

## OCULAR EMERGENCIES OF THE ANTERIOR SEGMENT

Leonid Skorin, Jr., OD, DO, MS, FAAO, FAOCO  
Mayo Clinic Health System in Albert Lea Minnesota

- I. **Introduction**
  - A. Ocular trauma is America's number-one cause of preventable blindness
  - B. 2.5 million eye injuries in the U.S. each year
  - C. 50,000 are legally blinded in the injured eye
  - D. 73% of all eye injuries occur in males
  - E. Average age 30
  - F. Non-whites – 40% - 60% higher risk
  - G. Occupational eye injuries - 1,000 per day
  - H. Total costs (medical expenses, lost wages, legal action) surpass \$1 billion a year
  
- II. **History**
  - A. Essential documentation
    - 1. which eye was injured
    - 2. where and when the injury occurred
    - 3. how did the injury happen (record in patient's own words)
    - 4. was any first aid or emergency treatment rendered
    - 5. was patient wearing safety glasses or eye shield
    - 6. any previous history of eye injuries or eye disease
    - 7. general medical history
    - 8. immune status (tetanus immunizations)
    - 9. any allergies
    - 10. recent food and fluid intake (if general anesthesia is contemplated)
  - B. Document extent of ocular injury with drawings or photographs
  
- III. **Examination and Testing**
  - A. Ocular Examination
    - 1. Visual acuity
      - a. pinhole
    - 2. Pupils – Reverse RAPD
    - 3. Ocular alignment – motility (cranial nerve or orbital injury)
    - 4. Confrontation visual fields
    - 5. Slit lamp examination
    - 6. Tonometry – Defer in open globe injury
    - 7. Ophthalmoscopy
  - B. Additional Studies
    - 1. Scleral depression
      - a. Avoid if hyphema, open globe, orbital fracture, lid laceration
    - 2. Ultrasonography
      - a. Intraocular foreign bodies
    - 3. Conventional x-rays

4. **CT scanning**
  - a. **Readily available**
  - b. **No contrast needed**
  - c. **Safe with metal**
  - d. **Great for bony fractures**
5. **MRI scanning**
  - a. **Slower, more expensive**
  - b. **Claustrophobia**
  - c. **Do not use with metal**
  - d. **Superior for soft tissue injury**
  - e. **Can use with pregnant patient**

#### **IV. Foreign Body**

##### **A. Instrumentation**

##### **B. Technique**

1. **extent of corneal injury?**
2. **evert upper eyelid**
3. **double eversion - Desmarres lid retractor**

##### **C. Check anterior chamber**

1. **foreign body**
2. **iritis**
3. **hyphema**

#### **V. Corneal Abrasion**

##### **A. Small abrasions - no patching**

1. **Acular 0.5%, 1 drop QID x 3 days**
2. **antibiotic eye drops QID x 3 days**
3. **cycloplegia**
4. **see patient in couple days**

##### **B. Moderate abrasions**

1. **Acular 0.5%, 1 drop QID x 3 days**
2. **antibiotic eye drops QID x 3 days**
3. **cycloplegia**
4. **bandage soft contact lens**
5. **see patient next day**

##### **C. Large abrasions - pressure patch**

1. **antibiotic ointment**
2. **cycloplegia**
3. **pain medications**
  - a. **Ultram (tramadol) 50 mg QID**
  - b. **Darvocet-N 100 q 4 hrs**
  - c. **Tylenol #3 q 4 hrs**
4. **see patient next day**

##### **D. Disadvantages of pressure patching**

1. **inability to apply antibiotic, cycloplegic after patch is applied**

2. patient is rendered monocular
3. allergy to tape
4. 20% of patients will remove eye pad before the next office visit
5. cannot be used in one-eyed patients
6. cannot be used in contact lens induced abrasions
7. cannot be used if pre-existing ocular infection

## VI. Blunt Trauma

A. Iridodialysis – Iris torn off ciliary spur

B. Zonular rupture, lens subluxation or dislocation

C. Hyphema

1. 5% develop secondary glaucoma
2. 25% rebleed (2 to 5 days after injury)
3. 30% have rise in IOP during acute phase
4. 75% have angle recession
5. 7% will have corneal blood staining

D. Hyphema grading

1. Grade 0 - microhyphema
2. Grade 1 - < 25% filled
3. Grade II - 25% to 50% filled
4. Grade III - 50% to 75% filled
5. Grade IV - total ("eight-ball")

E. Hyphema treatment

1. bed rest, elevate head 30°
2. cycloplegia with Atropine 1%
3. eye shield
4. no ASA or NSAIDS
5. topical steroids for uveitis
6. aminocaproic acid (antifibrinolytic agent)
  - a. inhibits plasminogen to plasmin
  - b. 50 mg/kg q 4 hrs x 5 days
  - c. maximum 30 grams daily
7. prednisone 20 mg BID x 5 days
8. antiglaucoma medication
9. antiemetics
  - a. Tigan (trimethobenzamide) 250 mg po or 200 mg pr TID
  - b. Phenergan (promethazine) 25 – 50 mg po or pr TID
10. Non-ASA analgesics

F. Surgery

1. IOP > 50 mmHg for 5 days
2. IOP > 35 mmHg for 7 days
3. IOP > 25 mmHg for 5 days if total
4. IOP not responsive in 24 hours
5. Sickle cell anemia

G. Rebleed

1. large hyphemas

2. young patients
3. blacks and Hispanics
4. patients on ASA, NSAIDS
5. corneal blood staining

**VII. Orbital Blowout Fracture**

- A. **Signs and symptoms**
  1. diplopia
  2. orbital emphysema
  3. enophthalmos
  4. proptosis
  5. subconjunctival or lid hematomas
  6. infraorbital nerve dysesthesia or anesthesia
  7. nausea, vomiting in trapdoor fractures
- B. **Medical treatment**
  1. ice, do not blow nose
  2. Afrin NS TID
  3. antibiotic prophylaxis
    - a. Augmentin 500 mg BID x 10 – 14 days
    - b. Duricef 500 mg BID x 10 –14 days
    - c. Keflex 500 mg TID x 10 – 14 days
- C. **Surgical repair**
  1. vertical diplopia that does not resolve in 10 to 14 days
  2. positive forced duction test
  3. enophthalmos of 2 mm or greater
  4. floor fracture greater than 50% as seen on CT scan

**VIII. Penetrating/Perforating Trauma**

- A. **Definitions**
  1. Penetrating – entrance wound only
  2. Perforating – entrance and exit wounds
  3. Laceration – full-thickness wound-sharp object
  4. Rupture – full-thickness wound-blunt object
  5. Lamellar – partial-thickness wound
- B. **Signs and symptoms**
  1. poor vision
  2. Seidel sign
  3. peaked pupil
  4. hypotony
  5. hyphema
  6. extruded intraocular tissue

**IX. Eyelid Injuries**

- A. **Lacerations and perforations**
- B. **Animal bites**
  1. 4 million bitten each year

2. **children bitten on face**
  3. **80% by domestic dogs**
  4. **avulsions, lacerations, puncture, crush**
  5. **Pasteurella multocida, Staph. aureus**
- C. **Treatment**
1. **Augmentin**
    - a. **Adults 875 mg q 12 hrs x 10 – 14 days**
    - b. **Children 40 mg/kg/day x 10 – 14 days**
  2. **Keflex**
    - a. **Adults 500 mg QID**
    - b. **Children 50 – 100 mg/kg/day**
  3. **Tetanus prophylaxis**
    - a. **If < 3 doses of tetanus toxoid**
    - b. **If > 5 years since last dose**
    - c. **If immunization status unknown**
  4. **Rabies prophylaxis**
    - a. **Acute encephalomyelitis – fatal**
    - b. **Skunks, raccoons, bats, fox**
    - c. **Begin within 48 hrs**