Ocular and Orbital Injuries

Ocular Manifestations of Traumatic Injury:

**Bony Orbit**  
- the orbital rim protects the eye from impact with large objects  
- rim fractures are usually functionally benign  
- blunt injury to the eye may result in damage to the orbit (blow-out fracture)

A blow-out fracture is suspected if the following signs are present:

a) emphysema derived from a medial fracture of the ethmoidal bone  
b) areas of paraesthesia suggesting infraorbital/supraorbital nerve damage  
c) limitation of eye movements particularly on upgaze and downgaze  
   resulting in diplopia  
d) enophthalmos  
e) visual loss due to fracture at or near the optic canal which damages the optic nerve

**Eyelids**

- the eyelids function to protect and lubricate the eye  
- a facial nerve palsy may result in a dry cornea  
- tear drainage may be compromised with lid-margin damage

**Lacrimal Apparatus**

- tear drainage occurs at the medial margin of the palpebral fissure primarily through the lower lacrimal punctum  
- epiphora (excess tearing) may result with a lower canalicular laceration

**Conjunctiva and Sclera**

- these must be examined for presence of lacerations  
- a subconjunctival hemorrhage with appropriate history should be considered to be a potential site of scleral perforation
Cornea

- the application of fluorescein dye will identify epithelial loss, lacerations, and foreign bodies
- intact and a subtarsal foreign body is suspected
  excessive unprotected exposure to UV light from an arc-lamp,
  to the cornea wherein ocular pain begins 6 hours following exposure and resolves in 24-48 hours

Anterior Chamber

hyphaema may result from blunt or penetrating trauma to the eye
- blunt trauma may also cause traumatic mydriasis
- loss of aqueous humor in penetrating injuries may give rise to a shallow anterior chamber angle

Iris and Ciliary Body

- laceration of the cornea or limbus may result in iris prolapse producing an irregularly-shaped pupil
- iritis may be caused by blunt trauma which produces pain, redness, photophobia, and miosis

Lens

- subluxation of the lens following blunt trauma is suggested by iridonesis (fluttering of the iris diaphragm on eye movement)
- cataracts develop quickly with direct penetrating trauma
- blunt trauma also causes a posterior subcapsular cataract within hours of injury which may be transient

Vitreous Humor

- the normal transparency of the vitreous may be compromised in the presence of hemorrhage, inflammation, or infection
Retina

- a retinal hemorrhage may develop as a result of direct or indirect
- the retina becomes white when edematous
- a retinal dialysis (separation of peripheral retina from its junction
- circumscribed hole in the macular region caused by traction from
- the vitreous on the thin macular retina) may also result from blunt
- sub-retinal hemorrhage may be caused by choroidal tearing
- resulting in sub-retinal scarring

The Examination

- this is a very important part of the examination as it will give a
- baseline measurement and thus determine a response to
- before injury
- includes palpation, inspection, lid eversion, fluorescein
- staining, and topical anesthesia (0.5% proparacaine HCl)
- suspected

- check direct and consensual response for optic nerve injury

- an orbital hematoma results in generalized restriction of
- movement
- a carotid-cavernous fistula results in proptosis and a bruit
- with limited extraocular movements
Ophthalmoscopy

- look for edema, hemorrhage, detachment, foreign body if suspected
- pupillary dilatation should be performed in all cases except in those individuals who are under neurologic evaluation or in those who may be predisposed to acute angle-closure glaucoma

Radiologic Imaging

- indicated with fractures or foreign body
- MRI should not be used when a metallic foreign body is suspected

Management/Referral

Emergency

- chemical burns require immediate irrigation and referral to an ophthalmologist

Urgent Situation (institute therapy within a few hours)

- penetrating injuries require protection with an eye shield, not a patch
- conjunctival/corneal foreign bodies require topical anesthesia and removal of the object
- corneal abrasions require anesthesia with proparacaine, gross examination, fluorescein staining, mydriasis, pressure patch, refer to the ophthalmologist
- hyphaema (25% of patients with hyphaema have other ocular injuries) requires measurement of intraocular pressure and may be a sign of globe rupture, subluxated lens, or retinal detachment
- deep lid lacerations or those involving the canaliculi must be referred to an ophthalmologist
- radiation burns require topical anesthesia, examination, topical antibiotic, mydriasis, and patching

Semi-Urgent Conditions (institute therapy within 1 to 2 days)

- orbital fracture
- subconjunctival hemorrhage in presence of blunt trauma unless globe rupture or intraocular hemorrhage is suspected
Patching

Pressure Patch

- used for serious penetrating injuries or hyphaema after foreign body removal