Ocular and Orbital Trauma

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Eye Trauma: Incidence

- 1.3 million eye injuries in the US per year.
- 40,000 of these injuries lead to blindness in the US.

Ophthalmic Emergencies

<table>
<thead>
<tr>
<th>Trauma</th>
<th>Minutes Count</th>
<th>Hours Count</th>
<th>Less Urgent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical burn</td>
<td>Compartment syndrome</td>
<td>Ruptured globe</td>
<td>Cranial penetration</td>
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<tr>
<td>Comreal abrasion</td>
<td>Foreign body</td>
<td>Blunt closed eye injuries</td>
<td>Hyphema, Traumatic chorio</td>
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<tr>
<td>Retinal tear</td>
<td>Glaucoma</td>
<td>Ruptured globe</td>
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<tr>
<td>Orbital fracture</td>
<td>Lid lacerations</td>
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Not traumatic emergencies were covered in the Red Eye and Sudden Vision loss lectures.

History

- Are one or both eyes affected?
- Vision? Vision prior to trauma?
- Other symptoms?
- Duration of symptoms?
- Any surgery prior to trauma?
- Circumstances surrounding the injury e.g. work related, MVA etc.

Evaluation

- Vision
- Inspection:
  - External exam (adnexae, globe)
  - Motility
  - Anterior segment (globe)
- Pupils (APD)
- Fundus, Intraocular Pressure,
- Confrontation VF
- Role of imaging in the evaluation

Examining the eye with a swollen lid

MRI masterfile Part 5 WM Heme Strokes.ppt
**Imaging of Orbital Trauma**

CT scan is preferable to MRI
- Bone, Rapid, Easy to monitor patient
- Foreign bodies, air, hemorrhage
- Fractures
- Cost
- Needed for an MRI

MRI
- Globe and intraocular injuries
- Orbital
  - Foreign Bodies, hemorrhage
- Traumatic Cranial Neuropathies

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**Corneal Abrasion**

- FB sensation
- Pain
- Tearing
- Photophobia

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**Corneal Abrasion: Treatment**

- Cyclogyl 1% BID
- Antibiotic qid
  - (Polytrim, Tobrex, Ocuflox)
- Pressure patch for large defects
- No patch:
  - contact lens, plant material
- Analgesic po or topical NSAID
- NOT ANESTHETICS

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**Corneal Foreign Body**

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**Foreign Body: removal**

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**Chemical Burns**

- Ocular emergency
- Alkali worse than acid
- **Immediate** irrigation!
Chemical Keratopathy

- Topical anesthesia
- Copious irrigation
- Check the fornix
- Check for foreign bodies

Chemical Burns: Initial ER Management

- Topical anesthesia
- Copious irrigation
- Check the fornix
- Check for foreign bodies

Chemical Burns: treatment after irrigation

- Topical cycloplegic
- Topical antibiotic
- Patch eye
- Prompt referral to ophthalmologist

Blunt Closed Eye Injuries

Hyphema

- Refer to an ophthalmologist
- Topical pred acetate 1%, and Atropine 1% BID
- Treat intraocular pressure if elevated
- No Aspirin
- Head elevation, bed rest
- Daily followups for days 1-5.
Closed eye injury: minor
- Spincter tear
- Traumatic Iritis

Closed eye injury: vision loss

Ruptured Globe

Risk of Rupture

Signs of Rupture

Stop Exam and Shield the Eye
Orbital Trauma

Blow out fracture: symptoms/signs
- Diplopia
- Restricted ductions
- Elevation, abduction
- V2 hypesthesia
- Rim step
- Enophthalmos
- Crepitus of the eyelid

Blowout Fractures

Medial wall fracture

Orbital Apex

Roof Fractures
Associated Facial Fractures

Zygomatico Facial Complex (zmc) Fractures

ORBITAL TRAUMA: BLOW-OUT FRACTURES

- Surgery indicated only for persistent diplopia or poor cosmesis
- Surgery can be delayed since diplopia may be transient

Lid lacerations

- Windshield-related or broken glass accidents
  - Consider foreign body and tissue loss.
- Bite wounds
  - Consider infection (e.g., rabies) and tissue loss.
  - In human bite wounds, determine the assailant’s HIV and hepatitis status.
- Caution with seemingly small penetrating lid lacerations,
  - underlying globe or intracranial trauma.
- Limited history in patients who are inebriated
- Children might conceal the details of their injury for fear of parental rebuke or implicating a playmate who caused the injury.
  - Be especially wary of underlying foreign bodies in children.
  - Consider spousal or parental abuse.

Anatomical Considerations

- Partial thickness, full thickness, location, adjacent structures
- Injury to the levator, medial canthal tendon, lateral canthal tendon, canaliculi, and supraorbital nerve.
- Orbital fat: violation of the septum and possible injury to the levator.
- Displacement/rounding of the canthal angles: canthal ligament injury.
- Medial lacerations: consider canalicular involvement.
- Superonasal lacerations: rule intracranial penetration.
- Document: Diagram and Photograph the lid laceration, if appropriate.
- CT scan to rule out foreign body.

Lid lacerations

- Full thickness
- Superficial vs Deep
Canalicular Lacerations

Deep lacerations with avulsion

Superficial Lacerations
- Avoid lid margin retraction
- Give tetanus prophylaxis
- Remove superficial foreign bodies
- Rule out deeper foreign bodies

Small penetrating lacerations

Intracranial penetration

Foreign Bodies
CT scan
- Wood, vegetable: “air-like” hypodensity
- Glass: hyperdense
- Plastics: variable
- Metals: hyperdense with streak
MRI
- Better for wood and glass

MRI masterfile Part 5 WM Heme Strokes.ppt
Foreign Body

- Identify material
- Organic: needs to come out
- Non-organic: can be left in if asymptomatic and doesn’t pose risk otherwise needs to be removed

Plastic

Orbital air v Pneumocephalus

W-Ei

Emergency Eye Problems

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<th>Traumatic</th>
<th>Ocular or systemic disease</th>
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<tr>
<td>- Corneal abrasions</td>
<td>- Sudden blindness</td>
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<tr>
<td>- Orbital fractures</td>
<td>- Acute glaucoma</td>
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<tr>
<td>- Lid, facial lacerations</td>
<td>- Red eye</td>
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<tr>
<td>- Hyphema</td>
<td>- Orbital cellulitis</td>
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<td>- Chemical injuries</td>
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<td>- Ruptured globes</td>
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Urgency

- Chemical burns (minutes)
- Central retinal artery occlusion (1-6 h)
- Angle closure glaucoma (hours)
- Ruptured globe (<5-6 hours)
- Orbital cellulitis (admission, IV Ab)