Ocular and Periocular Trauma

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Vision threatening signs:

- Decreased visual acuity
- Conjunctival hemorrhage 360 degrees
- Irregular pupil
- Afferent pupillary defect
- Blood in the anterior chamber
- Absence of red reflex

Orbital danger signs:

- Decreased visual acuity
- Afferent pupillary defect
- Proptosis
- Limited motility
Ocular and Periocular Trauma:
What the pediatrician needs to know

**Conjunctival hemorrhage** – is blood accumulating under and within the conjunctiva. It appears bright red and has a sharp border separating it from otherwise relatively white / uninflamed conjunctiva. It is painless and visual acuity is normal. Observe. Work up for coagulopathies if recurrent. Refer to ophthalmology only if 360 degree conjunctival hemorrhage associated with trauma.

**Corneal abrasion** – a corneal abrasion is an injury involving only the superficial layer of the cornea. It causes severe eye pain, tearing, and mild redness (but not hemorrhage) of the conjunctiva. The vision may be decreased if the abrasion affects the central cornea. The corneal abrasion stains with fluorescein. The anterior chamber and pupil appear normal.

- Use topical anesthetic to aid in examination and to confirm diagnosis (1 drop of proparacaine or tetracaine), but do not prescribe topical anesthetic for use at home
- Treat with Polytrim 1 drop qid x 3 days (ciprofloxacin if contact lens wearer) or Polysporin ointment qid x 3 days
- Stop use of contact lenses
- Follow up in 1-3 days

**Foreign bodies** of the conjunctiva and cornea - the patient complains of pain, worse with blinking. The conjunctiva may be slightly inflamed, and the eye is tearing. On the cornea, you may visualize the foreign body, and fluorescein may help make it more easily visible.
Remember that the conjunctiva covers the globe and the underside of the eyelids, so you need to examine both the white of the eye and the underside of the eyelids. Evert the upper eyelid while the patient looks down.

- **Removal**
  - Topical anesthetic
  - Irrigate copiously with sterile saline
  - Remove with moistened sterile Q tip
  - Consult ophthalmology if near central cornea
  - Topical antibiotic (such as Polytrim) 1 drop qid x 3 days
  - Stop use of contact lenses
  - Follow up in 1 day

**Hyphema** – is blood in the anterior chamber. The vision is decreased, the eye pressure may be increased causing eye pain, and the patient often experiences photophobia. The anterior chamber remains formed, not flat.

- Refer to ophthalmology
- Head of bed elevation
- Rest
- No NSAIDs

**Ruptured globe** – violation of the integrity of the eye can occur due to blunt trauma, sharp trauma, or ballistic injury (such as fireworks or a gunshot wound). Visual acuity is typically decreased, the conjunctiva will be hemorrhagic (sometimes 360 degrees), and the pupil will often
be peaked. The iris and other uveal tissues act to plug the wound, which is why the pupil often appears distorted. Do not wipe anything that appears brown off the surface of the eye, as this may actually be uveal tissue. Often, there is blood in the anterior chamber, or the anterior chamber may be flat. Various other ocular injuries can coexist with globe rupture.

- Cover eye with shield and do not examine further
- Request emergent ophthalmology consultation
- Obtain IV access
- Administer broad-spectrum IV antibiotic (for example, ampicillin with sulbactam)
- Give IV pain medication as needed
- Give nothing by mouth in anticipation of surgery under general anesthesia
- Inquire about tetanus prophylaxis

**Traumatic cataract** – is a white opacification of the lens of the eye due to (usually) blunt trauma. Visual acuity is severely decreased, but the pupil is typically round, and no laceration is visible on the surface of the eye.

**Traumatic retinal detachment or dialysis** – is when the retina separates from the underlying tissue called the retinal pigment epithelium (detachment), or when the peripheral retinal edge peels away (dialysis). These are painless. Visual acuity is decreased only if the central retina is involved. An afferent pupillary defect is present.

**Eyelid lacerations** – although the general physician can repair simple eyelid lacerations, any laceration involving the margin of the eyelid, the tear drainage system (any laceration within 5
mm of the medial canthus), or containing orbital fat (indicating a deep laceration through the orbital septum), should be repaired by an ophthalmologist. Remember the eye when dealing with an eyelid laceration: if there is a cut anywhere between the brow and the inferior orbital rim, make sure the eye itself is ok!

**Periorbital ecchymosis** – a “black eye” due to blunt trauma. Make sure that the vision, pupillary response, eye movements, and appearance of the eye are all normal. There should be no proptosis of the eyeball, only the soft tissues of the eyelid and periorbita should be ecchymotic and edematous.

- Ice
- Pain control
- Observation

**Orbital hemorrhage** – is blood accumulating in the soft tissues surrounding the globe. The globe is proptotic, the intraocular pressure is elevated, and the eye movements are limited. This can be an ocular emergency because prolonged pressure around the optic nerve compromises its blood supply.

**Extraocular muscle entrapment** due to orbital fracture – the eye muscle or, more commonly, the connective tissue surrounding the eye muscle, can become caught up in orbital fractures either acutely or due to scar tissue formation in the weeks after the injury. In children, the oculocardiac reflex can cause bradycardia, hypotension and nausea/vomiting on attempted elevation of the eye with inferior rectus entrapment in an orbital floor fracture. The diagnosis of
eye muscle entrapment is made clinically, not radiographically. The CT scan often overcalls “entrapment.”

Eye safety

Please encourage your patients to wear protective eye wear when engaging in any activities or sports that might result in eye injury, such as paintball, use of air and pellet guns, boxing, contact martial arts, baseball, tennis, etc. For any patient who has permanently decreased visual acuity in one eye, recommend polycarbonate safety spectacle wear at all times to protect the better-seeing eye.
Further reading:

1. This is a terrific reference to keep in your office:

   

   
   [http://one.aao.org/CE/PracticeGuidelines/ClinicalStatements_Content.aspx?cid=e57de45b-2e03-4fbd-9e83-02374a6c09e0](http://one.aao.org/CE/PracticeGuidelines/ClinicalStatements_Content.aspx?cid=e57de45b-2e03-4fbd-9e83-02374a6c09e0)

   