which presents with proptosis, eye pain, visual changes, swelling, conjunctival injection, and ophthalmoplegia. A number of tumors including retinoblastoma, rhabdomyosarcoma, and neuroblastoma, may also present with proptosis.

#### **Indications for imaging:**

CT scan should be performed on any patient whose vision or range of motion of the globe cannot be properly assessed. In addition, CT should be performed when there are visual

Created by Carrie Rassbach, MD LPCH Pediatric Hospitalist May, 2011 changes, proptosis, ophthalmoplegia, central nervous system findings, or lack of improvement after 24-48 hours of appropriate treatment. CT scan of the orbits may reveal infection extending from the sinuses into the orbital space, edema of the extraocular muscles, or an orbital or subperiosteal abscess.

### Management:

Periorbital cellulitis may be managed with antibiotics that cover suspected pathogens based on local prevalence. Either oral or parenteral antibiotics are reasonable in a patient with periorbital cellulitis, depending on the severity of presentation. Typical duration of antibiotics is 7-10 days.

Orbital cellulitis is managed as an inpatient initially with parenteral antibiotics. Ophthalmology should be consulted for all cases of orbital cellulitis with strong consideration of otolaryngology consultation as well. If infection is drained from an orbital abscess, subperiosteal abscess or sinus disease, cultures should be obtained and may help guide therapy. Empiric antibiotics should cover staph, strep, and other organisms associated with sinusitis. Reasonable regimens include a second- or thirdgeneration cephalosporin (to cover strep) plus clindamycin (to cover MRSA and anaerobes), or ampicillin-sulbactam (to cover strep and anaerobes) plus bactrim (to cover MRSA). Vancomycin should be used empirically for severe infections. Oral therapy can be considered once significant clinical improvement has been achieved for a total duration of 2-3 weeks of therapy.

## **Complications**:

Complications of orbital cellulitis include orbital or subperiosteal abscess, cavernous sinus thrombosis, vision loss, and intracranial infection.

# **References**:

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