EYE TRAUMA: INCIDENCE

- 2.5 million eye injuries per year in U.S.
- 40,000–60,000 of eye injuries lead to visual loss
Final visual outcome of many ocular emergencies depends on prompt, appropriate triage, diagnosis, and treatment.
Marked lid swelling after blunt trauma may conceal a ruptured globe.
VISION HISTORY

- Is one eye affected, or both?
- What is your current level of vision?
- Was vision normal prior to trauma?
ADDITIONAL HISTORY

- What symptoms do you have other than decreased vision?
- How long have you had symptoms?
- Have you had any eye surgery prior to trauma?
- Details of trauma?
COMPLETE EYE EXAMINATION

• Vision
• External exam
• Pupils
• Motility exam
• Anterior segment
• Ophthalmoscopy
• Intraocular pressure
• Peripheral vision
CHEMICAL BURNS

- A vision-threatening emergency
- Immediate irrigation essential
Acute and chronic stages of alkali burn
Irrigation of chemical burns should begin immediately following contact with the substance and continue upon arrival at the emergency department.
CHEMICAL BURNS: INITIAL MANAGEMENT

- Instill topical anesthetic
- Check for and remove foreign bodies
- Institute copious irrigation
Treatment: Chemical Burns

Ocular irrigation
CHEMICAL BURNS: TREATMENT FOLLOWING IRRIGATION

- Instill topical cycloplegic and topical antibiotic
- Shield eye
- Refer promptly to ophthalmologist
Treatment: Ruptured or Lacerated Globe

Ruptured or lacerated globe
SUSPECT A RUPTURED GLOBE IF

- Severe blunt trauma
- Sharp object
- Metal-on-metal contact
Intraocular foreign body seen on CT scan

Treatment: Ruptured or Lacerated Globe
SUSPECT A RUPTURED GLOBE IF

- Bullous subconjunctival hemorrhage
SUSPECT A RUPTURED GLOBE IF

- Uveal prolapse (iris or ciliary body)
SUSPECT A RUPTURED GLOBE IF

- Irregular pupil
SUSPECT A RUPTURED GLOBE IF

- Hyphema
- Vitreous hemorrhage
SUSPECT A RUPTURED GLOBE IF

- Lens opacity
RUPTURED GLOBE

- Suspect if intraocular pressure is lowered
- Evaluate cautiously to avoid extrusion of intraocular contents
IF GLOBE RUPTURE OR LACERATION IS SUSPECTED

- Stop examination
- Shield the eye (do not patch)
- Give tetanus prophylaxis
- Refer immediately to ophthalmologist
Treatment: Ruptured or Lacerated Globe

Protective eye shields
Treatment: Hyphema

Hyphema from blunt ocular trauma
HYPHEMA: MANAGEMENT

- Assume globe is potentially ruptured
- Shield eye and refer to ophthalmologist
- Ophthalmologic management:
  - Restricted activity
  - Protective metal shield
  - Topical cycloplegic and corticosteroids
  - Possibly systemic corticosteroids or antifibrinolytic agents
HYPHEMA: COMPLICATIONS

- Rebleeding into anterior chamber
- Glaucoma
- Associated ocular injuries in 25% of patients
Blunt orbital trauma
SEVERE ORBITAL HEMORRHAGE

- Bullous subconjunctival hemorrhage
- Proptosis
- Corneal exposure
- Elevated intraocular pressure
Assess ocular motility
Assess sensation over cheek and lip
Palpate for bony abnormality of orbital rim
Treatment: Orbital Trauma

X-ray of skull (Waters or Caldwell view)  CT scan (coronal and sagittal views)
ORBITAL TRAUMA: BLOW-OUT FRACTURES

- Surgery if persistent, nontransient diplopia or poor cosmesis
- Must rule out occult ocular trauma
LID LACERATIONS

- Can result from sharp or blunt trauma
- Rule out associated ocular injury
Full-thickness eyelid laceration
Laceration involving medial third of eyelid may involve tear drainage systems.
Deep laceration of upper eyelid can damage levator muscle.
Deep laceration of upper eyelid with fat prolapse
Eyelid laceration with significant loss of tissue
SUPERFICIAL LID LACERATIONS

- Avoid lid margin retraction
- Remove superficial foreign bodies
- Rule out deeper foreign bodies
- Give tetanus prophylaxis
CORNEAL ABRASIONS: SYMPTOMS

- Foreign-body sensation
- Pain
- Tearing
- Photophobia
Fluorescein strip applied to the conjunctiva
Corneal abrasion seen in blue illumination
Foreign body lodged under upper eyelid
Corneal foreign body
Removal of corneal foreign body using magnification
Rust ring after removal of corneal foreign body (slit-lamp view)
CORNEAL ABRASIONS: TREATMENT

- Topical cycloplegic
- Topical antibiotic
- Pressure patch over eye is an option
- Systemic analgesics often needed
Placement of a pressure patch
CORNEAL ABRASIONS: CONTACT LENS WEARERS

- Remove contact lens
- Antibiotics for Gram-negative organisms
- Do not patch
- Follow up with ophthalmologist in 24 hours
CORNEAL ABRASIONS: FOLLOW-UP

- Follow up in 24 hours
- Refer to ophthalmologist if
  - Not healed in 24 hours
  - Abrasion is related to contact lens wear
  - White corneal infiltrate develops
NONTRAUMATIC RED EYE: POSSIBLE CAUSES

- Conjunctivitis
- Iritis (uveitis)
- Corneal inflammation/infection
- Acute angle-closure glaucoma
VIRAL CONJUNCTIVITIS: CLINICAL SIGNS

- Conjunctival inflammation
- Watery or mucoid discharge
- Preauricular lymphadenopathy +/-
- Usually bilateral
• Mucopurulent discharge
• Often bilateral
• Treatment:
  – Topical antibiotics
  – Warm compresses
GONOCOCCAL CONJUNCTIVITIS

- Markedly purulent
- Requires parenteral and topical antibiotics
ALLERGIC CONJUNCTIVITIS

- **Signs and Symptoms:**
  - Tearing, itching, redness,
  - +/- White, ropy discharge
  - +/- Presence of other allergy symptoms

- **Treatment:**
  - Cool compresses
  - Topical antihistamines, vasoconstrictors, mast cell stabilizers, NSAIDs
TOPICAL CORTICOSTEROID

- Avoid in routine conjunctivitis
- Steroid complications:
  - Cataract
  - Glaucoma
  - Exacerbation of herpes simplex keratitis and corneal ulcers
IRITIS: SIGNS AND SYMPTOMS

- Intraocular inflammation
- Photophobia and deep ocular pain
- Circumcorneal redness (ciliary flush)
- Pupil may be smaller
CORNEAL INFLAMMATION OR INFECTION

- Pain, foreign-body sensation
- Decreased vision
- Corneal infiltrate
ACUTE ANGLE-CLOSURE GLAUCOMA: SIGNS & SYMPTOMS

- Severe ocular pain
- Decreased vision
- Headache, nausea/vomiting
- Halos around lights
- Pupil moderately dilated
- Hazy cornea
- Elevated IOP
ACUTE ANGLE-CLOSURE GLAUCOMA: INITIAL TREATMENT

- Timolol maleate 0.5% drops
- Apraclonidine 0.5% drops
- Pilocarpine 2% drops
- Acetazolamide 500 mg IV or po, or dorzolamide 2% drops
- IV mannitol
PRESEPTAL CELLULITIS: SIGNS & SYMPTOMS

- Lid swelling and erythema
- Visual acuity, motility, pupils, and globe are normal

Treatment: Cellulitis
PRESEPTAL CELLULITIS: MANAGEMENT

- Warm compresses
- Systemic antibiotics
- X-rays if history of trauma/sinus disease
ORBITAL CELLULITIS: SIGNS AND SYMPTOMS

- Pain
- Decreased vision
- Impaired ocular motility
- Afferent pupillary defect
- Proptosis
- Optic nerve swelling
ORBITAL CELLULITIS: MANAGEMENT

• Immediate treatment
• Nasopharynx and blood cultures
• Intravenous antibiotics
• Surgery may be necessary
• Rule out mucormycosis in immunocompromised patients
Herpes zoster ophthalmicus
HERPES ZOSTER OPHTHALMICUS

- Prodromal fever and scalp tenderness
- Respect for forehead midline
- Ocular involvement
  - Corneal lesions
  - Iritis
SUDDEN, NONTRAUMATIC, MONOCULAR VISION LOSS

- Most often caused by vascular occlusion
- Less commonly caused by retinal or optic nerve lesions
Central retinal artery occlusion (CRAO)
CRAO: MANAGEMENT

- Rebreathe CO2
- Timolol maleate 0.5%
- IV acetazolamide 500 mg
- Massage globe with lids closed
- Paracentesis in some cases
TEMPORAL ARTERITIS: SIGNS AND SYMPTOMS

- Unilateral loss of vision
- Afferent pupillary defect
- Optic nerve swelling
- Scalp/forehead tenderness
- +/- Chewing pain
- +/- Polymyalgia rheumatica
TEMPORAL ARTERITIS: MANAGEMENT

- Obtain ESR and C-reactive protein
- Administer systemic corticosteroids
- Perform temporal artery biopsy
HARD CONTACT LENS ABRASIONS

- Remove contact lens
- Rule out corneal infections
- Instill cycloplegic and antibiotic
- Pressure patch
SOFT CONTACT LENS WEARER

With pain, redness, decreased vision:

• Rule out corneal ulcer (epithelial defect and stromal infiltrate)
• No patching
Corneal infiltrate and epithelial defect
Removing a hard contact lens with a suction cup
EYE TRAUMA: PATIENT CARE/ PRESERVATION OF VISION

- Timely, accurate emergency diagnosis and treatment
- Appropriate ophthalmologic referral