Corneal foreign body

the royal victorian eye and ear hospital

Disclaimer

SEE ALSO: Corneal abrasion, penetrating eye injury (PEI)

DESCRIPTION

A corneal foreign body (CFB) is material lodged on or in the cornea.

HOW TO ASSESS

Red Flags:

- Exclude mechanism suggestive of penetrating eye injury (e.g. hammering, glass)
- Deep or penetrating CFB
- Exclude multiple foreign bodies (FBs), e.g. subtarsal
- CFB in visual axis
- Corneal infection – corneal infiltrate/anterior chamber (AC) reaction (cells)

On History:

- Symptoms: Pain, foreign body sensation, redness, tearing, decreased vision (if central)
- Mechanism of injury: If high speed, e.g. hammering, drilling, grinding – exclude PEI
- Document details of protective eye wear

On Examination:

Slit lamp examination may be facilitated by topical anaesthetic

- Conjunctival injection
- Evert upper lid to rule out subtarsal FB
- Foreign body details: describe FB material (organic, metallic, plastic etc.), position on cornea, depth (assess using slit beam), number, presence of rust
- Corneal infiltrate (white haze around CFB): if present indicates possible microbial keratitis
- AC cells: may indicate presence of infection
- Stain with fluorescein to check for epithelial defect or PEI
- PEI suggested by: deep or full thickness FB, Seidel test positive (fluorescein becomes diluted with aqueous), shallow or flat AC, irregular pupil, iris transillumination defect, FB in AC, lens opacity, FB visualized in vitreous or retina

Note: Must perform dilated fundus examination if suspicious of PEI by mechanism of injury or clinical signs.

ACUTE MANAGEMENT:

NOTE: CFB in visual axis

- Consider removal by an ophthalmology registrar or experienced emergency registrar/HMO
- Warn patient that they may experience decreased vision/glare following removal

Removal of CFB at slit lamp

- Explain procedure, watch for vasovagal reaction (especially in young males)
- Topical anaesthetic, e.g. oxybuprocaine, amethocaine
- Ensure patient's head is steady against head band at slit lamp, and clinician's hand is steadied against patient's cheek or slit lamp. Patient's head can be slightly rotated for better access over nose when necessary.
- Ask patient to fix gaze on one point, e.g. clinician's ear
- Methods of removal:

(Note: depth of cornea is approximately 0.5mm centrally and 0.8mm peripherally)

  - Irrigation – very superficial FBs
  - Sterile cotton bud moistened with local anaesthetic
  - Needle bevel up (25G) – needle approaches cornea horizontally. Needle may be bent at the hub using the inside of plastic cap to angle it, for easier approach to cornea. The needle can be attached to a 1ml syringe or a cotton bud to facilitate grip and for better manipulation of needle tip.

- Rust removal
  - May use burr or needle
  - Orientate burr perpendicular to cornea. Care needed as burr removes corneal tissue and may enlarge defect and result in larger scar than if needle were used. Avoid using burr in removing central CFB/rust in visual axis. Needle more precisely removes FB and rust, but small risk of corneal perforation.
  - If difficulty in removing rust, prescribe chloramphenicol ointment QID, as this can facilitate easier removal after 2-3 days
- Restain with fluorescein following removal
- Document size and depth of defect following removal
- Antibiotic drops or ointment: chloramphenicol ointment QID (blurs vision for approximately 30 mins) or eye drops QID for 3-5 days
- Consider stat dose of cycloplegic (e.g. homatropine 2%), if significantly painful or photophobic
- An eye pad is generally not used, as it can delay corneal healing. In the setting of large epithelial defect following removal of FB, a double eye pad may be used for 24 hours to reduce discomfort
- Pain management – cool compresses, regular oral analgesia (e.g. paracetamol). Warn patient to anticipate pain when anaesthetic wears off. Local anaesthetic drops should not be given to the patient to take home.

FOLLOW UP:

Indications for follow up:

- Organic matter
- Central CFB (steroids may be considered once defect healed to minimise inflammation)
- Residual rust
- Presence of infiltrate, AC cells
- Symptoms not resolved in 48 hours or worsening

DISCHARGE INSTRUCTIONS:

- Advise patient to return if increasing pain, photophobia, decreased vision
- Advise patient they will have FB sensation once the local anaesthetic wears off
- Topical anaesthetic should never be prescribed on discharge
- Education regarding use of appropriate protective eye gear
- Contact lens wearer – discard previous lens and resume contact lens wear with a fresh contact lens once eye has been asymptomatic for 1 week
- Give patient copy of Corneal Foreign Body Factsheet

REFERENCES:

Wills Eye Manual 6th Ed 2012

Oxford Handbook of Ophthalmology, Oxford University Press 2006

Anterior Eye Disease and Therapeutics A-Z. Bruce A, Loughnan, M. 2nd Ed 2011

Eye Emergency Manual 2nd ED 2009

AUTHORS:

Dr Carmel Crock, Dr Kristen Wells and CPG Working Party

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Evidence Table

Author/s	Title	Source	Level of Evidence (I – VII)	Comments
Adam T. Gerstenblith Michael P. Rabinowitz	Wills Eye Manual, 6th Edition 2012	-	**VII**	
Alastair Denniston Philip Murray	Oxford Handbook of Ophthalmology, Oxford University Press 2006	-	**VII**	
Adrian Bruce Michael Loughnan	Anterior Eye Disease and Therapeutics A-Z. M. 2nd Ed 2011	-	**VII**	
Dr Weng Sehu	Eye Emergency Manual, 2nd Edition 2009	-	**VII**	

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.

VII Expert opinion from clinician, authorities and/or reports of expert committees or based on physiology.

CPG Suite General Disclaimer

These CPGs were written for use in the RVEEH speciality Emergency Department. They should be used under the guidance of an ENT or Ophthalmology registrar, and certain medications / procedures should only be undertaken by speciality registrars.

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EYE: 03 9929 8033 ENT: 03 9929 8032