A Clinician's Guide to Ocular Trauma

Confident Assessment and Management in General Practice

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The First Assessment Can Be Sight-Saving

Injuries to the eye are a common presentation in the general practice setting.

90% of ocular trauma is estimated to be preventable.

Accurate initial assessment, good primary first aid, and prompt referral are crucial to preventing permanent vision loss.

Common Causes by Patient Group

Adults

Road traffic accidents, assault, and falls are the most common causative factors.

Children

Sports-related injuries account for 27% of all ocular trauma requiring hospitalisation.

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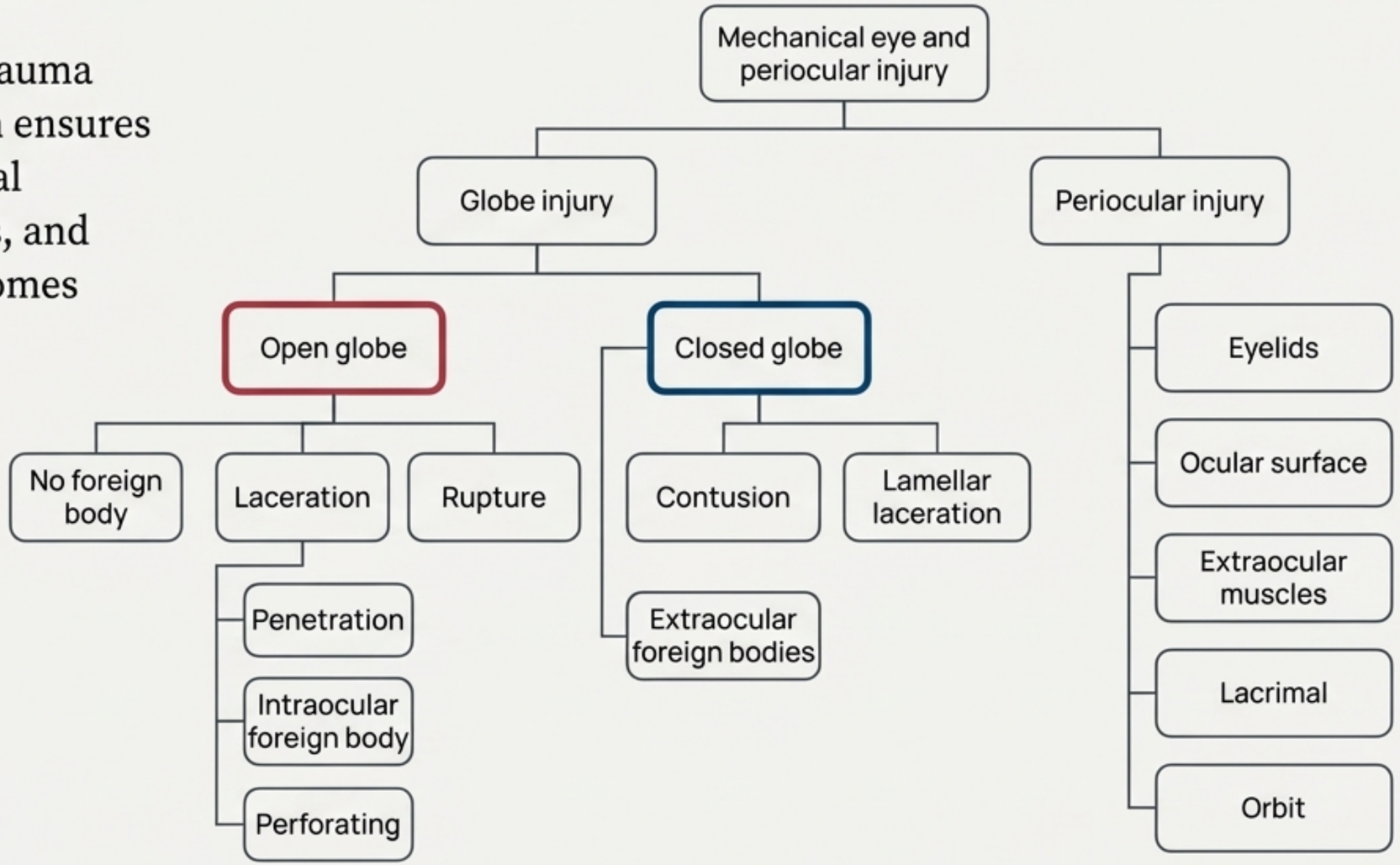
Mapping the Territory: A Common Language for Ocular Trauma

The modified Birmingham Eye Trauma Terminology (BETT) classification ensures consistent language across general practice, emergency departments, and ophthalmology services. It overcomes the “globe bias” of the original system by incorporating incorporating extraocular injuries (e.g., eyelids, orbit) alongside open and closed globe injuries.



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Field Guide: Chemical Injury

Alkali or Acid?

The most serious injuries involve alkali and hydrofluoric acid burns.

Alkali Chemicals (More Severe)

Ammonium hydroxide (fertiliser), sodium hydroxide (caustic soda), calcium hydroxide (lime).

Acid Chemicals (Less Severe)

Sulphuric acid (car battery), sulphurous acid (bleach), hydrochloric acid (swimming pool cleaning agents).

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Chemical Injury: Assessment & Action

Key Indicators (History & Examination)

- **History:** Elicit the type of substance and its contact time.
- **Examination** (After Irrigation)
  - Evert eyelids and sweep fornices for particulate matter.
  - Assess corneal and conjunctival epithelial defects with fluorescein.

Critical Sign: Look for limbal ischaemia (whitening/loss of limbal blood vessels) and corneal opacity.

Critical Actions (Management & Referral)

IMMEDIATE
Commence copious irrigation with 2L of normal saline or sterile water for at least 15 minutes. Topical anaesthesia enables adequate washing.

CHECK pH
Use litmus paper. Continue irrigation until pH normalizes to 7.0–7.2 (compare with the other eye).

URGENT REFERRAL
Any patient with limbal ischaemia or corneal opacities requires urgent referral to tertiary ophthalmic management.

DO NOT: Place an eye pad over the eye.

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Field Guide: Corneal & Conjunctival Foreign Body

? High Velocity or Low?

- The velocity at which an object was travelling towards the eye alerts to the need to exclude intraocular penetration.
- The type of object provides clues to infection risk (e.g., plant matter raises suspicion of fungal involvement).

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Superficial Foreign Body: Assessment & Action

Key Indicators (History & Examination)

- Measure visual acuity after topical anaesthesia.
- Use a slit lamp to assess the depth of the object.
- Note any white infiltrate (secondary infection).
- Use fluorescein to highlight the epithelial defect.
- **CRUCIAL STEP: Evert the upper eyelid and sweep/irrigate to find any residual tarsal foreign body.**

Critical Actions (Management & Referral)

Removal

Use a wet cotton bud or a 25G needle to pick up or lift the foreign body and any associated rust ring.

Test Integrity

Perform a Seidel test (with fluorescein) if removal was from deep corneal stroma to rule out penetration.

Medicate

Apply Chloramphenicol ointment immediately and then four times per day.

Follow-up

Re-examine in 1–3 days.

Refer If: A corneal infiltrate develops, the foreign body is on the central visual axis, or there is any suspicion of intraocular penetration.

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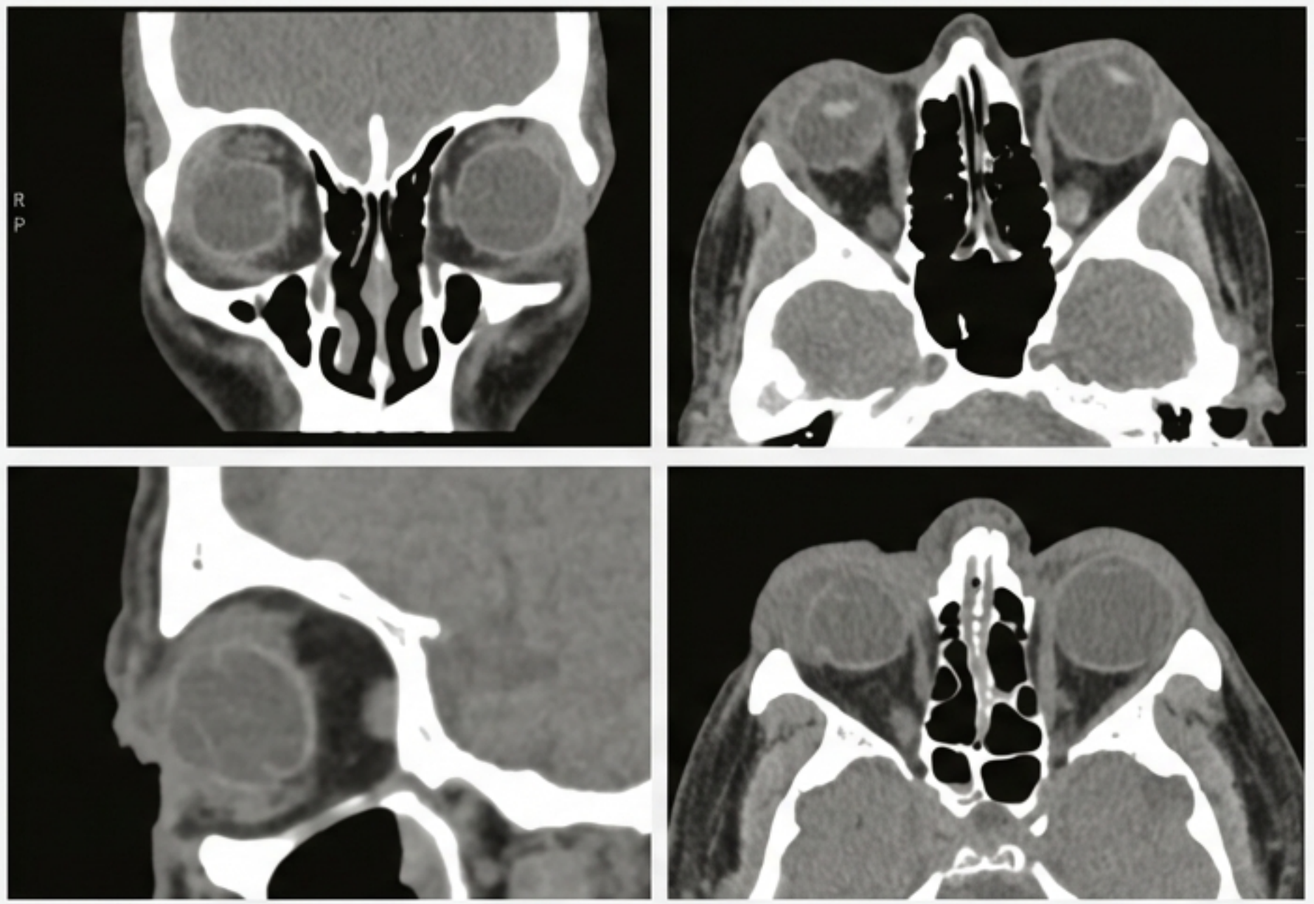
Field Guide: Orbital Fracture

Is the Optic Nerve or Muscle Entrapped?

- Visual loss may indicate a concurrent globe or optic nerve injury.
- Severe upward gaze restriction with pain, nausea, and/or bradycardia (oculocardiac reflex) may indicate entrapment of the inferior rectus muscle.
- A “white-eye blowout fracture” should be considered in patients <18 years with periocular trauma and marked vertical motility restriction.



Coronal, transverse, and sagittal CT views showing orbital fractures.

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Orbital Fracture: Assessment & Action

Key Indicators (History & Examination)

- Ask about diplopia and pain on eye movements.
- Test for a Relative Afferent Pupillary Defect (RAPD) to assess optic nerve function.
- Observe for proptosis (bulging) or enophthalmos (sunken eye).
- Palpate the orbital rim for discontinuity.
- Document ocular motility and V1/V2 trigeminal nerve sensation.

Critical Actions (Management & Referral)

URGENT REFERRAL for:

- Presence of an RAPD
- Reduced vision
- Proptosis
- Severe entrapment syndrome

Imaging

Order an orbital CT scan, specifying fine cuts and true coronal slices.

Patient Instruction

Advise the patient to avoid blowing their nose.

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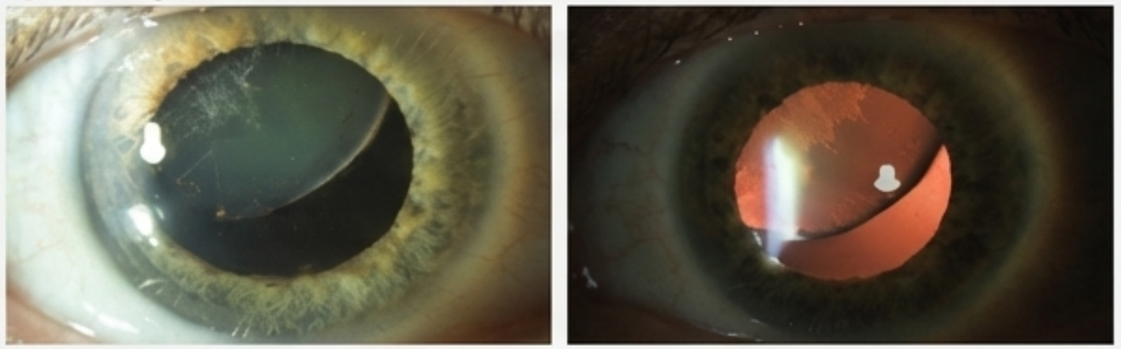
Field Guide: Closed Globe Injury (Contusion)

Key Indicators (History & Examination)

- **History:** Determine if the object was sharp or blunt.
- Examine for:
  - **Hyphaema:** Blood in the anterior chamber.
  - **Iridodialysis:** Distorted pupil from iris root dehiscence.
  - **Lens Subluxation/Dislocation:** Best seen through a dilated pupil.
  - **Loss of Red Reflex:** May indicate vitreous haemorrhage or retinal detachment.
  - **Commotio Retinae:** 'Golden sheen' in the periphery from retinal trauma.

Note: A very low intraocular pressure (IOP) may indicate an occult globe rupture.

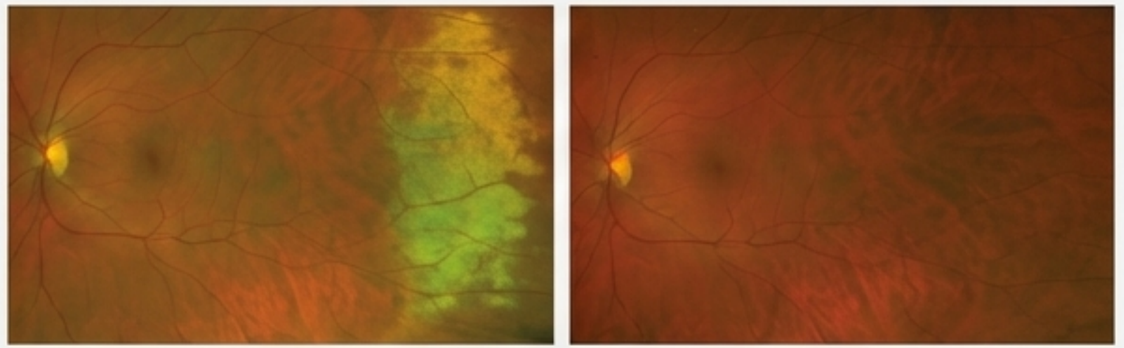


Lens dislocation due to damaged lens zonules.

Management & Referral

Refer Immediately if the patient has:

- RAPD
- Reduced vision
- Motility impairment or proptosis
- Hyphaema
- Loss of the red reflex



Commotio retinae ('golden sheen') following blunt force inju

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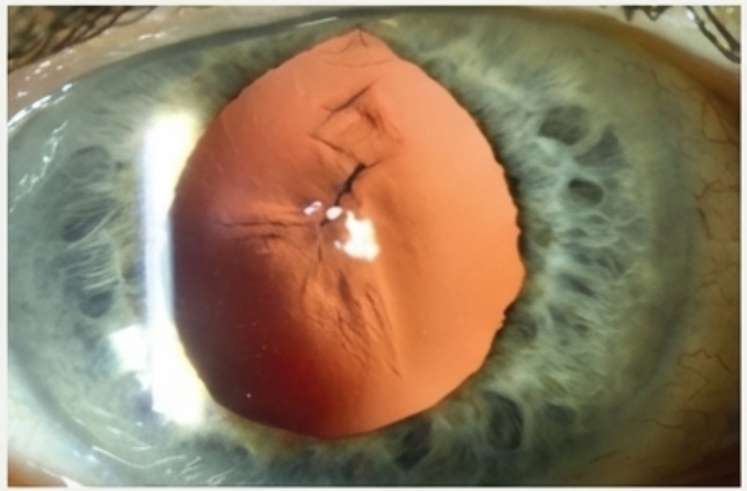
Field Guide: Open Globe Injury - A True Ophthalmic Emergency

Rupture or Full-Thickness Laceration

High Index of Suspicion

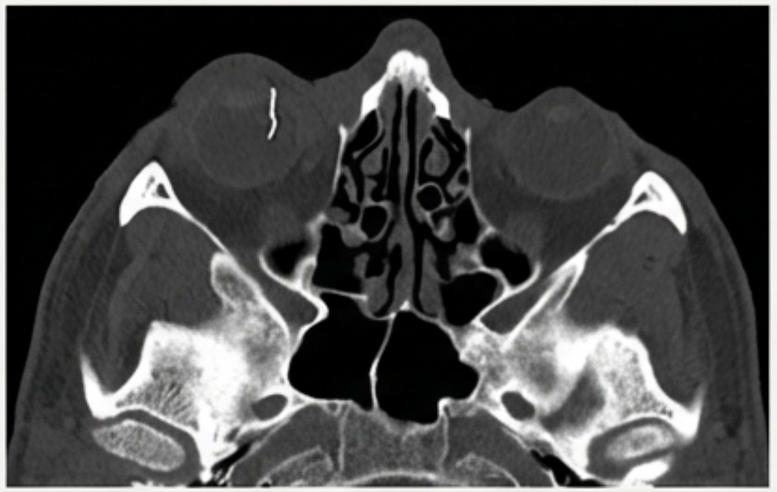
- History of nearby metal striking metal (without eye protection).
- Sharp force (penetrating injury) or severe blunt force (rupture).
- Falls in patients with a history of prior intraocular surgery.



Self-sealed corneal entry wound.

Critical Signs of Penetration

- Peaked pupil pointing towards the wound
- Positive Seidel test (aqueous leak)
- Shallow anterior chamber
- Iris or uveal prolapse
- Loss of red reflex (vitreous haemorrhage)



CT scan showing metallic intraocular foreign body.

IMMEDIATE ACTIONS

DO NOT place any pressure on the globe. Do not check IOP or motility.

DO place a rigid eye shield over the eye for protection.

DO prescribe oral ciprofloxacin 750mg twice daily while en route.

DO consider antiemetics to reduce pressure from vomiting.

DO refer immediately to an ophthalmology service.

Removed 10mm wire foreign body.

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Red Flags: When to Refer Urgently

	Finding	Suspect
	No or Poor Red Reflex	Vitreous Haemorrhage, Retinal Detachment
	Relative Afferent Pupillary Defect (RAPD)	Optic Nerve Compromise
	Peaked, Abnormally Shaped Pupil	Penetrating Injury (Iris Prolapse)
	Limbal Whitening (after chemical exposure)	Limbal Ischaemia
	Diplopia and Gaze Restriction	Orbital Fracture with Muscle Entrapment
	Proptosis or Increased Intraocular Pressure	Retrobulbar Haemorrhage

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The Critical Role of the First Responder

Prevention of permanent vision loss from eye injuries starts with your accurate assessment and early diagnosis.

1.

Systematic Assessment is Paramount

A detailed history and a structured, complete ocular examination are the foundation of effective management.

2.

Prompt Action Saves Sight

Correct primary ocular first aid and timely referral of serious injuries directly impacts patient outcomes.

3.

When in Doubt, Refer

If any uncertainty exists, onward referral is the safest and most appropriate action given the potential for serious, underlying sight-threatening pathology.

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