Eye Trauma

Eye problems are a common ED presentation (~5%)

Standard History

- Time of injury, features – pain, visual loss/change, discharge, etc
- Mode of injury:
  - Physical vs chemical
  - Superficial vs blunt
  - Speed of impact
  - Nature and size of object
- Were glasses or goggles worn?
- Possible foreign body (on the surface or penetrating)?
- Other injuries sustained and treatment received so far
- Previous acuity (even if just a rough estimate) and any eye problems
- Past medical history
- Medication (e.g. anticoagulants), allergies, tetanus immunisation

Standard Examination

- Visual acuities of both eyes (corrected with glasses or pin-hole). Snellen chart as X/Y. X=dist (m) read from e.g. 6, Y=no. on chart rep dist at least half of letters on that line should be readable with normal acuity. Best 6/5 worst 6/60.
- Eye movements
- Pupillary responses
- Examine orbits, lids (evert upper ones)
- Corneas/conjunctivae, iris, anterior chamber (hyphaema)
- Slit lamp
- Fundi
- Fluorescein
- ±Visual fields
- ±Tonometry (for glaucoma)

Lid injuries

Lacerations

- Consider need for imaging if possible FB or #
- If superficial - suture 6/0 non-absorbable, ROS 5d. Provide antibiotic cover ± ADT
- Refer if involves
  - Full thickness
  - Globe as well
  - Lid margin
  - Associated with tissue loss
  - Tear drainage system
  - Levator palpebrae aponeurosis (→ptosis)

Tissue adhesive/glued lids

Irrigate, rub freq with ABx ointment, may need to cut lashes. Do not force open.

Globe injuries

Blunt injuries

Closed globe: ± orbital wall #

Ruptured globe: Often at limbic margin (thinnest sclera – visible on slit lamp or behind insertion of rectus muscle (eye movements, loss of red reflex, vitreous bleeding).

- Full eye exam including looking specifically for:
  - Hyphaema: anterior chamber blood (level seen ant to iris if patient sitting up)
    - Mx: bed rest (elevated 30°), eye shield, cycloplegics (e.g. **atropine** 1% or **homatropine** 2-5%) bd, avoid NSAIDs, **acetazolamide**/**timoptol** if ↑IOP.
    - If <33% of ant. Chamber then good prognosis. Often clear <3d.
    - Cx: glaucoma in ~7%, rebleeding in ~10%
  - Limbic tears
  - Abnormal pupil/iris: e.g. iridodialysis - detached iris → D-shaped pupil.
  - Lens damage: subluxation or dislocation.
  - Loss of red reflex: intraocular haemorrhage or retinal detachment.
  - Signs of orbital fracture
- CT scan (axial & coronal) if # suspected
- Refer to ophthalmology (or plastics if # only) if non-trivial injury
- Rx: topical Abx

Penetrating injuries

- M>F, young>old
- Small high-velocity projectiles increase risk – e.g. hammer & chisel work
- May be little external sign of penetration
- Mx: NBM, bed rest, CT orbit, eye shield (not just pad), **no** topical Rx, ± ADT
- IV ABx – **cephalothin** & **gentamicin**
- Urgent referral to ophthalmologist

Chemical injuries

- Immediately start irrigation (Hartmann's or NS) for >30min. Continue until pH ~7.5
- Remove any residual material
- Can use topical LA & Morgan lens to aid irrigation
- Alkali more dangerous than acid as penetrates deeper.
- Degree of vascular blanching (esp at limbus) is proportional to severity
- Refer to ophthalmologist

Corneal Abrasion/Foreign Body

- Abrasion = breach of the corneal epithelium.
- Common, from scratch, rubbing of eye, contact lens, Bell's Palsy, FB (trapped under upper lid & linear scratches eye on blinking)
- Features: Painful red eye, epiphora (tearing), blepharospasm (unable to open eyes), FB
- Abrasion revealed with fluorescein
- If FB remove if possible – LA drops (**amethocaine** 0.5%), cotton bud or 25-30G needle
- Refer to ophthalmologist: burring if rust ring or plant scratches (risk of fungal infection)
- Rx: topical ABx qid, cycloplegic (**homatropine** 2-5% bd), PO analgesia x 3d
- Padding the eye after LA has worn off is **not** recommended. **Don't** send home on LA.
- Abrasion should heal in <72hrs, review if still symptomatic.

Flash burns

- Causes: Arc welding, snow blindness, sun lamp (w/o protection)
- Features: Intense pain. Red eye, blepharospasm, widespread superficial epithelial loss with fluorescein (often pin-point defects)
- Rx: topical ABx qid, cycloplegic (**homatropine** 2-5% bd), PO analgesia x 3d

NAI

Ocular features of NAI may include:

- Retinal haemorrhages
- Periocular bruising
- Subconjunctival haemorrhage
- Poor pupillary response to light
- Visual loss tends to be as a result of cerebral damage

Mandatory referral.

Orbital injuries

Blow-out fracture

- Features:
    - Bruising and oedema ± subcutaneous emphysema.
    - Infraorbital n. injury: LOS of lower lid, cheek, side of nose, upper lip/teeth/gums
    - If the muscle entrapped, restriction & pain on eye movement with diplopia
    - Diplopia may also occur due to haemorrhage and oedema within the orbit.
    - Enophthalmos may suggest possible globe rupture.
    - Other findings may include epistaxis, ptosis and trismus.
- Medial wall fracture: periorbital subcutaneous emphysema (crepitus) if nose blown.
- Lateral wall fracture – more solid so tends to occur with extensive facial damage.
- Roof fracture - less common. Assoc with minor trauma in children and major in adults.
- CT of orbits, Refer plastics or maxfac and/or ophthalmology - ?Surgery
- Mx: Ice pack, analgesia, PO/IV ABx, ADT, NBM, Don't blow nose, nasal decongestant