

Distinguishing Preseptal from Postseptal (Orbital) Cellulitis

Introduction

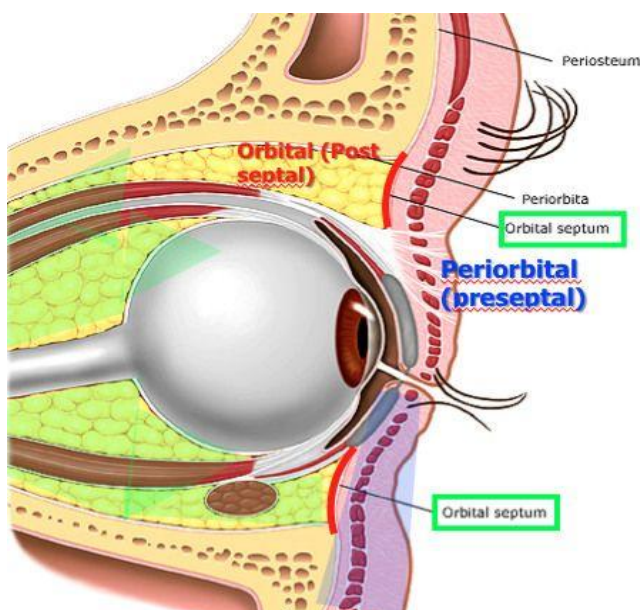
Preseptal cellulitis describes an infection or inflammation of the eyelids anterior to the orbital septum. Postseptal cellulitis (also known as orbital cellulitis) occurs posterior to the orbital septum and involves the soft tissues within the bony orbit. These processes occur most commonly following the spread of infection from adjacent structures.

Although both conditions present with periorbital oedema and erythema, it is imperative that the primary treating physician can distinguish between pre- and postseptal infections as orbital cellulitis generally has greater potential for significant morbidity and mortality. Thus, recognition of patient risk factors and distinguishing clinical characteristics can lead to vision- sparing or even life-saving treatment.

Preseptal cellulitis occurs more frequently than orbital cellulitis. Preseptal infections do not cause proptosis, motility deficits, or vision loss—signs that define orbital cellulitis. The most common cause of orbital infection and inflammation is sinusitis.

Anatomic Considerations

The orbital septum is a thin yet strong fibrous membrane that separates the preseptal from the orbital compartments. It anatomically divides the anterior preseptal eyelid tissues (skin and orbicularis) from the posterior orbital compartment. It is only fully developed after 2 years of age.

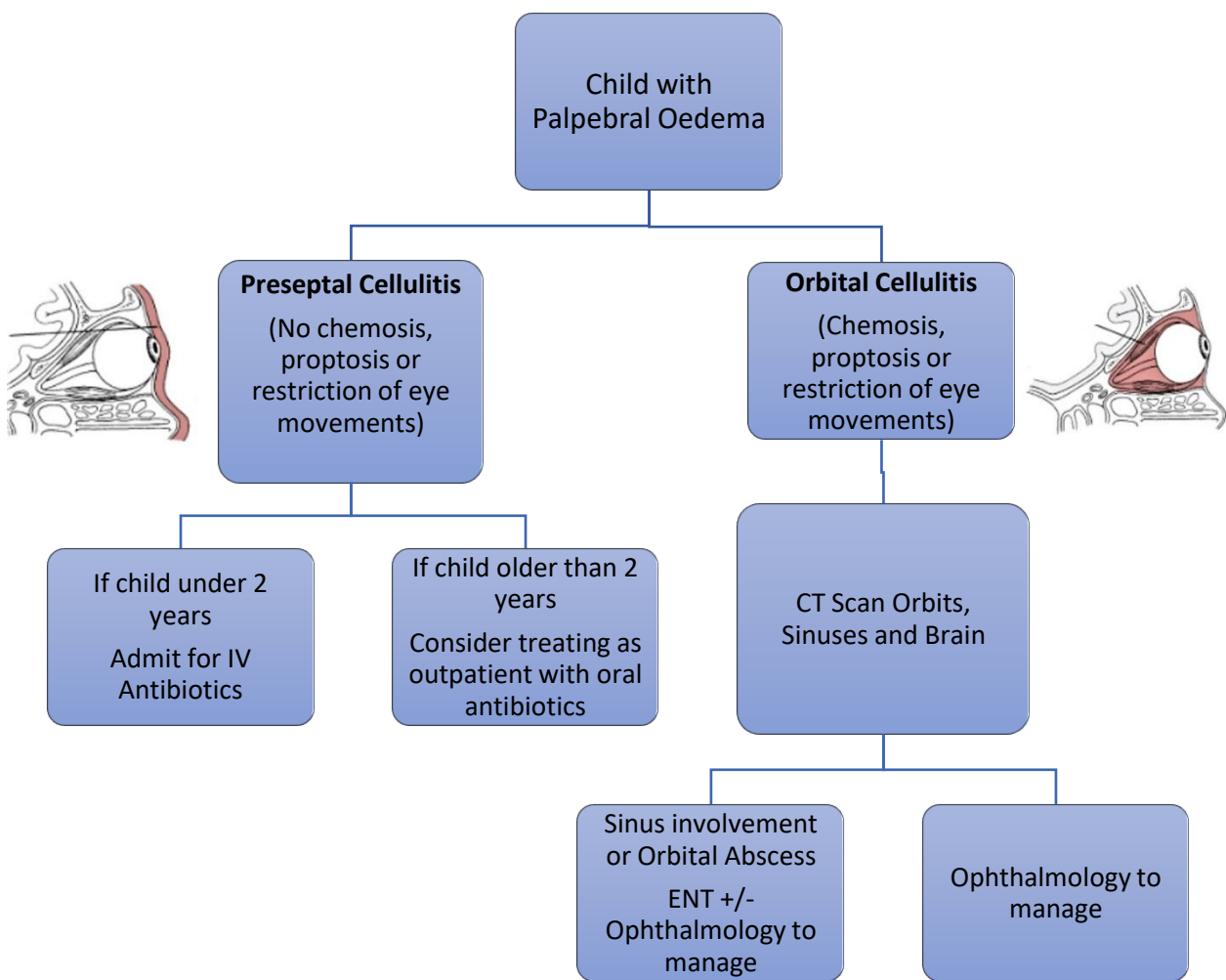


Clinical Features Comparing Preseptal and Orbital Cellulitis

Signs	Preseptal Cellulitis	Orbital Cellulitis
Oedema and erythema	Often pronounced	Often pronounced
Proptosis	None	Often present
Motility deficit	None	Motility deficit and diplopia common
Vision loss	Rare	Can be severe – check visual acuity and colour vision
Afferent Pupillary Defect	Negative	May be present – check swinging flashlight test

Red Cross Hospital Action Protocol for a Child with Palpebral Oedema

(Version 3.0)



Preseptal Cellulitis

Because preseptal infections are contained by the orbital septum, the extraocular muscles are not affected and ocular motility is undisturbed. Ophthalmoplegia and diplopia are worrisome signs and strongly suggest orbital invasion or disease progression. Likewise, because the optic nerve is unaffected in preseptal infections, visual acuity, colour vision, and pupillary function should remain normal.

Preseptal cellulitis principally occurs by one of three routes

- 1) Spread of infection from adjacent structures, including the skin (e.g. hordeola, conjunctivitis) and sinuses.
- 2) Direct inoculation following trauma.
- 3) Nonsuppurative infections due to bacterial spread from upper respiratory or middle ear infections.

Bacteriology

- 1) Staphylococcus aureus and Streptococcus pyogenes are by far the most frequent pathogens
- 2) Under 5 years (particularly under 2 years) Haemophilus influenza (bacteraemic spread from otitis media/lower respiratory tract infection)

Management

Child under 5 years

- 1) Clinically exclude/consider (and refer to MOPD if appropriate)
 - a. Otitis media
 - b. Pneumonia
 - c. Meningitis
 - d. Septicaemia
 - e. Odontogenic (teeth)
- 2) Investigations
 - a. CT orbits, sinuses and brain (with contrast) – unless very confident that no orbital cellulitis
(Ophthalmology orders the scan, D1 medical officer sedates child for scan)
- 3) Medication
 - a. Ceftriaxone IVI (50mg/kg/day in 2 divided doses)
 - b. Paracetamol PO if moderate pain
 - c. Paracetamol and Brufen PO if severe pain
- 4) Keep NPO if it looks as though will need I&D of abscess
- 5) Once responded change to oral antibiotics (TTO)
 - a. If fridge at home – Augmentin PO
 - b. If no fridge at home – Amoxicillin and Bactrim

Child older than 5 years

Mild preseptal cellulitis without shock

- 1) Manage as outpatient
- 2) Oral antibiotics
 - a. If fridge at home – Augmentin PO
 - b. If no fridge at home – Amoxicillin PO and Bactrim PO
- 3) Analgesia

Severe preseptal cellulitis

- 1) Consider CT orbits and sinuses with IV contrast if at all worried
(Ophthalmology orders the scan, D1 medical officer sedates child for scan)
- 2) Admit
 - a. Ceftriaxone IVI (50mg/kg/day in 2 divided doses)
 - b. Paracetamol PO if moderate pain
 - c. Paracetamol and Brufen PO if severe pain
- 3) Keep NPO if may need Incision and Drainage (I&D)

Orbital Cellulitis

Ophthalmic signs most frequently seen with orbital cellulitis are limited ocular motility, proptosis, chemosis, and conjunctival hyperaemia. Fever and leucocytosis are also suggestive of an orbital infection. Vision loss and an afferent pupillary defect may occur due to severe orbital congestion and optic nerve involvement. Delayed management may result in significant morbidity, including orbital apex syndrome and blindness. Cavernous sinus thrombosis, cranial nerve palsies, meningitis, intracranial abscess formation, and even death can occur without prompt aggressive treatment.

More than 90% of all orbital infections are the result of underlying sinus disease. Although sinusitis occurs more frequently in the adult population, orbital cellulitis secondary to sinus disease is seen more commonly in young adults and children.³ Orbital complications are the most common type of problem arising from acute ethmoid sinusitis.

Bacteriology

- 1) In children under 8 or 9 years old, a single organism is usually the cause of acute infections. *Staphylococcus aureus* and *Streptococcus pneumoniae* are the most commonly encountered causative organisms in young children.
- 2) Anaerobic infections are less common in the paediatric age group.
- 3) *Pseudomonas aeruginosa* and fungal organisms (invasive aspergillosis or mucormycosis) occur more commonly in immunocompromised hosts.
- 4) Group A *Streptococcus* may rarely cause necrotizing infections involving the periorbital region, and as with mucormycosis these infections may demonstrate rapid clinical deterioration.

Management

- 1) Contact ENT
- 2) Admit to ward
- 3) FBC, CRP
- 4) CT orbit, paranasal sinuses and brain with IV contrast

Medication

All patients

- 1) Augmentin IVI (or Clindamycin if Penicillin allergy suspected)
- 2) Paracetamol
- 3) Intra-nasal Iliadin 8hrly for 5 days
- 4) Intra-nasal steroid spray 12hrly (to be given 15 min after Iliadin)

If **Subperiosteal abscess** (orbital abscess)

Add Cloxacillin (50mg/kg/day in 4 divided doses)

If **Intracranial infection** (meningitis, subdural collection, intracranial abscess)

Add Ceftriaxone IV (50mg/kg/dose BD)

or Chloramphenicol (50mg/kg/day in 4 divided doses)

Add Metronidazole IV 7,5mg/kg/dose TDS

Contact neurosurgery to review

Treat until infective parameters have stabilised -vital signs, blood results, clinical picture for 5 days then change to oral antibiotics and monitor for a further day before discharge.

- a. If fridge at home – Augmentin PO
- b. If no fridge at home – Amoxicillin PO and Bactrim PO
- c. Nasal Spray as above including intra-nasal saline washes 12hrly 15 minutes prior to steroid spray

Medication doses (per dose)

Kg's	10	15	20	25	30	35	40	45	50
Panado PO QID in mls	8	12	16	20	24	500mg tab QID PO			
Brufen PO TDS in mls	3	5	7	8	10	12	14	15	16
Augmentin PO TDS in mls	4	6	8	10	12	14	16	18	20
Amoxil PO TDS in mls	<6months 2.5mls			6/12 – 10 years 5mls					
Bactrim PO TDS in mls	<6 months 2.5mls			6/12-5 years 5mls			5-10 years 10mls		
Cloxacillin IVI QID in mg	125mg	185mg	250mg	310mg	375mg	435mg	500mg	500mg	500mg
Ceftriaxone IVI BD in mg (preseptal cellulitis dose)	250mg	375mg	500mg	625mg	750mg	875mg	1000mg	1125mg	1250mg

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