CLINICAL PRACTICE GUIDELINE: Emergency Department

Preseptal and Orbital Cellulitis

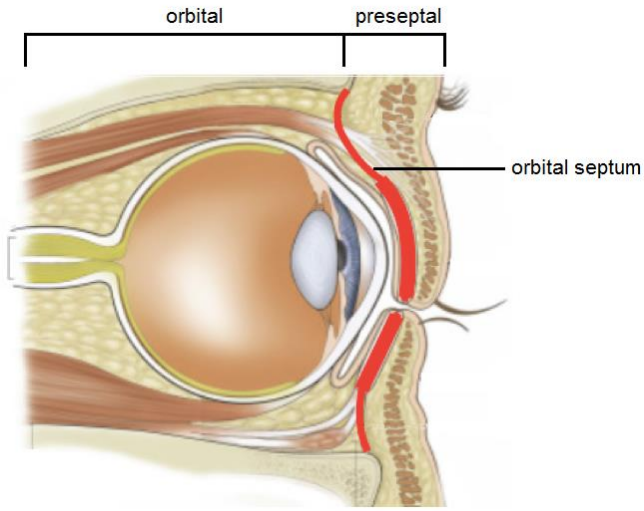
Disclaimer: This Clinical Practice Guideline ('CPG') was written for use in The Royal Victorian Eye and Ear Hospital Emergency Department. It should be used under the guidance of an Ophthalmology or ENT registrar. If clinical advice is required, please contact the Eye and Ear Admitting Officer for assistance: EYE: +61 3 9929 8033; ENT: +61 3 9929 8032. Links to internal Eye and Ear documents cannot be accessed from the website CPG.

See also: dacryocystitis, chalazion

Description:

Preseptal cellulitis is infection of the skin and subcutaneous tissues anterior to the orbital septum.

Orbital cellulitis (or 'postseptal cellulitis') is infection of the soft tissues posterior to the orbital septum, and poses risk of vision and life-threatening complications.



Background

- Preseptal and orbital cellulitis occur with higher frequency in children
- Often occurs in association with sinusitis and upper respiratory tract infection (URTI)
- Pathogens: Gram positive cocci (Staphylococcus and Streptococcus species), Haemophilus species, anaerobes

Red Flags:

- Urgent surgical intervention may be required in cases of orbital cellulitis with sinusitis, subperiosteal abscess, intraorbital abscess, or foreign body. Consult oculoplastics (OPAL) and ENT.
- Intracranial infection should be suspected in patients with headache, nausea and vomiting, altered conscious state, or multiple cranial nerve palsies.
- Children with preseptal and orbital cellulitis can rapidly deteriorate. Children <4 years of age have an incomplete orbital septum and are at risk of retrograde spread of infection from the preseptal to orbital space.
- Children who are systemically unwell requiring paediatrician input may need to be transferred to The Royal Children's Hospital (RCH). All inter-hospital transfers to and from RCH must be made consultant to consultant, involving the oculoplastics team.
- If immediate transfer/retrieval to RCH is required call ambulance or PIPER (Paediatric Infant Perinatal Emergency Retrieval - 1300 137 650)

Aetiology:

Preseptal Cellulitis	Orbital Cellulitis
• Local trauma • Infected chalazion • Dacryocystitis • URTI • Severe conjunctivitis • Recent surgery on eyelids or extraocular muscles • Endogenous seeding	• Acute sinusitis - most commonly ethmoid • Posterior extension of preseptal cellulitis • Orbital trauma, foreign material • Dacryocystitis, dacryoadenitis • Dental, facial infection • Endogenous seeding

How to Assess:

History:

- Risk factors above; ascertain immunosuppression and vaccination status (Haemophilus influenza type B (Hib))
- Acute onset of painful, swollen, red eyelids
- Orbital cellulitis: pain on eye movements, diplopia, decreased vision
- Intracranial infection: headache, nausea, vomiting, or altered conscious state

Examination:

	Preseptal Cellulitis	Orbital Cellulitis
General appearance	systemically well	may be unwell
Fever	variable	often febrile
Eyelids*	inflamed and swollen chalazia fluctuance - ?lid abscess	inflamed and swollen chalazia fluctuance - ?lid abscess
Conjunctiva	normal	chemosis
Orbital signs	normal	restricted eye movements proptosis
Optic nerve function	normal	reduced visual acuity presence of relative afferent pupil defect (RAPD) reduced colour vision reduced red saturation reduced brightness saturation abnormal visual fields
Posterior segment	normal	possible swollen optic disc choroidal folds

*Document dimensions of lid erythema and swelling

Differential Diagnosis:

- Severe conjunctivitis, chalazion, herpetic eye disease, dacryocystitis, dacryoadenitis, allergic dermatitis, Graves' ophthalmopathy, idiopathic orbital inflammatory disease

Investigations:

- Swab for microscopy, culture and viral PCR if discharge present
- Preseptal Cellulitis:
  - Investigations usually not necessary
- Orbital Cellulitis suspected:
  - Blood tests: FBE, UEC, LFT, CRP
  - Blood cultures if systemically unwell
  - CT scan (with contrast) of orbits, paranasal sinuses, and brain

Acute Management:

- Urgent
    - Keep nil by mouth until assessment complete
    - Assess tetanus immunization status and administer booster if appropriate
    - Consider transfer to general hospital if patient toxic, or suspect intracranial infection:
        - Adults: discuss with St Vincent's Hospital General Medicine Registrar, arrange ambulance transfer, consider IV antibiotics
        - Children: call ambulance or PIPER (Paediatric Infant Perinatal Emergency Retrieval - 1300 137 650) to arrange transfer/retrieval to RCH
    - Children admitted to Eye and Ear should be monitored using the ViCTOR track and trigger chart

<u>Preseptal Cellulitis</u>

- Antibiotics
    - Adults:
        - Flucloxacillin 500 mg orally, 6 hourly for 7 days
        - For adults hypersensitive to penicillins (excluding immediate hypersensitivity), use:
            Cephalexin 500 mg orally, 6 hourly for 7 days
        - For adults with immediate hypersensitivity to penicillins, use:
            Clindamycin 450 orally, 8 hourly for 7 days
    - Children:
        - Flucloxacillin 12.5 mg/kg (max 500 mg) orally, 6 hourly for 7 days
        - For children hypersensitive to penicillins (excluding immediate hypersensitivity), use:
            Cephalexin 12.5 mg/kg (up to 500 mg) orally, 6 hourly for 7 days
        - For children with immediate hypersensitivity to penicillins, use:
            Clindamycin 10 mg/kg (up to 450 mg) orally, 8 hourly for 7 days
    - If Hib infection is suspected (e.g. in unvaccinated children < 5yrs), use:
        Amoxycillin + clavulanate 22.5+3.2 mg/kg up to 875+125 mg orally, 12 hourly for 7 days
    - For children hypersensitive to penicillins (excluding immediate hypersensitivity), use:
        Cefuroxime:
            3 months – 2 years: 10 mg/kg (up to 125 mg) orally 12 hourly for 7 days
            Older than 2 years: 15 mg/kg (up to 500 mg) orally, 12 hourly for 7 days
    - If Hib infection is suspected in patients with immediate hypersensitivity to penicillins contact the St Vincent's Hospital Infectious Diseases team for antibiotic advice.

Follow up:

- Consider General Practitioner review in 7 days if mild disease OR
- Acute Ophthalmology Service (AOS) in 2-7 days as clinically indicated
- If unresponsive to oral antibiotics, or severe infection, then admit and treat as orbital cellulitis: see below

Orbital Cellulitis:

Admission

- Adults:
  - Admit under OPAL/ENT unit
- Children:
  - Admit under OPAL/ENT unit
  - Children with preseptal and orbital cellulitis can deteriorate rapidly. Children <4 years of age have an incomplete orbital septum and are at risk of retrograde extension of infection from the preseptal to orbital space.
  - Consider transfer to RCH for admission if significantly unwell, or co-morbidities (discuss with RCH team, administer IV antibiotics). Remember: all inter-hospital transfers must be made consultant to consultant involving OPAL /ENT.
- Surgical management
  - OPAL and ENT teams - for consideration of surgical management of the following:
    - Extensive sinusitis with orbital cellulitis
    - Subperiosteal or intraorbital abscess
    - Intraorbital foreign body
- Antibiotics
  - Adults
    - Ceftriaxone 2 gram IV daily AND
    - Flucloxacillin 2 gram IV 6-hourly
  - Children
    - Ceftriaxone 50 mg/kg (max 2g) IV daily and
    - Flucloxacillin 50 mg/kg (max 2g) IV 6-hourly
  - For patients with penicillin hypersensitivity contact the St Vincent's Hospital Infectious Diseases team for antibiotic advice
  - Antibiotic selection must be modified based on results of culture and sensitivity
- Monitoring
  - 4 hourly vision observations (visual acuity, pupils, colour vision)
  - If not improving after 24 - 48 hours of intravenous antibiotics:
    - Consider repeat CT to evaluate for development of abscess and need for surgical intervention
    - Discuss with St Vincent's Hospital Infectious Diseases team for advice
  - If improving (e.g. afebrile with significant resolution of orbital and optic nerve signs) change to:

    Amoxycillin + clavulanate 875 + 125 mg (child: 22.5 + 3.2 mg/kg up to 875 + 125 mg) orally, 12 hourly for a further 10 days.

Evidence Table

Author(s)	Title	Source	Level of Evidence (I – VII)
	Kanski's Clinical Ophthalmology 8th Edition 2016		VII
	Will's Eye Manual 7th Edition 2017		VII
	The RCH Periorbital and Orbital Cellulitis Clinical Practice Guideline	RCH Clinical Practice Guidelines 2017	VII
Ferguson MP, McNab AA	Current treatment and outcome in orbital cellulitis.	Australian and New Zealand Journal of Ophthalmology 1999; 27: 375-9	VI
Meshi A, Nemet AY.	Periorbital and orbital cellulitis in adults.	Journal of Oral and Maxillofacial Surgery, Medicine, and Pathology. 2014;26(4):464-7	VI
Chaudhry IA, Shamsi, FA, Elzaridi E, et al	Inpatient preseptal cellulitis: experience from a tertiary eye care centre	British Journal of Ophthalmology 2008;92(10):1337-41	VI
Atfeh MS, Khalil HS	Orbital infections: five-year case series, literature review and guideline development.	Journal of Laryngology and Otology 2015;129:670-6	VI
Howe L, Jones NS	Guidelines for the management of periorbital cellulitis/abscess.	Clinical Otolaryngology & Allied Sciences 2004; 29: 725-8	VI
Rudloe TF, Harper MB, Prabhu SP, et al	Acute periorbital infections: who needs emergent imaging?	Pediatrics 2010; 125: e719-e26	VI
Watts P	Preseptal and Orbital Cellulitis in Children: A review	Paediatrics and Child Health 2016 Jan; 1: 1-8	VII
Sharma A, Liu ES, Le TD, et al	Pediatric orbital cellulitis in the Haemophilus influenzae vaccine era	Journal of AAPOS June 2015 19(3):206-210.	VI

The Hierarchy of Evidence

The Hierarchy of evidence is based on summaries from the National Health and Medical Research Council (2009), the Oxford Centre for Evidence-based Medicine Levels of Evidence (2011) and Melynk and Fineout-Overholt (2011).

I) Evidence obtained from a systematic review of all relevant randomised control trials.
II) Evidence obtained from at least one well designed randomised control trial.
III) Evidence obtained from well-designed controlled trials without randomisation.
IV) Evidence obtained from well-designed cohort studies, case control studies, interrupted time series with a control group, historically controlled studies, interrupted time series without a control group or with case series.
V) Evidence obtained from systematic reviews of descriptive and qualitative studies.
VI) Evidence obtained from single descriptive and qualitative studies.
Expert opinion from clinician, authorities and/or reports of expert committees or based on physiology.

Version Details:	
CPG No:	CPG30.0
Responsible Executive:	Executive Director, Medical Services
Review Officer:	Director, Emergency Department
Contributor(s):	• Clinical Practice Guideline Working Group • Director Emergency Department • Consultant Emergency Department • HMO Emergency Department
National Standard:	Comprehensive Care
Version Number:	2.0
Approval Date:	02/03/2018
Next Review Due:	02/03/2023