Ophthalmology Lecture 2: Red Eye for the Family Physician

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RED EYE FOR THE FAMILY PHYSICIAN

ELWA Family Medicine Residency Program

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BONO REGION, GHANA
INTRODUCTION

- For the primary care physician, the occurrence of a red eye is a frequent and prominent finding of a disease process in patients.
- A careful history and simple examination with the observation of typical clinical signs are important for the management of this common disorder.
- The causes can be classified as painful red eye, trauma, and other common conditions.
- The most frequent causes of a red eye, such as dry eye, conjunctivitis, keratitis, iritis, acute glaucoma, subconjunctival hematoma, foreign bodies, corneal abrasion, and blunt or penetrating trauma
• Often benign and self-limiting, some diseases associated with a red eye can nevertheless threaten eyesight or even life.
• Disorders that cause rapid blindness include infectious corneal ulcers, angle-closure glaucoma, traumatic or postoperative endophthalmitis, hyperacute gonococcal conjunctivitis, chemical injuries, and ocular trauma.
• The many clinical images accompanying the conditions discussed will enhance recognition of the important symptoms and signs of each disease, enabling the primary care physician to appropriately manage the patient with a red eye and refer urgent cases to an ophthalmologist.
CREDIT: MOST SLIDES FOR THIS PRESENTATION WERE TAKEN FROM THIS BOOK
DIFFERENTIATE RED EYE DISORDERS

- Needs immediate treatment
- Needs treatment within a few days
- Does not require treatment
SUBJECTIVE EYE COMPLAINTS

- Decreased vision
- Pain
- Redness

Characterize the complaint through history and exam.
TYPES OF RED EYE DISORDERS

- Mechanical trauma
- Chemical trauma
- Inflammation/infection
ETIOLOGIES OF RED EYE

- Chemical injury
- Angle-closure glaucoma
- Ocular foreign body
- Corneal abrasion
- Uveitis
- Conjunctivitis
- Ocular surface disease
- Subconjunctival hemorrhage
RED EYE: POSSIBLE CAUSES

- Trauma
- Chemicals
- Infection
- Allergy
- Systemic conditions
# RED EYE: CAUSE AND EFFECT

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Itching</td>
<td>Allergy</td>
</tr>
<tr>
<td>Burning</td>
<td>Lid disorders, dry eye</td>
</tr>
<tr>
<td>Foreign body sensation</td>
<td>Foreign body, corneal abrasion</td>
</tr>
<tr>
<td>Localized lid tenderness</td>
<td>Hordeolum, chalazion</td>
</tr>
</tbody>
</table>
# RED EYE: CAUSE AND EFFECT
(Continued)

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep, intense pain</td>
<td>Corneal abrasions, scleritis, iritis, acute glaucoma, sinusitis, etc.</td>
</tr>
<tr>
<td>Photophobia</td>
<td>Corneal abrasions, iritis, acute glaucoma</td>
</tr>
<tr>
<td>Halo vision</td>
<td>Corneal edema (acute glaucoma, uveitis)</td>
</tr>
</tbody>
</table>
Equipment needed to evaluate red eye
Refer red eye with vision loss to ophthalmologist for evaluation
RED EYE DISORDERS:
AN ANATOMIC APPROACH

- Face
- Adnexa
  - Orbital area
  - Lids
  - Ocular movements
- Globe
  - Conjunctiva, sclera
  - Anterior chamber (using slit lamp if possible)
  - Intraocular pressure
Disorders of the Ocular Adnexa

- Skin
- Orbicularis oculi muscle
- Hair follicle
- Perifollicular glands
- Eyelash

**UPPER EYELID: ANTERIOR ANATOMY**
Disorders of the Ocular Adnexa

Hordeolum
Disorders of the Ocular Adnexa

UPPER EYELID: POSTERIOR ANATOMY

- Conjunctiva
- Meibomian glands (tarsal plate)
- Mucocutaneous junction
- Meibomian gland orifice
HORDEOLUM/CHALAZION: TREATMENT

- Goal
  - To promote drainage

- Treatment
  - Acute/subacute: Warm-hot compresses, tid
  - Chronic: Refer to ophthalmologist
BLEPHARITIS

- Inflammation of lid margin
- Associated with dry eyes
- Seborrhea causes dried skin and wax on base of lashes
- May have Staphylococcal infection
- Symptoms: lid burning, lash mattering
Collarettes on eyelashes of patient with blepharitis
BLEPHARITIS: TREATMENT

- Lid and face hygiene
  - Warm compresses to loosen deposits on lid margin
  - Gentle scrubbing with nonirritating shampoo or scrub pads
- Artificial tears to alleviate dry eye
- Antibiotic or antibiotic-corticosteroid ointment
- Oral doxycycline 100 mg daily for refractory cases
Disorders of the Ocular Adnexa

Preseptal cellulitis
Orbital cellulitis
ORBITAL CELLULITIS:
SIGN AND SYMPTOMS

- External signs: redness, swelling
- Motility impaired, painful
- ± Proptosis
- Often fever and leukocytosis
- ± Optic nerve: decreased vision, afferent pupillary defect, disc edema
ORBITAL CELLULITIS: MANAGEMENT

- Hospitalization
- Ophthalmology consult
- Eye consult
- Blood culture
- Orbital CT scan
- ENT consult if pre-existing sinus disease
ORBITAL CELLULITIS: TREATMENT

- IV antibiotics stat: *Staphylococcus, Streptococcus, H. influenzae*
- Surgical debridement if fungus, no improvement, or subperiosteal abscess
- Complications: cavernous sinus thrombosis, meningitis
Lacrimal System Disorders

The lacrimal apparatus:
- Lacrimal gland
- Upper punctum
- Upper canaliculus
- Lacrimal sac
- Lower punctum
- Lower canaliculus
- Nasolacrimal duct
Lacrimal System Disorders

Dacryocystitis
NASOLACRIMAL DUCT OBSTRUCTION: CONGENITAL

- Massage tear sac daily
- Probing, irrigation, if chronic
- Systemic antibiotics if infected
NASOLACRIMAL DUCT OBSTRUCTION: ACQUIRED

- Trauma a common cause
- Systemic antibiotics if infected
- Surgical procedure after one episode of dacyrocystitis (dacryocystorhinostomy) prn
Dilated conjunctival blood vessels
ADULT CONJUNCTIVITIS:
MAJOR CAUSES

- Bacterial
- Viral
- Allergic
# CONJUNCTIVITIS: DISCHARGE

<table>
<thead>
<tr>
<th>Discharge</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purulent</td>
<td>Bacterial</td>
</tr>
<tr>
<td>Clear</td>
<td>Viral*</td>
</tr>
<tr>
<td>Watery, with stringy; white mucus</td>
<td>Allergic**</td>
</tr>
</tbody>
</table>

* Preauricular lymphadenopathy signals viral infection
** Itching often accompanies
BACTERIAL CONJUNCTIVITIS: COMMON CAUSES

- *Staphylococcus* (skin)
- *Streptococcus* (respiratory)
- *Haemophilus* (respiratory)
BACTERIAL CONJUNCTIVITIS TREATMENT

- Topical antibiotic: qid x 7 days (aminoglycoside, erythromycin, fluoroquinolone, sulfacetamide, or trimethoprim-polymyxin)
- Warm compresses
- Refer if not markedly improved in 3 days
Copious purulent discharge: Suspect *Neisseria gonorrhoeae*.
Viral conjunctivitis
VIRAL CONJUNCTIVITIS

- Watery discharge
- Highly contagious
- Palpable preauricular lymph node
- History of URI, sore throat, fever common

If pain, photophobia, or decreased vision, refer.
Allergic conjunctivitis
ALLERGIC CONJUNCTIVITIS

- Associated conditions: hay fever, asthma, eczema
- Contact allergy: chemicals, cosmetics, pollen
- Treatment: topical antihistamine/decongestant drops
- Systemic antihistamines if necessary for systemic disease

Refer refractory cases.
NEONATAL CONJUNCTIVITIS: CAUSES

- Bacteria (N. gonorrhoeae, 2–4 days)
- Bacteria (Staphylococcus, Streptococcus, 3–5 days)
- Chlamydia (5–12 days)
- Viruses (eg, herpes, from mother)
Subconjunctival hemorrhage
TEARS AND DRY EYES

- Tear functions:
  - Lubrication
  - Bacteriostatic and immunologic functions
- Dry eye (keratoconjunctivitis sicca) is a tear deficiency state
TEAR DEFICIENCY STATES:
SYMPTOMS

- Burning
- Foreign-body sensation
- Paradoxical reflex tearing
- Symptoms can be made worse by reading, computer use, television, driving, lengthy air travel
TEAR DEFICIENCY STATES: ASSOCIATED CONDITIONS

- Aging
- Rheumatoid arthritis
- Stevens-Johnson syndrome
- Chemical injuries
- Ocular pemphigoid
- Systemic medications
DRY EYES: TREATMENT

- Artificial tears, cyclosporine drops
- Nonpreserved artificial tears
- Lubricating ointment at bedtime
- Punctal occlusion
- Counseling about activities that make dry eyes worse
Thyroid exophthalmos: one cause of exposure keratitis
EXPOSURE KERATITIS: CAUSES AND MANAGEMENT

- Due to incomplete lid closure
- Manage with lubricating solutions/ointments
- Tape lids shut at night
- Do not patch
- Refer severe cases
Pinguecula
Ocular Surface Disorders

Pterygium
INFLAMED PINGUECULA AND PTERYGIUM: MANAGEMENT

- Artificial tears
- Counsel patients to avoid irritation
- If documented growth or vision loss, refer
Anterior Segment Disorders

Anterior chamber

Lens

Cornea

Iris

Ciliary body

Bulbar conjunctiva

ANTERIOR SEGMENT
ACUTE CORNEAL DISORDERS: SYMPTOMS

- Eye pain
  - Foreign-body sensation
  - Deep and boring
- Photophobia
- Blurred vision
Irregular corneal light reflex and central corneal opacity
Fluorescein dye strip applied to the conjunctiva
Corneal abrasion, stained with fluorescein and viewed with cobalt blue light
CORNEAL ABRASION

- Signs and symptoms: redness, tearing, pain, photophobia, foreign-body sensation, blurred vision, small pupil
- Causes: injury, welder’s arc, contact lens overwear
CORNEAL ABRASION: MANAGEMENT

Goals:
- Promote rapid healing
- Relieve pain
- Prevent infections

Treatment:
- 1% cyclopentolate
- Topical antibiotics
  - Drops (e.g., fluoroquinolone, others) or ointment (e.g., erythromycin, bacitracin/polymyxin)
- ± Pressure patch x 24–48 hours
- ± Oral analgesics
Applying a pressure patch
CHEMICAL INJURY

- A true ocular emergency
- Requires immediate irrigation with nearest source of water
- Management depends on offending agent
Chemical burn: acid
Chemical burn: alkali
INFECTIONOUS KERATITIS

- Frequently result from mechanical trauma
- Can cause permanent scarring and decreased vision
- Early detection, aggressive therapy are vital
Bacterial infection of the cornea
Primary herpes simplex infection
Corneal herpes simplex dendrites, stained with fluorescein
Anterior Segment Disorders

Rx
Topical Anesthetics
TOPICAL STEROIDS: SIDE EFFECTS

- Facilitate corneal penetration of herpes virus
- Elevate IOP (steroid-induced glaucoma)
- Cataract formation and progression
- Potentiate fungal corneal ulcers
Hyphema
INFLAMMATORY CONDITIONS CAUSING A RED EYE:

- Episcleritis
- Scleritis
- Anterior uveitis (iritis)
Anterior Segment Disorders

Episcleritis

Scleritis
Anterior Segment Disorders

IRITIS

Signs and Symptoms
- Circumlimbal redness
- Pain
- Photophobia
- Decreased vision
- Miotic pupil

Rule Out
- Systemic inflammation
- Trauma
- Autoimmune disease
- Systemic infection

Recognize and refer.
ACUTE GLAUCOMA: SIGNS AND SYMPTOMS

- Red eye
- Severe pain in, around eye
- Frontal headache
- Blurred vision, halos seen around lights
- Nausea, vomiting
- Pupil fixed, mid-dilated, slightly larger than contralateral side
- Elevated IOP
- Corneal haze
Acute angle-closure glaucoma
ACUTE GLAUCOMA: INITIAL TREATMENT

- Pilocarpine 2% drops q 15 min x 2
- Timolol maleate 0.5%, 1 drop
- Apraclonidine 0.5%, 1 drop
- Acetazolamide 500 mg po or IV
- IV mannitol 20% 300–500 cc
COMMON RED EYE DISORDERS: TREATMENT INDICATED

- Hordeolum
- Chalazion
- Blepharitis
- Conjunctivitis
- Subconjunctival hemorrhage
- Dry eyes
- Corneal abrasions (most)
VISION-THREATENING RED EYE SIGNS & SYMPTOMS: REFERRAL INDICATED

- Decreased vision
- Ocular pain
- Photophobia
- Circumlimbal redness
- Corneal edema
- Corneal ulcers/ dendrites
- Abnormal pupil
- Elevated IOP
VISION-THREATENING RED EYE DISORDERS: URGENT REFERRAL

- Orbital cellulitis
- Scleritis
- Chemical injury
- Corneal infection
- Hyphema
- Iritis
- Acute glaucoma
<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
<th>Treat</th>
<th>Refer</th>
<th>Oral medicine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conjunctivitis</td>
<td>Discharge in both eyes with clear cornea and normal pupil</td>
<td>Antibiotic ointment x 3/day for 5 days. Advise on hygiene</td>
<td>Refer</td>
<td></td>
</tr>
<tr>
<td>Corneal ulcer</td>
<td>White spot or mark on the cornea which stains with fluorescein</td>
<td>Hourly antibiotic drops or ointment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute iritis</td>
<td>Small pupil which becomes irregular as it dilates</td>
<td>Dilate the pupil if possible</td>
<td></td>
<td>Oral diamox 500 mg and pilocarpine drops if possible</td>
</tr>
<tr>
<td>Acute glaucoma</td>
<td>Very painful eye with poor vision and dilated pupil</td>
<td></td>
<td>Refer</td>
<td></td>
</tr>
</tbody>
</table>
MANAGING THE RED EYE: PCP AND OPHTHALMOLOGIST

- Clinical expertise
- Cooperation
- Communication
Resources


Basic and Clinical Science Course, Section 8: *External Disease and Cornea*. San Francisco: American Academy of Ophthalmology; (updated annually).


Red Eye Picture Quiz

What is wrong with these eyes? What is the management?

1. A 14-year-old boy. Complains of itching eyes for three years with sticky clear discharge. VA 6/6.

2. 45-year-old female. Complains of painful eye and discomfort in bright light with watery discharge. VA 6/12.
**ANSWERS**

1. A 14-year-old boy. Complains of itching eyes for three years with sticky, clear discharge. VA 6/6.

2. 45-year-old female. Complains of painful eye and discomfort in bright light with watery discharge. VA 6/12.

**Vernal keratoconjunctivitis (Vernal catarrh)**

The lumpy appearance of the conjunctiva is caused by swelling of the conjunctiva due to the chronic inflammation. In most cases, allergic conjunctivitis will improve in adulthood and does not require intensive treatment. Topical steroids should only be used during acute attacks if there is evidence of corneal damage.

**Acute anterior uveitis**

Photophobia is typical in these patients as the pupil's constriction in the response to light causes pain. The redness is maximum near the limbus (ciliary injection) and the pupil is irregular where it is stuck to the front of the lens. Acute anterior uveitis should be managed with atropine to keep the pupil dilated. Topical steroids may be useful in severe cases.
Five-year-old girl. Severe pain and loss of vision for three days. Used traditional eye medicines one week ago. VA CF.

Six-year-old male. Painful eye for ten days. Had malaria one month ago. Corneal sensation reduced when tested. VA 6/60.
3. Suppurative keratitis
The eye is very red and the iris cannot be seen clearly which suggests the cornea is cloudy. This eye requires hourly topical antibiotics. If facilities are available then a cornea scraping and gram stain should be performed before starting topical treatment. In some regions fungi are a common cause of corneal ulcer and anti-fungal treatment will be required. The white line inferiorly is a hypopyon caused by pus formation in the anterior chamber. It indicates severe inflammation. Traditional eye medicines are not sterile and may cause severe infections.

4. Herpes simplex keratitis
Not all cases of herpetic simplex keratitis present with a typical dendritic/geographic ulcer. A useful sign of herpes is reduced sensitivity of the cornea. This is thought to be due to damage to the sensory nerves. Herpes keratitis is sometimes associated with febrile illness. Herpes keratitis is managed with a topical antiviral such as acyclovir or trifluorothymidine.
25-year-old woman. No pain or discharge. Complained of red eye since this morning. VA 6/6.

19-year-old male. Complains of gritty foreign body sensation, painful eye for three days with sticky yellowish discharge. VA 6/9.
ANSWERS

5  25-year-old woman. No pain or discharge complained of red eye since this morning. VA 6/6.

Sub-conjunctival haemorrhage
The lack of pain and discharge imply that there is no inflammation. The very sharply defined edge is typical of a sub-conjunctival haemorrhage. No treatment is required and redness will clear over a course of 2 weeks.

6  19-year-old male. Complains of gritty foreign body sensation, painful eye for three days with sticky yellowish discharge, VA 6/9.

Bacterial conjunctivitis
The entire conjunctiva is red and eye is discharging pus on the lower lid and on the eyelashes. This should be treated with intensive topical antibiotics for one week. In very severe cases, particularly in young men, you should consider doing a gram stain to look for Gonococcus, and you should ask specifically about symptoms of urethritis.