Ocular Trauma for the Primary Care Physician

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

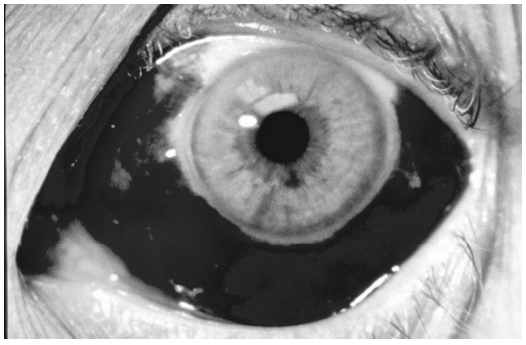
Prevalence

- **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



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

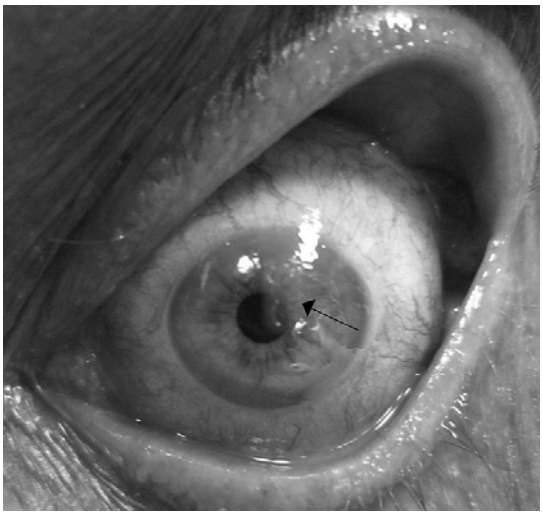
Subconjunctival Hemorrhage

- History
  - Very important to elicit any history of trauma to asses risk of more serious injury
- Check visual acuity

Subconjunctival Hemorrhage

- Treatment - usually none or artifical tears as needed for comfort
- Do NOT need to stop anti-coagulation medications
- Should resolve in 2-3 weeks, if not need ophthalmic evaluation

Corneal Abrasion



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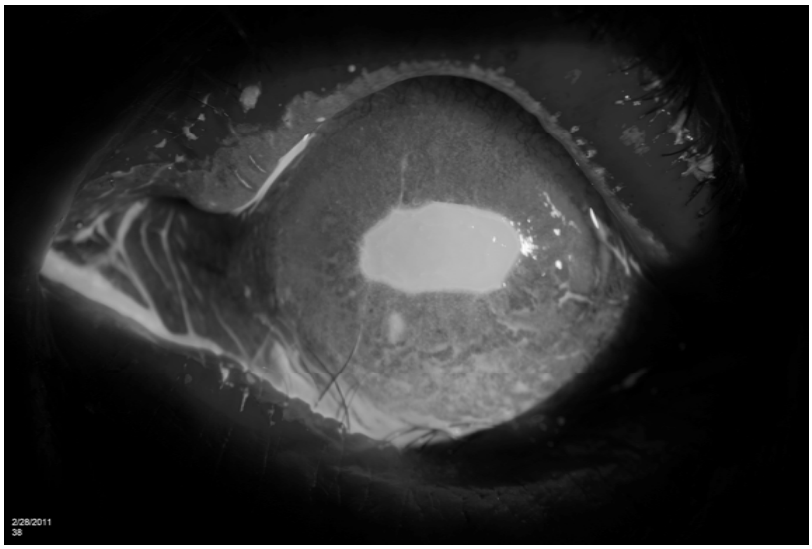
Corneal Abrasion



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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?

Corneal Abrasion

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

Chemical Injury

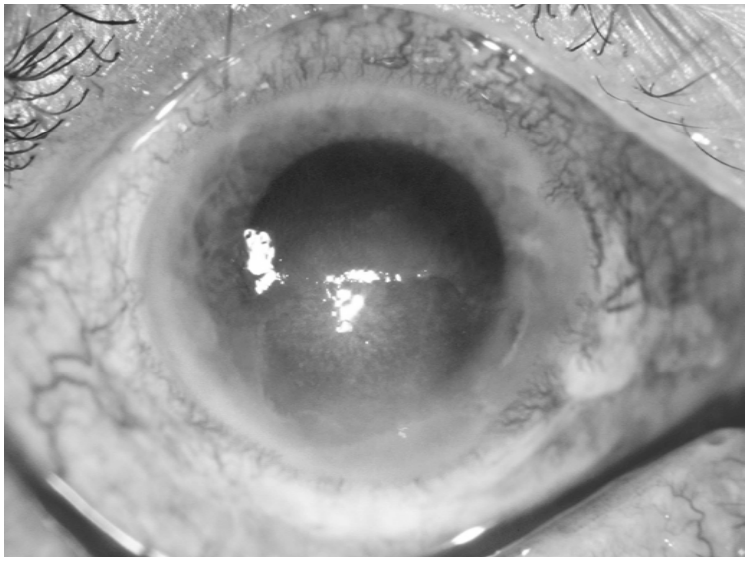


Image from http://www.wikipedia.org/

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

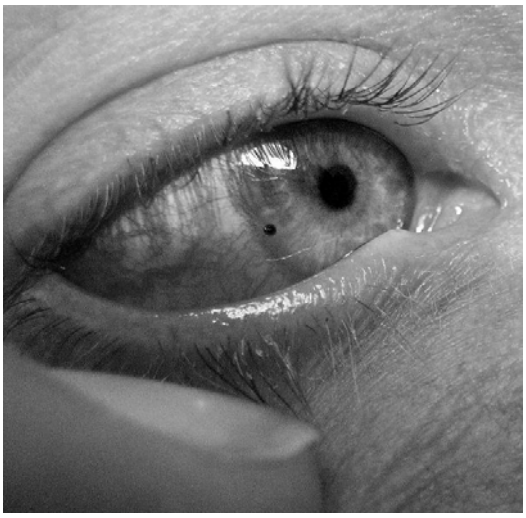
Chemical Injury

- 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



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Corneal / Conjunctival Foreign Bodies

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

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**

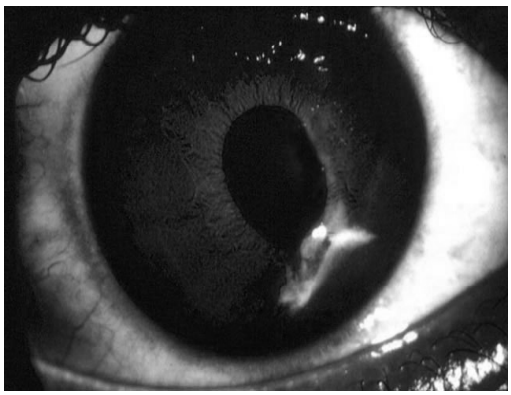
Corneal / Conjunctival Foreign Bodies

- **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



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Hypopyon

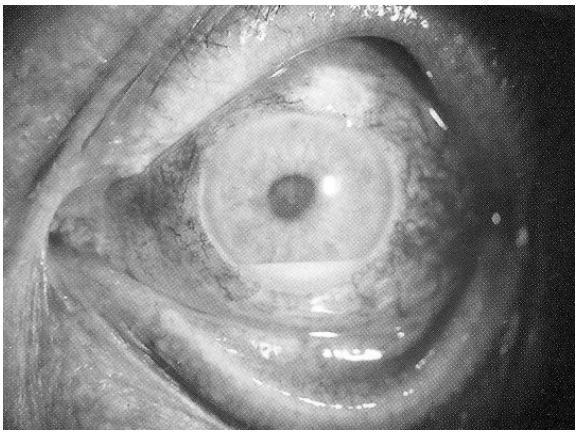


Image from http://www.wikipedia.org/

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

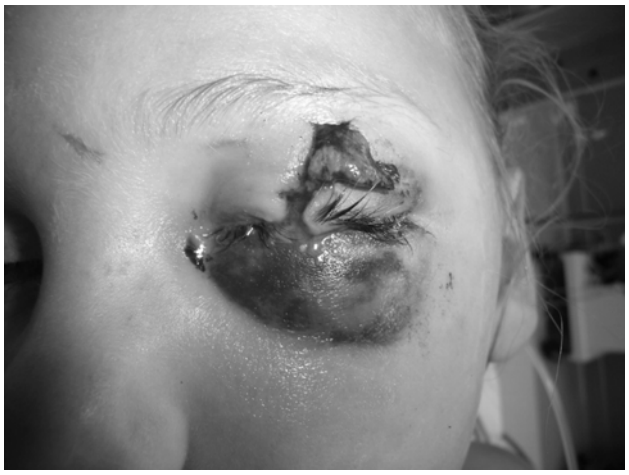
Hyphema

- 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



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!

Prevention

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

The Red Eye

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

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

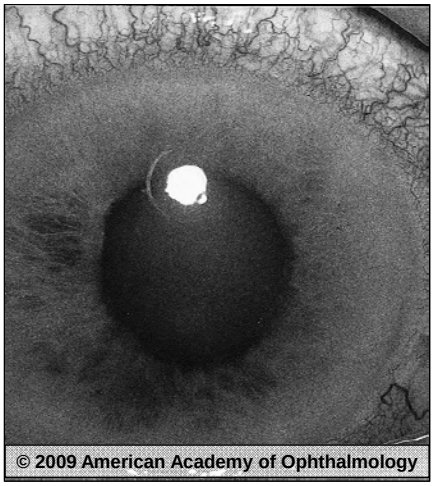
Red Eye: Possible Causes

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

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

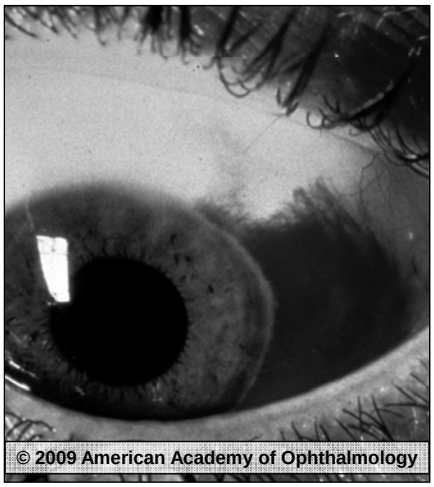
Referral Criteria

- 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



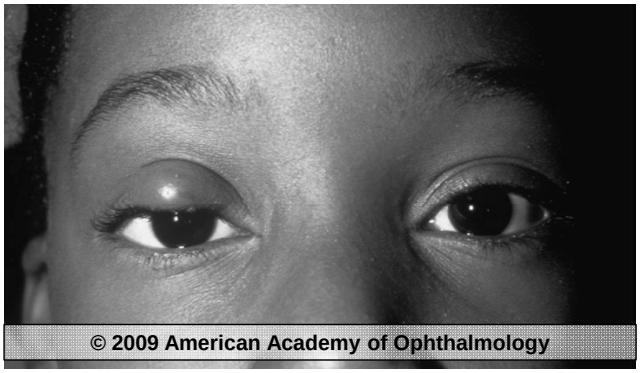
Hordeolum

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

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

Chalazion

- **Chronic, lipogranulomatous inflammation of the Zeis or meibomian glands**

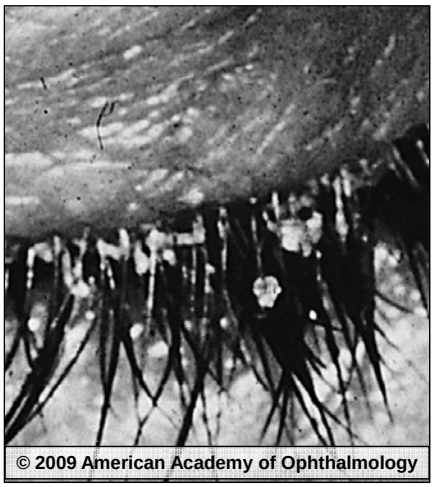


Hordeolum & Chalazion Treatment

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

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



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**

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

Discharge	Causes
Purulent	Bacteria
Stringy, white mucus	Allergies
Clear with preauricular lymphadenopathy	Viruses

Conjunctivitis

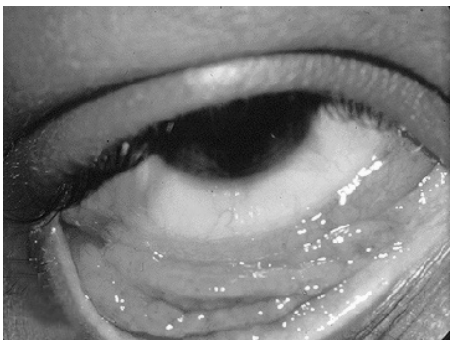
- **If It Burns – It's Dry**
- **If It Itches – It's Allergy**
- **If It's Sticky – It's Bacteria**

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

Conjunctivitis – Bacteria

- **Purulent discharge**
- **No preauricular node**
  - **Except Chlamydia**

CAUSES	
Staph epi	H. flu
Staph aureus	Moraxella
Strep pneumo	Infant forms



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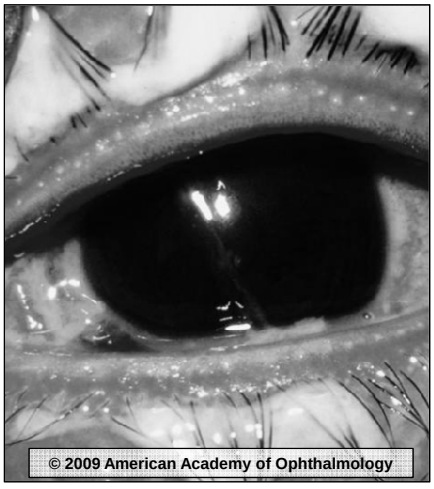
Conjunctivitis – Bacteria Treatment

- 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



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

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

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

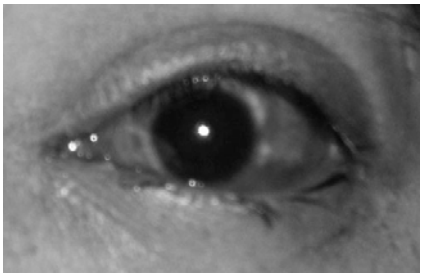


Image from http://www.wikipedia.org/

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

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

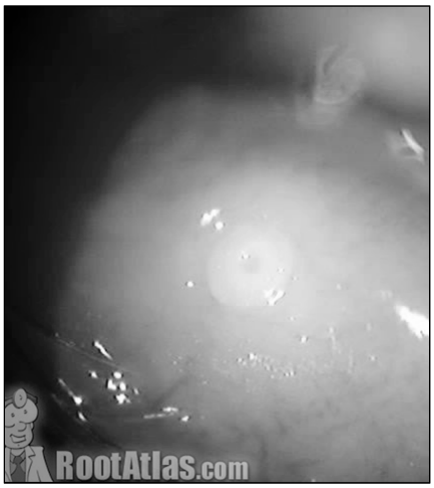
Subconjunctival Hemorrhage

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

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

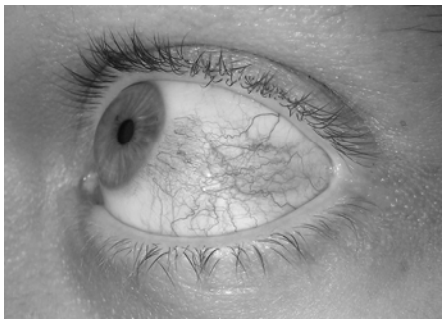
Dry Eye Syndrome

- 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



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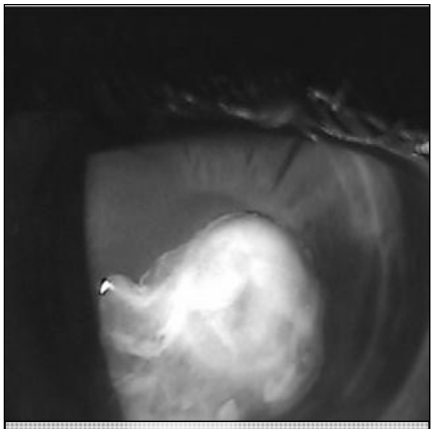
Red Eye Disorders Vision Threatening

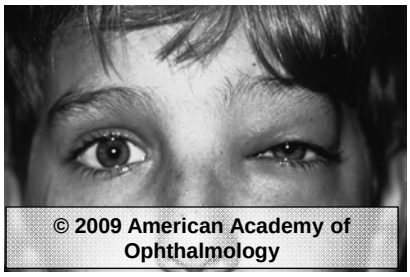
- Orbital Cellulitis
- Scleritis
- Infectious Keratitis
- Iritis
- Acute Angle Closure Glaucoma
- Chemical Burn
- Hyphema
- Corneal or Conjunctival Foreign Body

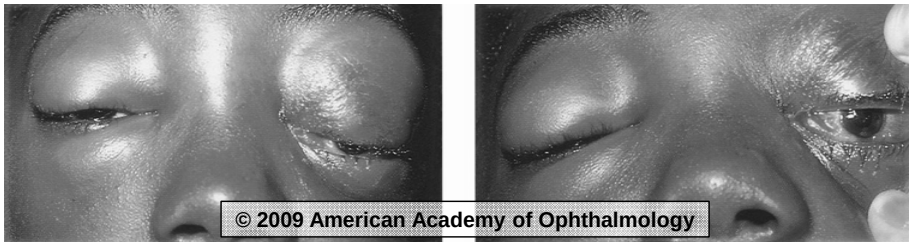


Cellulitis

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

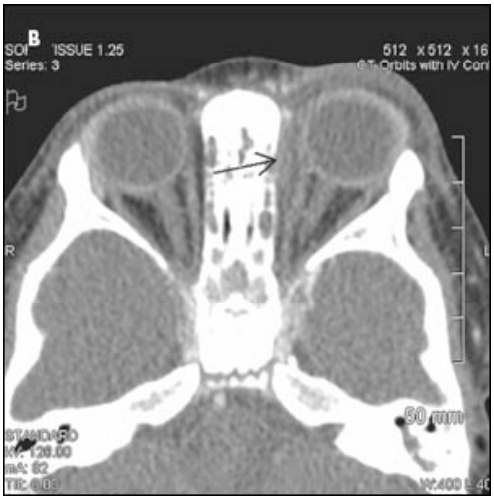
Preorbital and Orbital Cellulitis





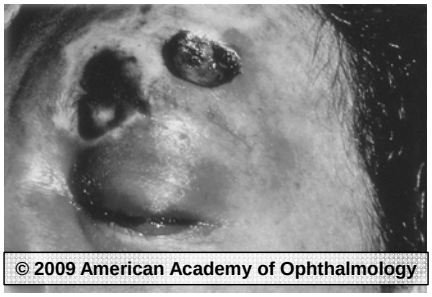
Orbital Cellulitis Management

- **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



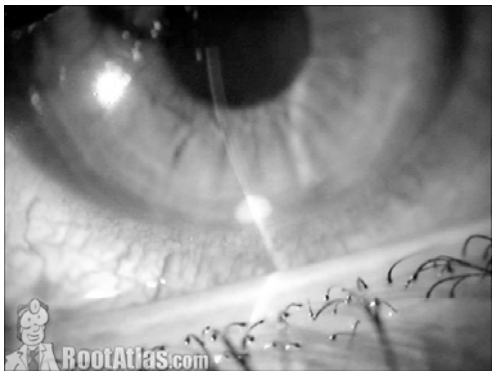
- Orbital
  - IV antibiotics STAT-cover Staph, Strep, H. flu
  - Surgical debridement if no improvement, fungus, or subperiosteal abscess
  - Complications: optic nerve damage, cavernous sinus thrombosis, and meningitis

Scleritis

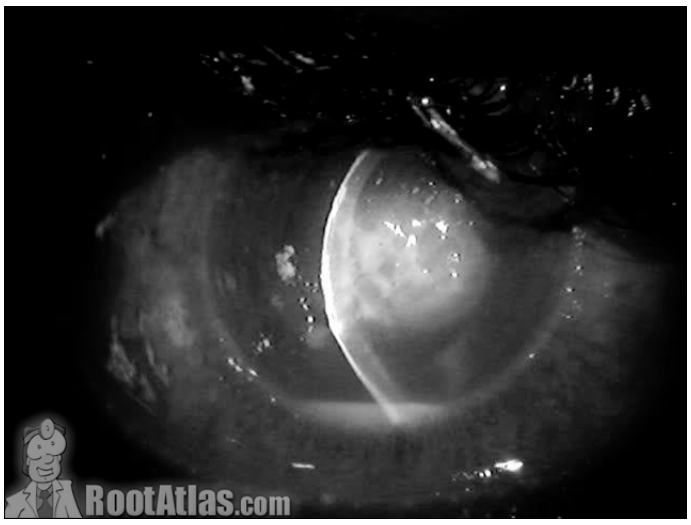
- BORING PAIN, wakes patient up from sleep
- Can be associated with collagen vascular disease
- Tx: NSAIDs and Steroids

Bacterial Keratitis

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

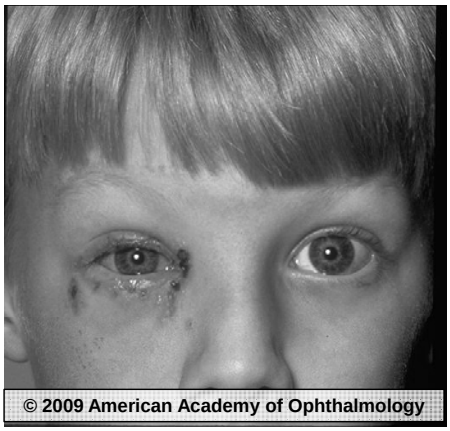


Contact Lens Associated Keratitis



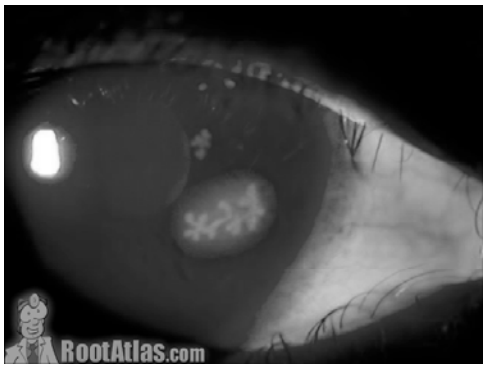
Viral Keratitis

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



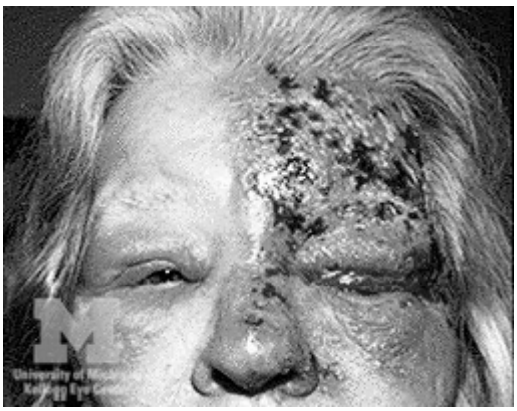
Viral Keratitis (HSV)

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



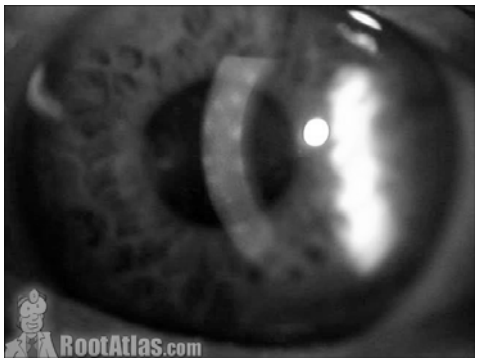
Herpes Zoster Ophthalmicus

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



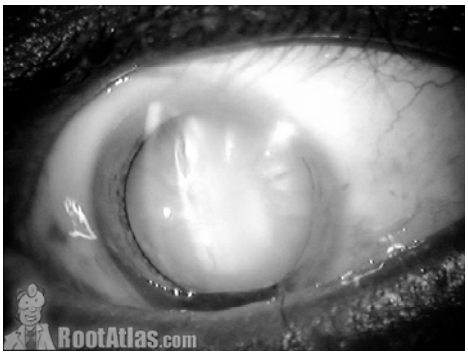
Treatment for Viral Keratitis

- 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



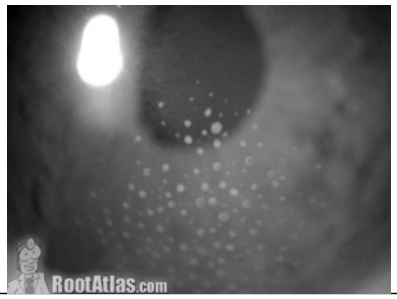
Topical Steroid Side Effects

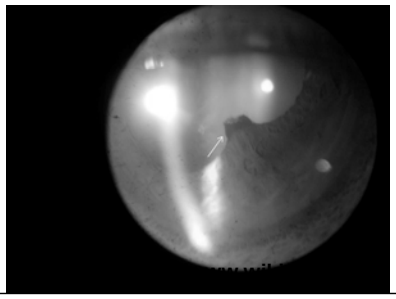
- Elevate IOP
  - Steroid-induced glaucoma
- Potentiate fungal corneal ulcer
- Cataracts
  - Long term use
- Can potentiate corneal perforation



Iritis

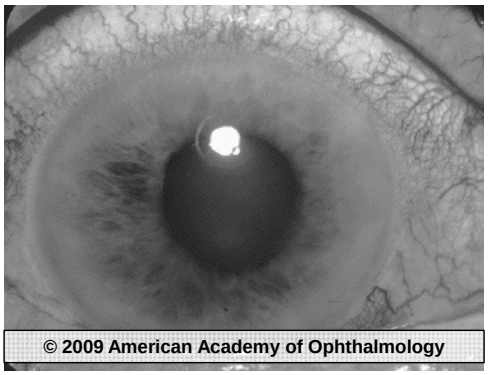
- Signs and Symptoms
  - Decreased vision
  - Pain and photophobia
  - Circumlimbal redness
  - Miotic pupil
- Rule Out
  - Trauma
  - Systemic inflammation
  - If Iritis is suspected – refer to Ophthalmology





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**

Summary

- **Red eyes are a common presentation to the primary care physician and treatment can be initiated for many of these disorders**
- **Avoid steroid drops and no Rx for topical anesthetic drops**
- **Handle recently traumatized eyes carefully**
- **Look for warning signs and symptoms of sight threatening conditions**
- **Know when to refer to ophthalmologist**