Ocular Trauma for the Primary Care Physician

Andrew J. Hendershot, MD
Havener Eye Institute
The Ohio State University’s Wexner Medical Center

Prevalence

- 2.5 million eye injuries each year in the US
- About 75% are male
- More than 1/2 occur at home
- Most commonly in the yard or garden
Relevance

- Often those with “minor” eye injuries will first seek evaluation and treatment from their primary care physician.
- Prevention and education is quick and can make a large impact.

Subconjunctival Hemorrhage

![Eye with subconjunctival hemorrhage]
Subconjunctival Hemorrhage

- Red eye - patient usually without symptoms
- Often noted by someone else
- Segmental or more rarely 360 degrees
- Bright red blood

Subconjunctival Hemorrhage

- Etiology
  - Often minor trauma
  - Valsalva (coughing, sneezing, etc)
  - More rarely - HTN, bleeding disorder
## Subconjunctival Hemorrhage

<table>
<thead>
<tr>
<th><strong>History</strong></th>
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<tbody>
<tr>
<td>Very important to elicit any history of trauma to assess risk of more serious injury</td>
</tr>
<tr>
<td>Check visual acuity</td>
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<table>
<thead>
<tr>
<th><strong>Treatment</strong></th>
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<tbody>
<tr>
<td>Usually none or artificial tears as needed for comfort</td>
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<tr>
<td>Do NOT need to stop anti-coagulation medications</td>
</tr>
<tr>
<td>Should resolve in 2-3 weeks, if not need ophthalmic evaluation</td>
</tr>
</tbody>
</table>
Corneal Abrasion

Image from http://www.wikipedia.org/

Corneal Abrasion

Image from http://www.wikipedia.org/
Corneal Abrasion

- Sharp pain - foreign body sensation
- Photophobia
- Tearing
- May decrease vision depending on location
- Defect stains with fluorescein and cobalt blue light

Corneal Abrasion

- Blunt or sharp trauma
- Eye or eyelid rubbing
- Recurrent erosion (history)
- Evert the lids to look for foreign body
## Corneal Abrasion

### History
- Details about activity patient was doing when injury occurred
  - Any high velocity projectiles?

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## Corneal Abrasion

### Treatment
- Ciprofloxacin ophthalmic drops or ointment Q2-Q4H
- Ophthalmic referral / follow-up (24 hrs)
Chemical Injury

- Irrigation should be started before anything else (even vision or history)
- Saline or LR
- Tetracaine drop first, then eyelid speculum
- Sweep upper and lower fornices
Chemical Injury

- After 30 min, wait 5 min, then check pH if possible
- Repeat until pH is neutral (~7.0)

Chemical Injury

- Exam findings range from mild injection, to severe injection, to a white eye.
- Epithelial defects vary with severity
- Eyelid swelling
### Chemical Injury

- **History**
  - What substance(s) involved
  - Any treatment / irrigation at time of injury
  - Eye protection at time of injury
  - Wearing contact lens?

### Chemical Injury

- Emergent same day ophthalmic evaluation
Corneal / Conjunctival Foreign Bodies

- Foreign body sensation
- Tearing
- History of trauma or at risk activity
- Visualize FB, injection, chemosis

Image from http://www.wikipedia.org/
## Corneal / Conjunctival Foreign Bodies

- **History:** determine mechanism of injury - determine risk of high risk projectile
- **Vision:** may need tetracaine first
- **Limited exam until there is confirmation that there is no perforation**

## Corneal / Conjunctival Foreign Bodies

- **Treatment**
  - Ophthalmic referral for removal and evaluation
  - Antibiotic (floroquinolone) drop Q2H until appointment
Corneal / Conjunctival Foreign Bodies

- Signs of perforation
- Peaked pupil
- Blood (hyphema) or white cells (hypopyon) in the anterior chamber

Peaked Pupil

Image from http://www.wikipedia.org/
Hypopyon

Image from http://www.wikipedia.org/

Hyphema

Image from http://www.wikipedia.org/
### Hyphema

- Eye pain
- Blurred vision
- Photophobia
- History of blunt trauma

### Hyphema

- Typically visible without slit lamp
- Red or black in color
- May look like distorted pupil
### Hyphema

- History - mechanism, eye protection, time of injury, time of vision loss / recovery
- Medication use (ASA, plavix, warfarin)
- History or family history of sickle cell

### Hyphema

- Emergent referral for ophthalmic care
- Can result in very high eye pressure
- Proper treatment requires multiple topical and sometimes systemic therapy
Eyelid Laceration

- Location and depth determine type of repair and need for further examination and imaging
Eyelid Laceration

- High velocity or high force mechanisms can also damage the globe, a complete eye exam is needed prior to repair
- This type of injury may also require brain and orbit imaging

Eyelid Laceration

- All eyelid margin lacerations should be repaired by an ophthalmologist or oculo-plastic surgeon
Prevention

• Proper eye protection can save a patient’s sight
• Most home activities = “ANSI Z87.1”
  • American National Standards Institute
• Make eye protection a part of your standard accident prevention discussion!

Image from http://www.wikipedia.org/
The Red Eye

Rebecca Kuennen, MD
Assistant Professor Ophthalmology
The Ohio State University’s Wexner Medical Center

Red Eye: Possible Causes

- Trauma
- Chemicals
- Infection
- Allergy
- Systemic Conditions
  - Stevens-Johnson Syndrome
  - Rheumatoid Arthritis
  - Sarcoid

Images from http://www.wikipedia.org/
Referral Criteria

- Loss of Vision
- Pain
  - Especially when not relieved by topical anesthetics
- Corneal opacity
- Pupillary distortion
- Circumlimbal injection
- Intraocular inflammation
- Recent injury or surgery

Red Eye Disorders: Non-Vision Threatening

- Hordeolum
- Chalazion
- Blepharitis
- Conjunctivitis
- Subconjunctival Hemorrhage
- Dry Eyes
- Episcleritis
- Corneal Abrasion
**Hordeolum**

- Infection involving glands of Zeis (external or stye) or meibomian glands (internal)

![](http://www.wikipedia.org/)

**Chalazion**

- Chronic, lipogranulomatous inflammation of the Zeis or meibomian glands

![](http://www.wikipedia.org/)
# Hordeolum & Chalazion Treatment

- **Goal**
  - To promote drainage
- **How**
  - Acute/Sub-acute
    - Hot compresses
    - Topical antibiotics/ointments
    - Oral antibiotics
  - Chronic
    - Refer to ophthalmology (Possible I & D)

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# Blepharitis

- A chronic inflammation of the lid margin
- **Types**
  - Staphylococcal
  - Seborrheic
    - May also be on scalp and eyebrows
  - A combination
- **Symptoms**
  - Foreign-body sensation
  - Burning
  - Mattering

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Blepharitis Treatment

- **Lid Hygiene**
  - Hot compresses
  - Lid/lash cleansing with non-irritating shampoo
  - Antibiotic ointment (erythromycin) qhs for 2-3 weeks
  - Oral tetracycline or doxycycline
    - Reserved for refractory cases

If persists refer to Ophthalmologist

Conjunctivitis

- Inflammation of the conjunctiva
- Caused by bacteria, viruses, allergies, and tear deficiency
- Diffuse injection
- +/- Discharge

<table>
<thead>
<tr>
<th>Discharge</th>
<th>Causes</th>
</tr>
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<tbody>
<tr>
<td>Purulent</td>
<td>Bacteria</td>
</tr>
<tr>
<td>Stringy, white mucus</td>
<td>Allergies</td>
</tr>
<tr>
<td>Clear with preauricular lymphadenopathy</td>
<td>Viruses</td>
</tr>
</tbody>
</table>

Image from http://www.wikipedia.org/
Conjunctivitis

- If It Burns – It’s Dry
- If It Itches – It’s Allergy
- If It’s Sticky – It’s Bacteria

Image from http://www.wikipedia.org/

Conjunctivitis – Bacteria

- Purulent discharge
- No preauricular node
  - Except Chlamydia

<table>
<thead>
<tr>
<th>CAUSES</th>
<th></th>
</tr>
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<tbody>
<tr>
<td>Staph epi</td>
<td>H. flu</td>
</tr>
<tr>
<td>Staph aureus</td>
<td>Moraxella</td>
</tr>
<tr>
<td>Strep pneumo</td>
<td>Infant forms</td>
</tr>
</tbody>
</table>

Image from http://www.wikipedia.org/
Conjunctivitis – Bacteria Treatment

- Mild purulent discharge and a clear cornea
  - Topical antibiotic drop for 5-7 days
  - Topical antibiotic ointment
- Follow-up after 2-4 days
- Refer if:
  - No improvement or worse
  - Decreased vision
  - Photophobia
  - Pain

Conjunctivitis-Bacterial
Neisseria gonorrhoeae

- Rapid onset
- Hyperpurulent
  - Frequent irrigation of conjunctiva
- Corneal infiltrates, melting, perforation
- Topical and systemic antibiotics
  - IV or IM ceftriaxone

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Conjunctivitis - Allergic

- Stringy, white discharge
- No preauricular node
- Associated conditions
  - Hay fever, asthma, eczema
- Contact Allergy
  - Chemicals or Cosmetics
- Tx: Topical antihistamines, tears to relieve itching
- Refer Refractory Cases

Conjunctivitis - Viral

- Discharge
  - Serous or watery
- Preauricular node, URI, fever, sore throat
- Causes
  - Adenovirus #1
  - HSV, Varicella, CMV
  - MMR, EBV
  - Influenza A, Molluscum
  - Enterovirus, Coxsackievirus
Conjunctivitis – Viral Treatment

- No specific tx
- Self-limited
- Cool compress
- Hand washing
- Isolation if work with public
- Resolves in 10-14 days
- Refer if pain, photophobia, or decreased vision


Subconjunctival Hemorrhage

- Red eye, good vision, and no pain
- No treatment, just reassurance
- If first episode, coagulation studies not indicated

## Dry Eye Syndrome

- **Associated conditions**
  - Aging
  - RA, Sjogrens, SJS
  - Systemic Meds
- **Symptoms**
  - Burning
  - FB sensation
  - Reflex tearing
- **Treatment**
  - Artificial tears
  - Lubricating ointment
  - Punctal occlusion

## Episcleritis

- **Inflammation of episclera**
  - Loose connective tissue b/w conj and sclera
- **Associated redness and tenderness**
- **Etiology is often idiopathic**
- **Tx: Supportive**
# Red Eye Disorders

**Vision Threatening**

- Orbital Cellulitis
- Scleritis
- Infectious Keratitis
- Iritis
- Acute Angle Closure Glaucoma
- Chemical Burn
- Hyphema
- Corneal or Conjunctival Foreign Body

## Cellulitis

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<th>Preorbital</th>
<th>Orbital</th>
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<tr>
<td>- Cellulitis of extraocular structure w/ tenderness, erythematous, and edema of lid</td>
<td>- External redness and swelling</td>
</tr>
<tr>
<td>- Normal vision, pupils, and motility</td>
<td>- Impaired and painful ocular motility</td>
</tr>
<tr>
<td></td>
<td>- + Proptosis</td>
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<tr>
<td></td>
<td>- + Optic nerve pressure with decreased vision, APD, and disc edema</td>
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Preorbital and Orbital Cellulitis

• Management
  – IV Antibiotics ASAP
  – Hospitalization
  – Blood culture
  – Orbital CT
  – Ophthalmology consult
  – ENT consult to evaluate sinus drainage
**Cellulitis Treatment**

- **Preorbital**
  - Oral antibiotics to cover Staph, Strep, H. flu
  - Frequent follow-up or refer to Ophthalmology

- **Orbital**
  - IV antibiotics STAT-cover Staph, Strep, H. flu
  - Surgical debridement if no improvement, fungus, or subperiosteal abscess
  - Complications: optic nerve damage, cavernous sinus thrombosis, and meningitis

**Scleritis**

- **BORING PAIN, wakes patient up from sleep**
- **Can be associated with collagen vascular disease**
- **Tx: NSAIDs and Steroids**
Bacterial Keratitis

- Red, painful eye
- Purulent discharge
- Penlight exam may reveal opacity
- Decreased vision
- Emergency referral
- No topical anesthetics

Contact Lens Associated Keratitis
Viral Keratitis

- Unilateral or bilateral blepharoconjunctivitis
- Watery discharge
- Skin vesicles (HSV)
- Enlarged preauricular lymph node
- Photophobia
- Decrease vision

Viral Keratitis (HSV)

- Corneal involvement usually unilateral
- Red eye
- Foreign body sensation
- Tearing
- Refer if a dendrite is seen
Herpes Zoster Ophthalmicus

- 1st Division Trigeminal Nerve
  - V1
- Nasociliary branch involvement
  - tip of nose
  - increases likelihood of ocular disease

Treatment for Viral Keratitis

- HSV- Topical antiviral
  - Consider PO antiviral agents
- HZV- PO antiviral agents
  - Consider topical antiviral if nose is involved
  - Possible steroids
- Misc Viral- Supportive
  - Artificial tears and ointment
  - Cool compresses
### Topical Steroid Side Effects

- Elevate IOP
  - Steroid-induced glaucoma
- Potentiate fungal corneal ulcer
- Cataracts
  - Long term use
- Can potentiate corneal perforation

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### Iritis

#### Signs and Symptoms

- Decreased vision
- Pain and photophobia
- Circumlimbal redness
- Miotic pupil

#### Rule Out

- Trauma
- Systemic inflammation
- If Iritis is suspected – refer to Ophthalmology
### Acute Angle-Closure Glaucoma

- Characterized by a sudden rise in IOP in a susceptible individual with a dilated pupil
- Signs & Symptoms
  - Severe ocular pain
  - Frontal headache
  - Blurred vision
  - Halos around light
  - Nausea & vomiting
  - Fixed mid-dilated pupil
  - Firm globe

### Acute Angle Closure Glaucoma Treatment

- Ophthalmology consult ASAP (for LPI)
- Topical beta-blocker q15min x 2
- Topical alpha-blocker q15min x 2
- Topical Steroid q15min x 4 then q1h
- + Topical Pilocarpine 1-2%
- Diamox 500 mg PO bid, can use IV 1st
- IV Mannitol
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<td>• Red eyes are a common presentation to the primary care physician and treatment can be initiated for many of these disorders</td>
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<tr>
<td>• Avoid steroid drops and no Rx for topical anesthetic drops</td>
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<tr>
<td>• Handle recently traumatized eyes carefully</td>
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<tr>
<td>• Look for warning signs and symptoms of sight threatening conditions</td>
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<tr>
<td>• Know when to refer to ophthalmologist</td>
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