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## 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**

Eye Care Skills: Presentations for Physicians  
and Other Health Care Professionals Version 3.0

# **Managing the Red Eye**

**Speaker Notes**

Karla J. Johns, MD  
Executive Editor

 AMERICAN ACADEMY  
OF OPHTHALMOLOGY  
The Eye M.D. Association

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# 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

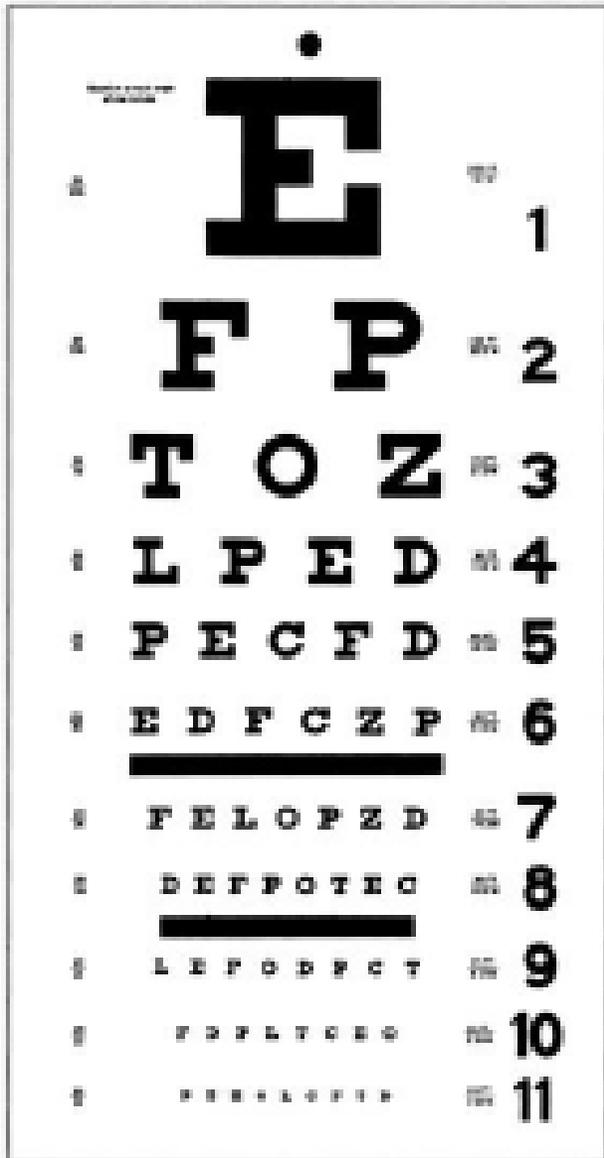
Symptom	Cause
Itching	Allergy
Burning	Lid disorders, dry eye
Foreign body sensation	Foreign body, corneal abrasion
Localized lid tenderness	Hordeolum, chalazion

## RED EYE: CAUSE AND EFFECT (Continued)

Symptom	Cause
Deep, intense pain	Corneal abrasions, scleritis, iritis, acute glaucoma, sinusitis, etc.
Photophobia	Corneal abrasions, iritis, acute glaucoma
Halo vision	Corneal edema (acute glaucoma, uveitis)



Equipment needed to evaluate red eye

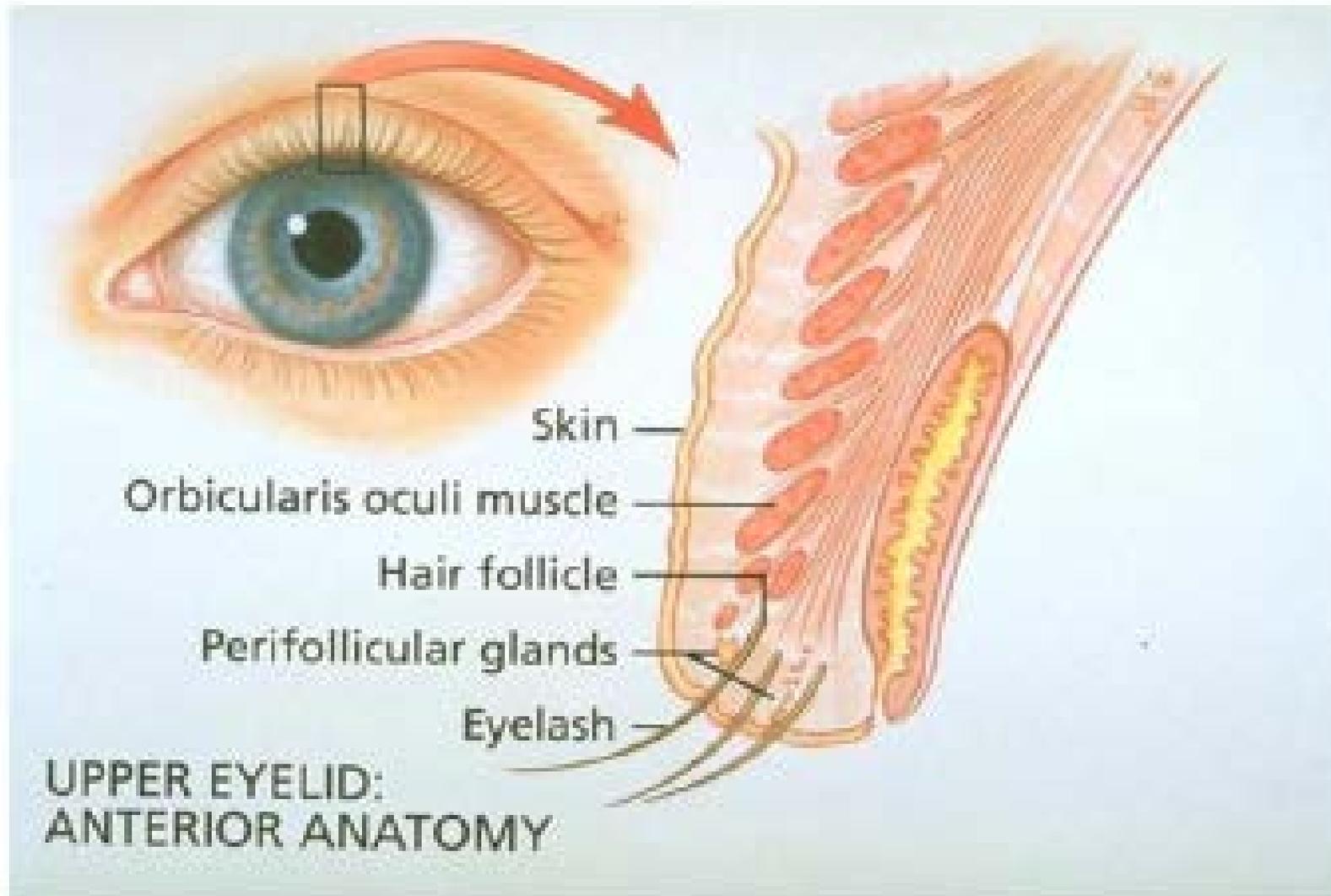


Refer red eye with vision loss to ophthalmologist for evaluation

# 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

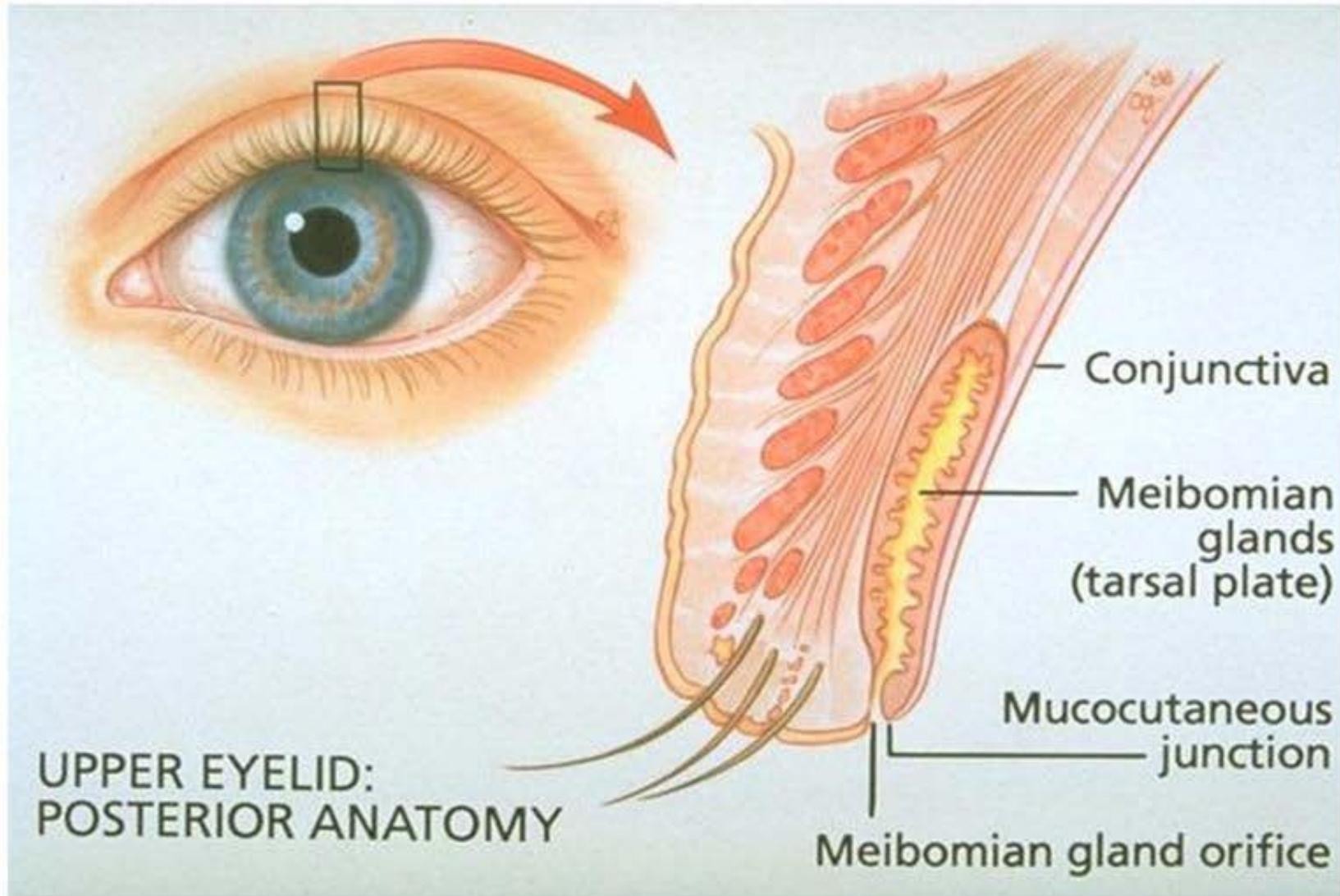


## Disorders of the Ocular Adnexa



**Hordeolum**

## Disorders of the Ocular Adnexa





**Chalazion**

# **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



**Preseptal cellulitis**



**Orbital cellulitis**

# ORBITAL CELLULITIS: SIGNS AND SYMPTOMS

- External signs: redness, swelling
- Motility impaired, painful
- $\pm$  Proptosis
- Often fever and leukocytosis
- $\pm$  Optic nerve: decreased vision, afferent pupillary defect, disc edema



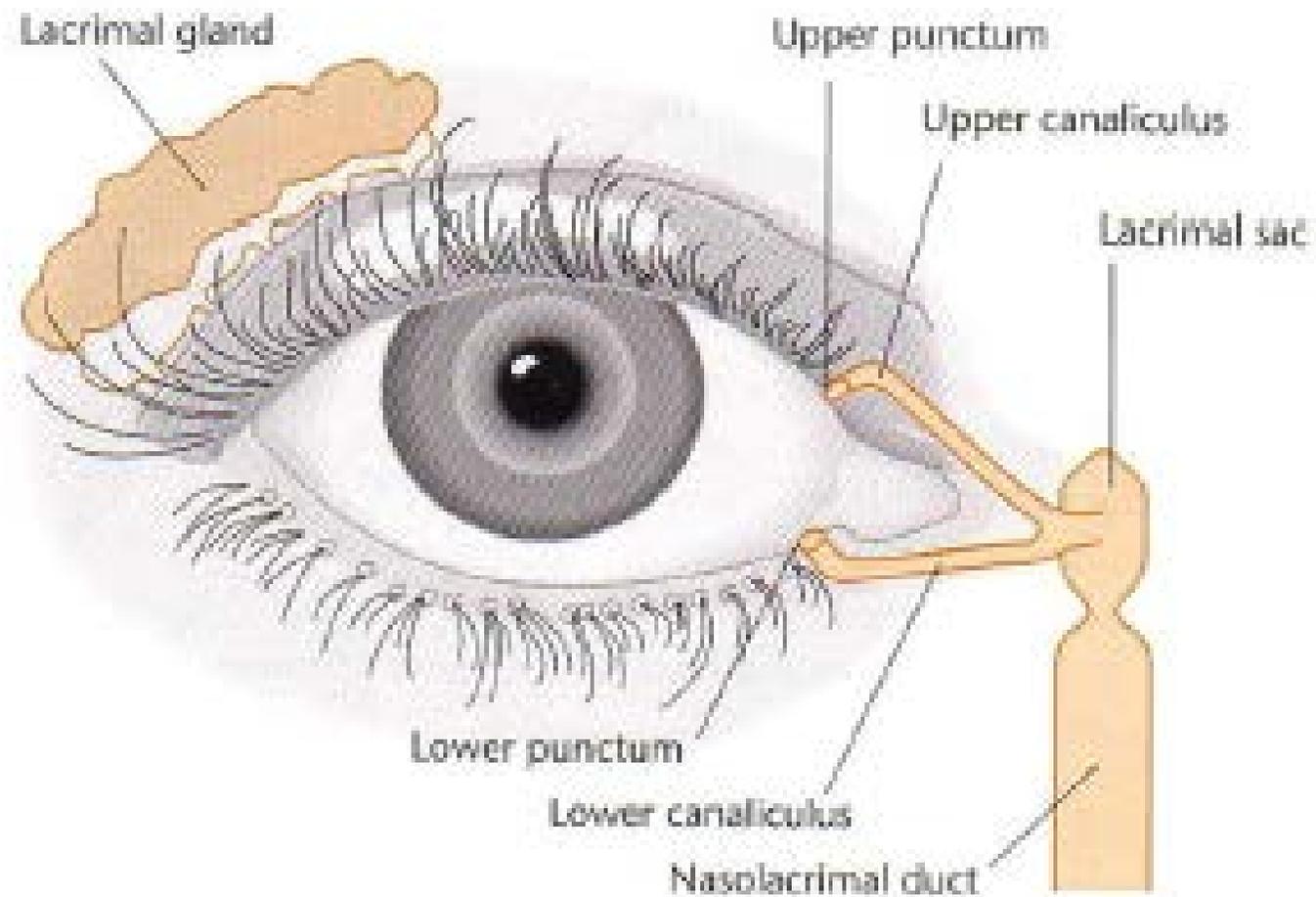
# **ORBITAL CELLULITIS: MANAGEMENT**

- 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

The lacrimal apparatus.



**Lacrimal system**



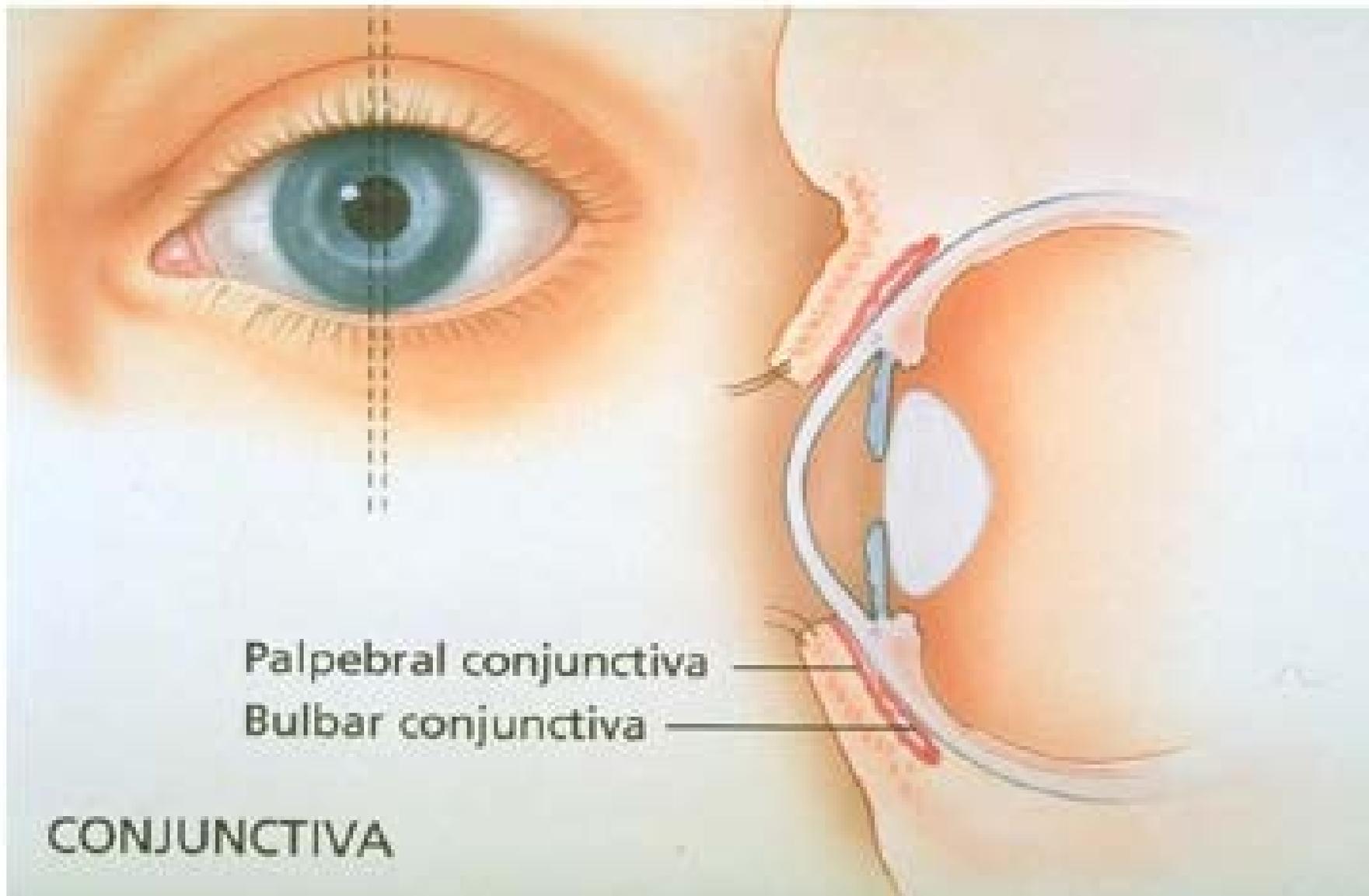
Dacryocystitis

# **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 dacryocystitis (dacryocystorhinostomy) prn





**Dilated conjunctival blood vessels**

# **ADULT CONJUNCTIVITIS: MAJOR CAUSES**

- Bacterial
- Viral
- Allergic

# CONJUNCTIVITIS: DISCHARGE

Discharge	Cause
Purulent	Bacterial
Clear	Viral*
Watery, with stringy; white mucus	Allergic**

\* 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

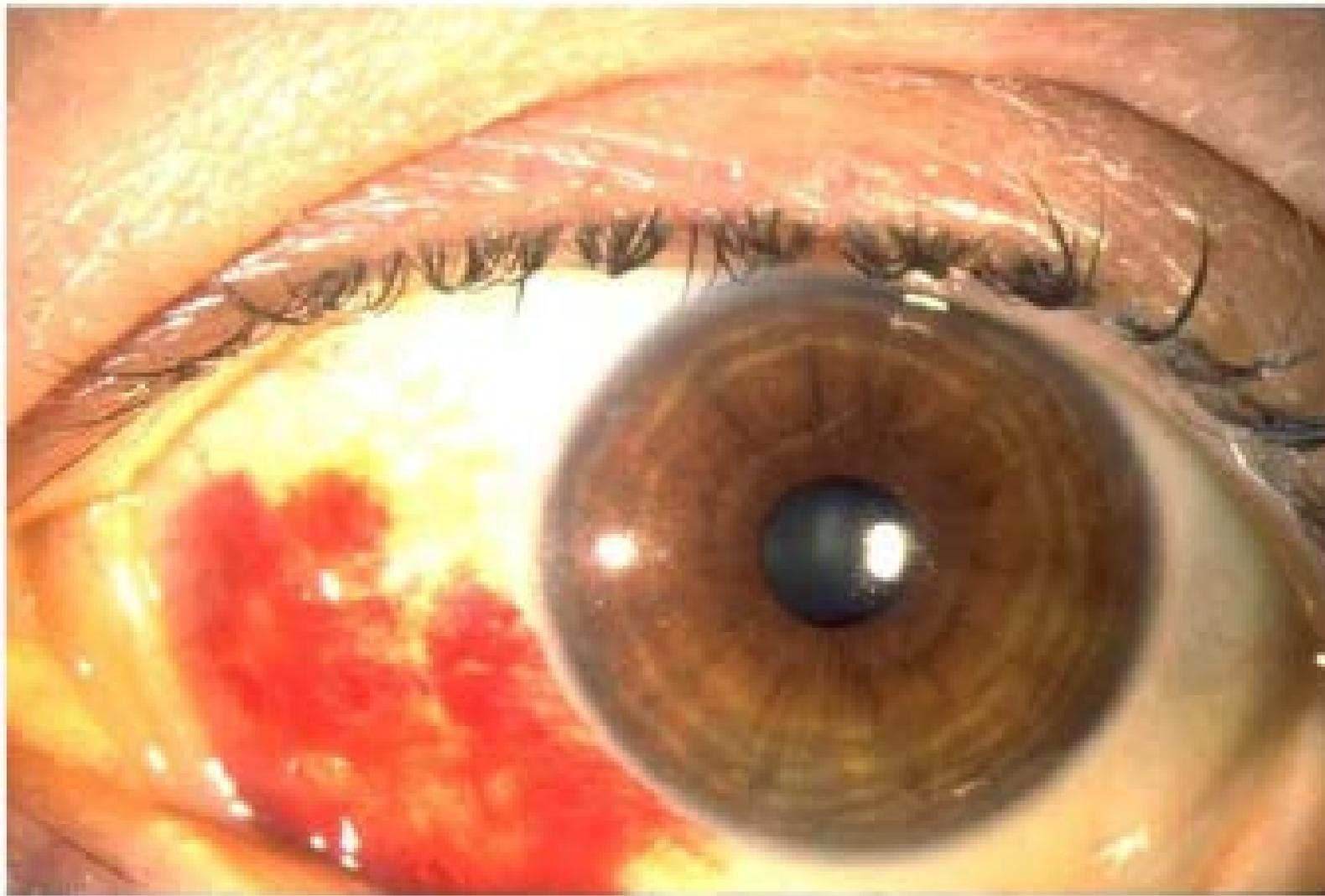
# ALLERGIC CONJUNCTIVITIS

- 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

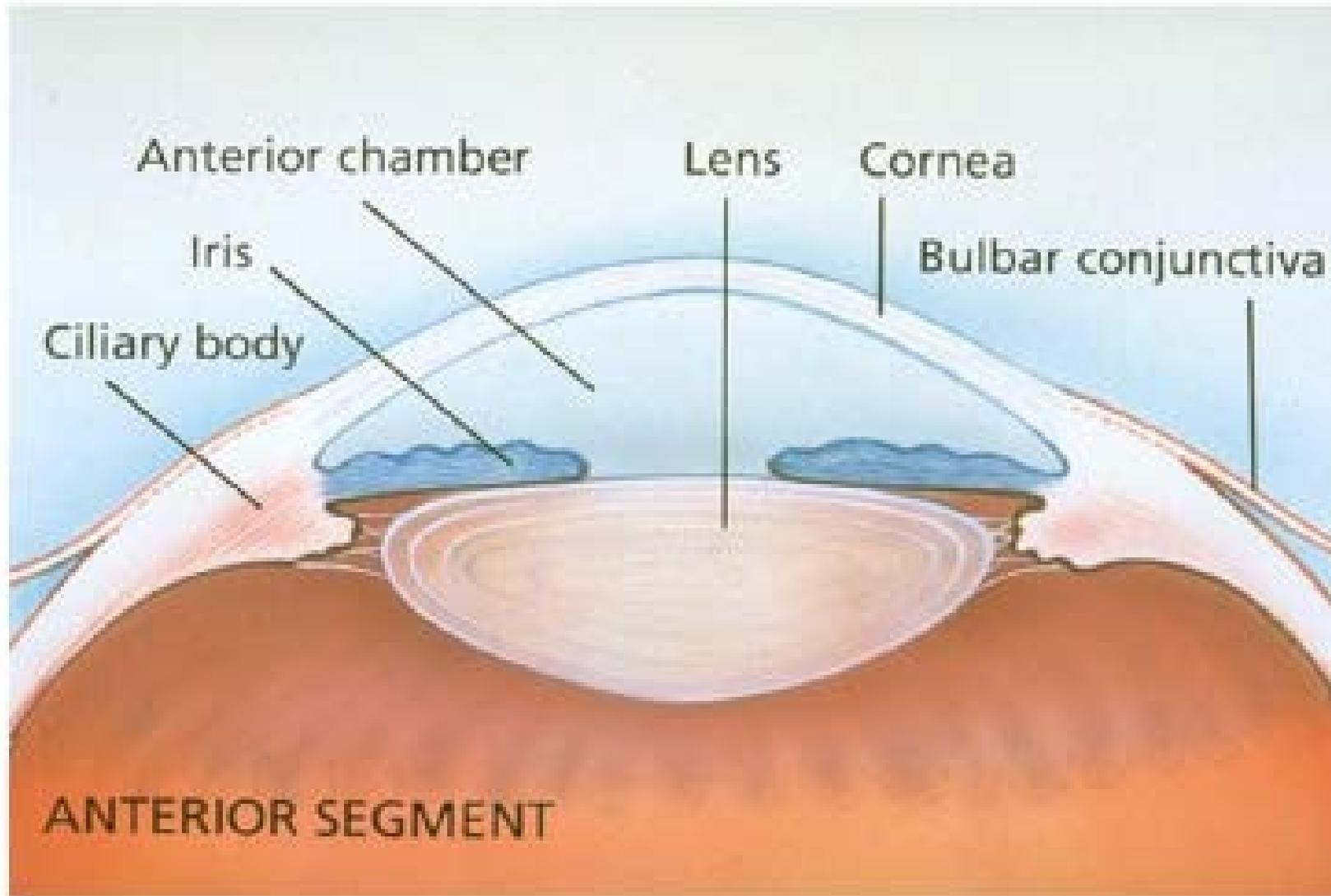


Pterygium

# **INFLAMED PINGUECULA AND PTERYGIUM: MANAGEMENT**

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

## Anterior Segment Disorders



# ACUTE CORNEAL DISORDERS: SYMPTOMS

- Eye pain
  - Foreign-body sensation
  - Deep and boring
- Photophobia
- Blurred vision

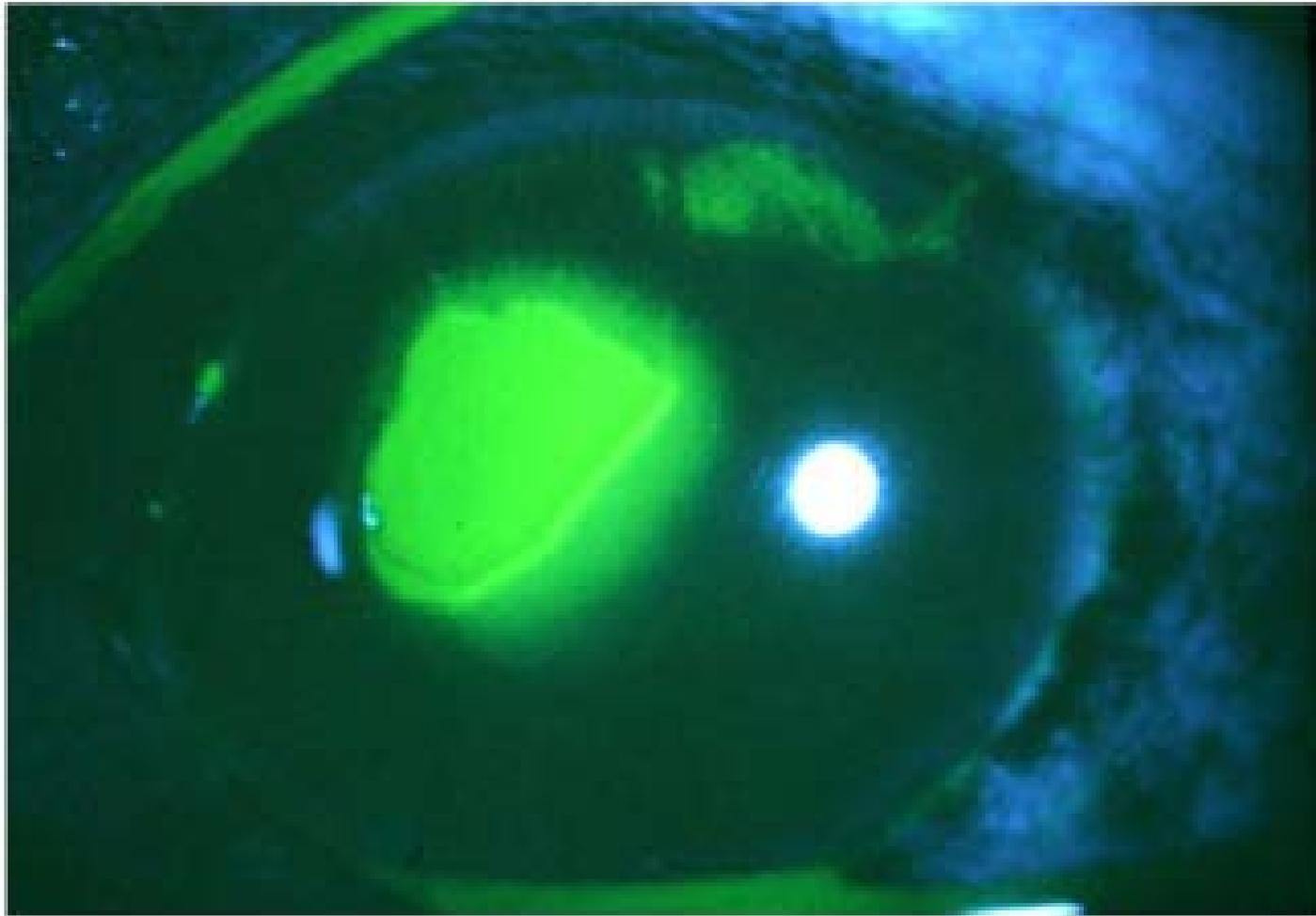


**Irregular corneal light reflex and central corneal opacity**

## Anterior Segment Disorders



**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 (eg, fluoroquinolone, others) or ointment (eg, erythromycin, bacitracin/polymyxin)
- ± Pressure patch x 24–48 hours
- ± Oral analgesics

## Anterior Segment Disorders



Applying a pressure patch

# CHEMICAL INJURY

- A true ocular emergency
- Requires immediate irrigation with nearest source of water
- Management depends on offending agent

## Anterior Segment Disorders



**Chemical burn: acid**



**Chemical burn: alkali**

# INFECTIOUS KERATITIS

- Frequently result from mechanical trauma
- Can cause permanent scarring and decreased vision
- Early detection, aggressive therapy are vital



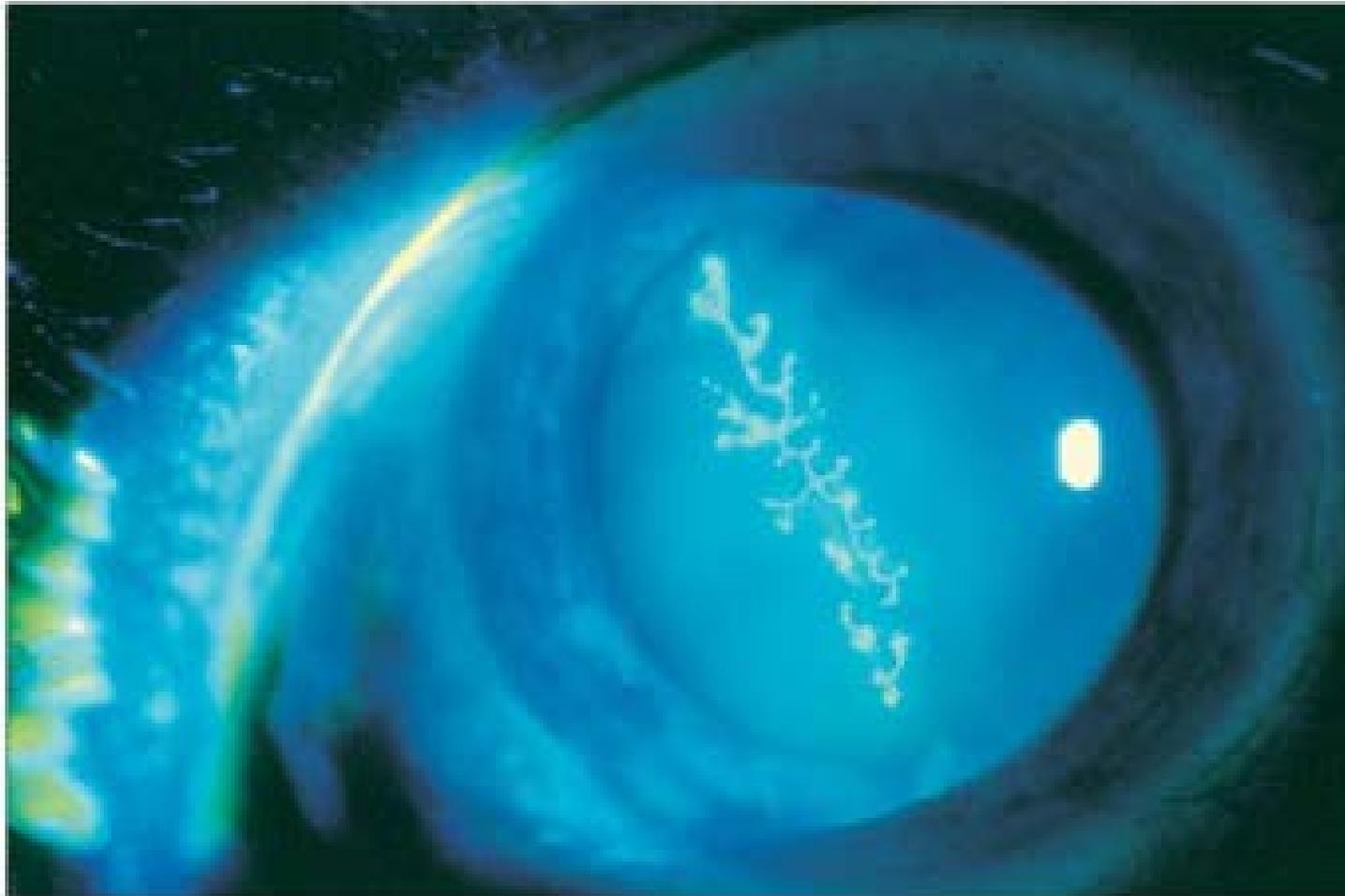
**Bacterial infection of the cornea**

## Anterior Segment Disorders

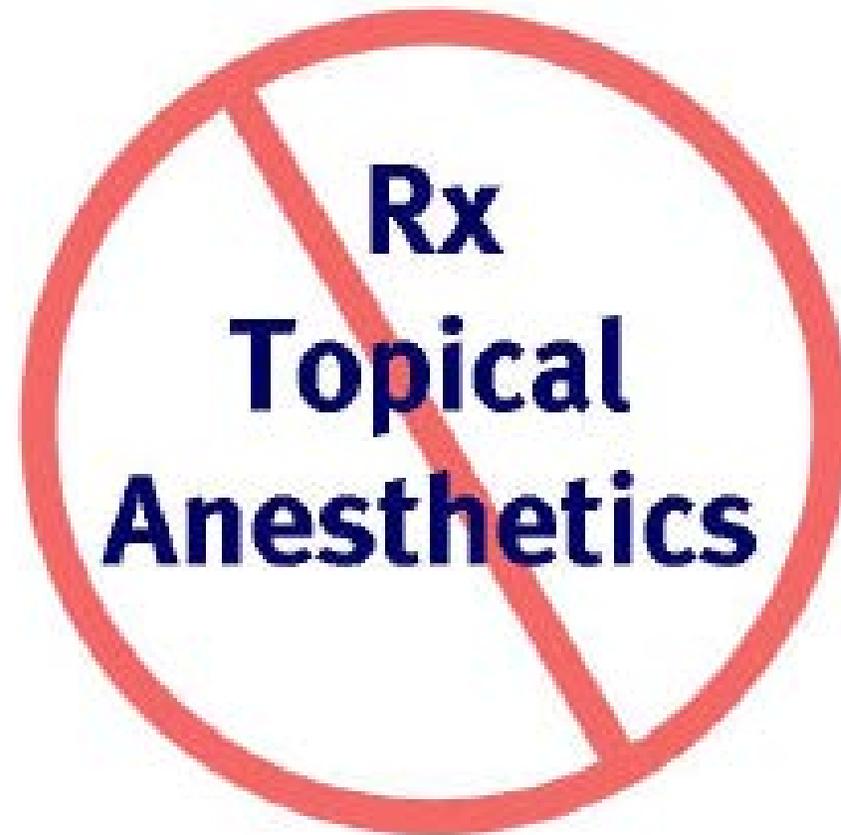


**Primary herpes simplex infection**

## Anterior Segment Disorders

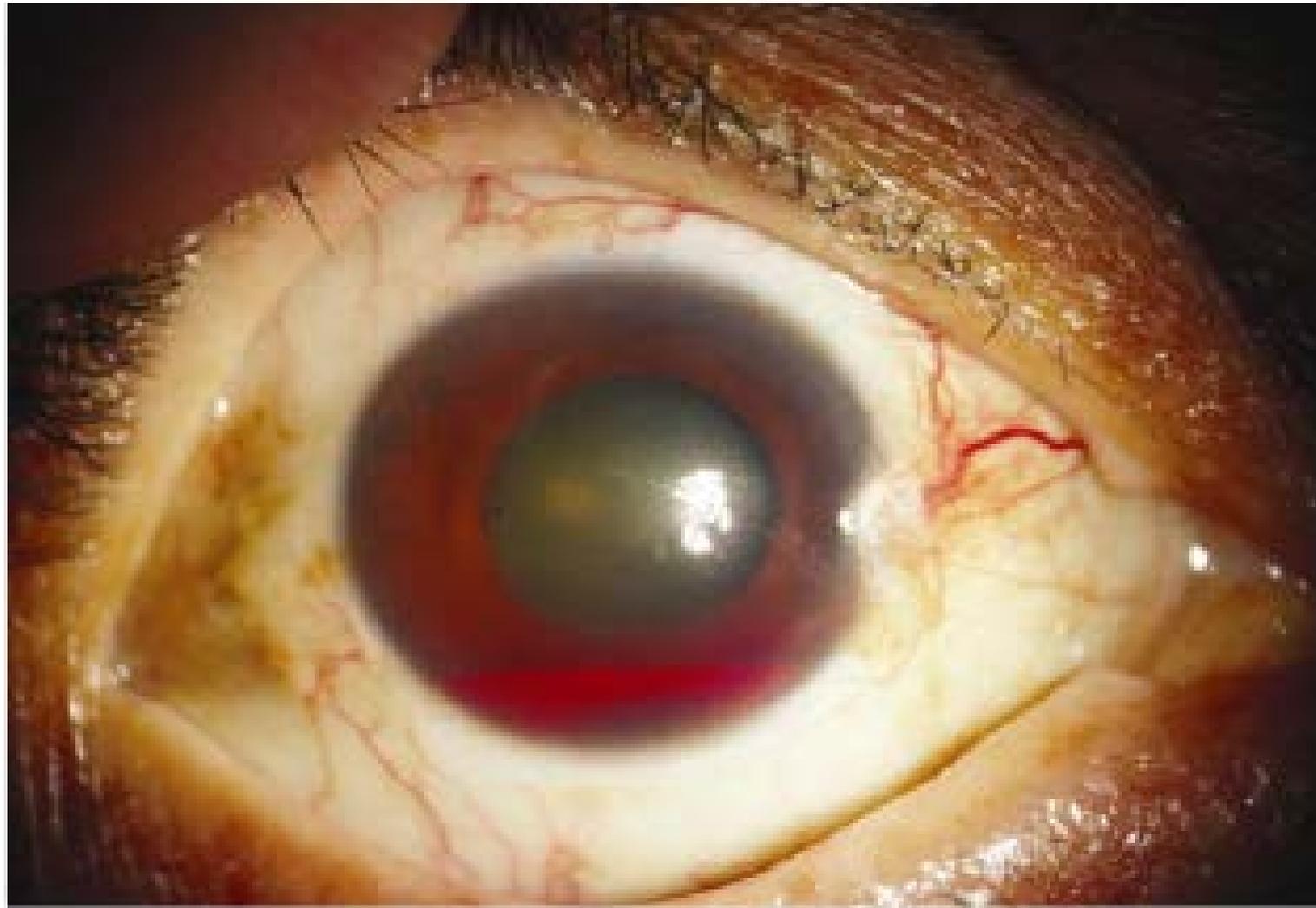


Corneal herpes simplex dendrites, stained with fluorescein



# TOPICAL STEROIDS: SIDE EFFECTS

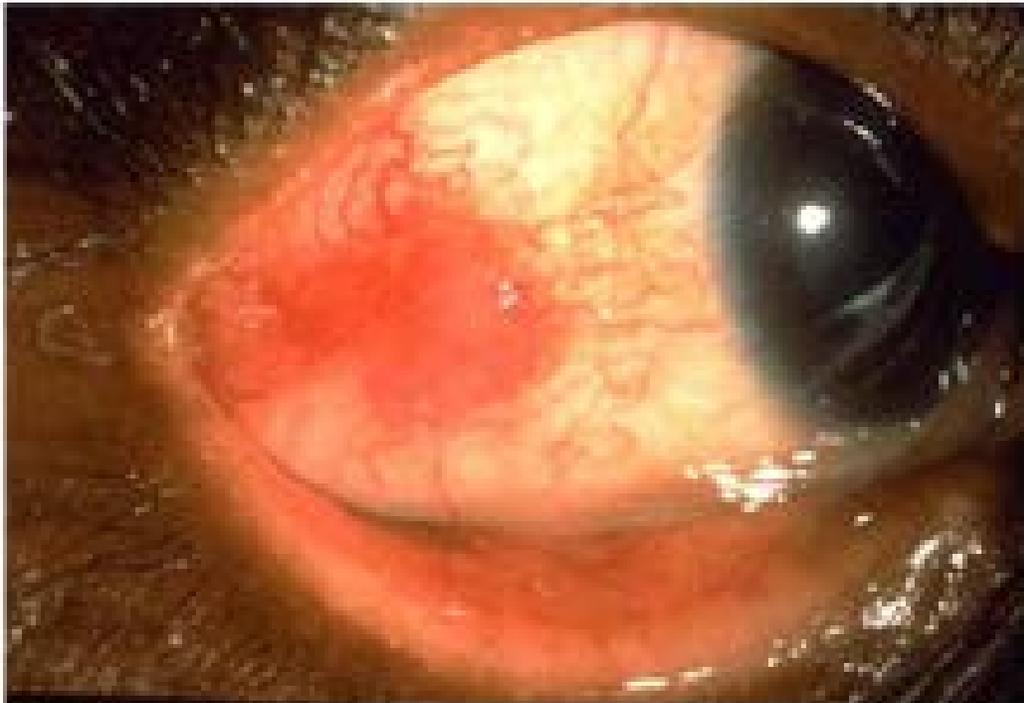
- Facilitate corneal penetration of herpes virus
- Elevate IOP (steroid-induced glaucoma)
- Cataract formation and progression
- Potentiate fungal corneal ulcers



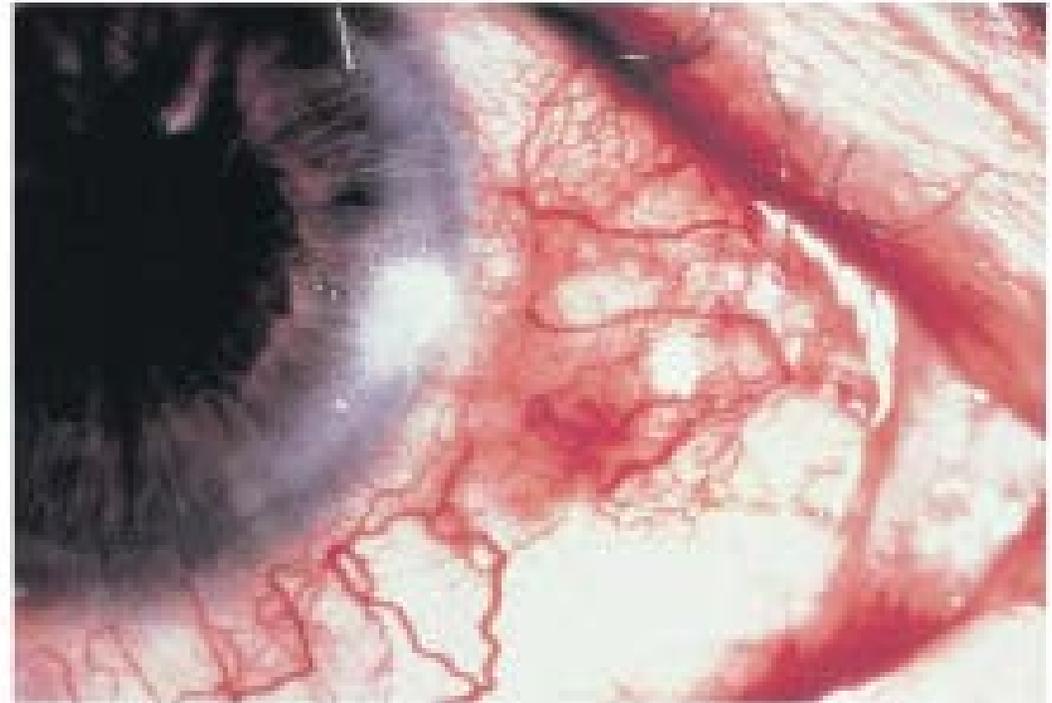
Hyphema

# **INFLAMMATORY CONDITIONS CAUSING A RED EYE:**

- Episcleritis
- Scleritis
- Anterior uveitis (iritis)



**Episcleritis**



**Scleritis**

# IRITIS

### Signs and Symptoms

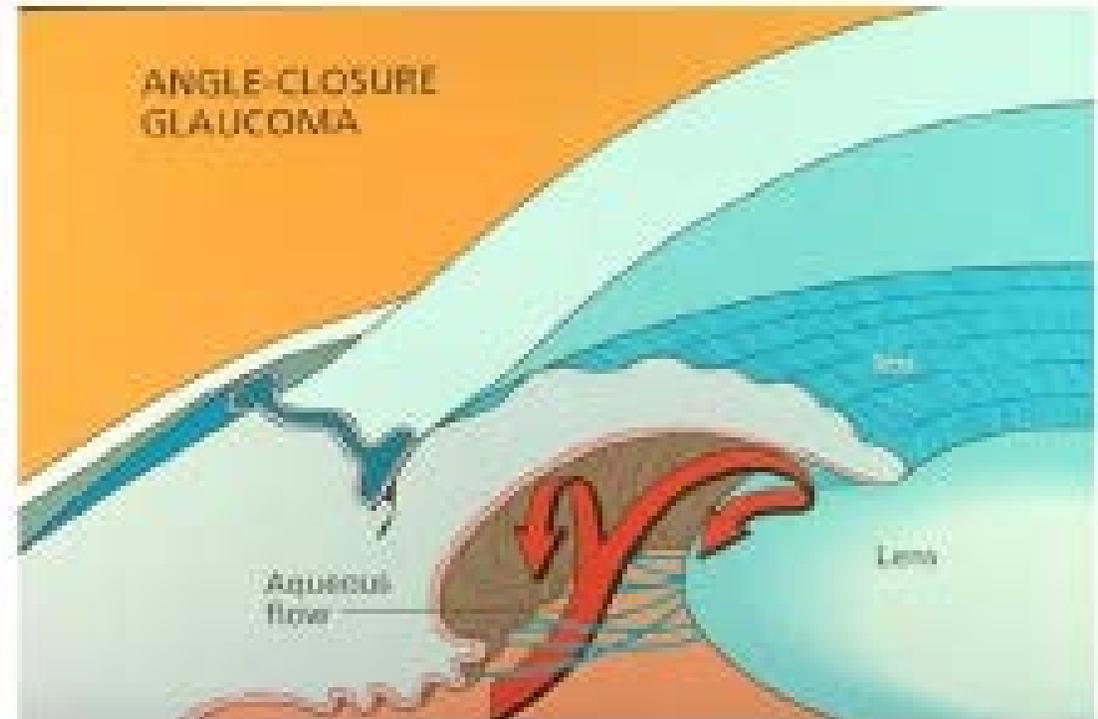
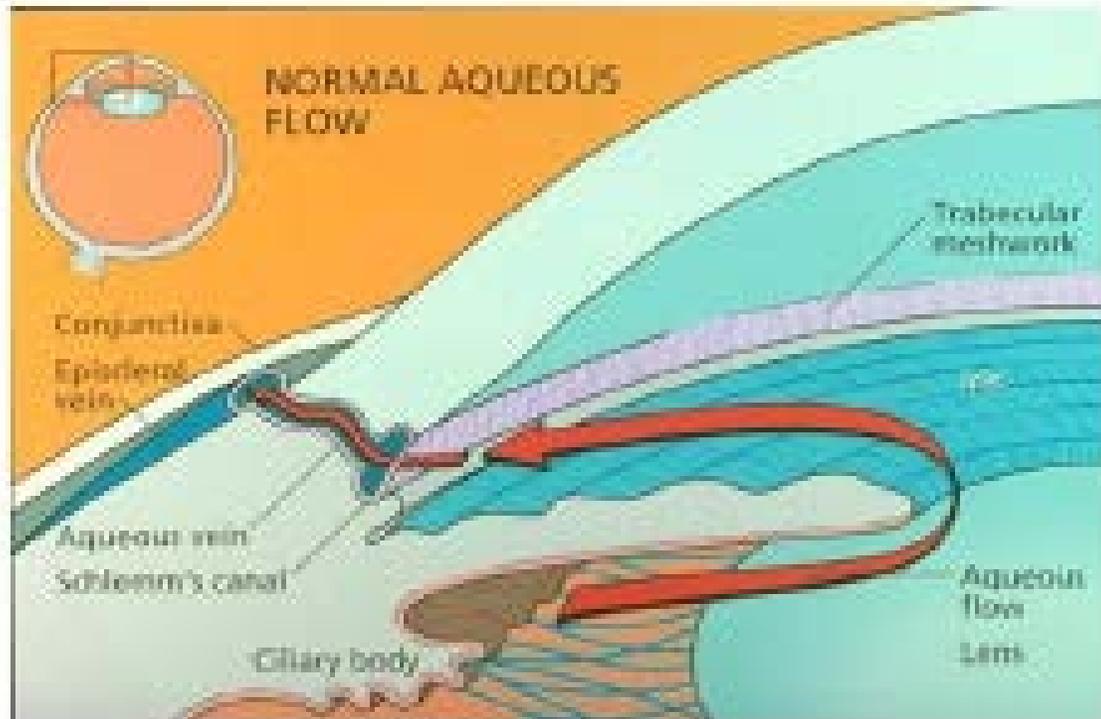
- Circumlimbal redness
- Pain
- Photophobia
- Decreased vision
- Miotic pupil

### Rule Out

- Systemic inflammation
- Trauma
- Autoimmune disease
- Systemic infection

**Recognize and refer.**

# Anterior Segment Disorders



# 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

# First aid management of a red eye with no injury

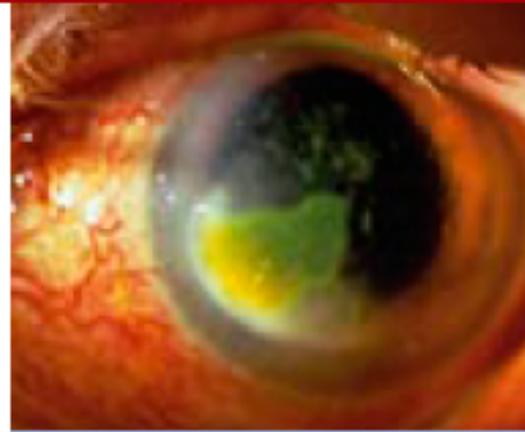


## Conjunctivitis

Discharge in both eyes with clear cornea and normal pupil

### Treat

Antibiotic ointment x 3/day for 5 days.  
Advise on hygiene



## Corneal ulcer

White spot or mark on the cornea which stains with fluorescein

### Refer

Hourly antibiotic drops or ointment



## Acute iritis

Small pupil which becomes irregular as it dilates

### Refer

Dilate the pupil if possible



## Acute glaucoma

Very painful eye with poor vision and dilated pupil

### Refer

Oral diamox 500 mg and pilocarpine drops if possible

# MANAGING THE RED EYE: PCP AND OPHTHALMOLOGIST

- Clinical expertise
- Cooperation
- Communication



# Resources

Basic and Clinical Science Course, Section 7: *Orbit, Eyelids, and Lacrimal System*. San Francisco: American Academy of Ophthalmology; (updated annually).

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

Basic and Clinical Science Course, Section 9: *Intraocular Inflammation and Uveitis*. San Francisco: American Academy of Ophthalmology; (updated annually).

Bradford, Cynthia A, ed: *Basic Ophthalmology for Medical Students and Primary Care Residents*. 8th ed. San Francisco: American Academy of Ophthalmology; 2004.

*Blepharitis* (Preferred Practice Pattern). San Francisco: American Academy of Ophthalmology; 2003.

*Bacterial Keratitis* (Preferred Practice Pattern). San Francisco: American Academy of Ophthalmology; 2000.

*Conjunctivitis* (Preferred Practice Pattern). San Francisco: American Academy of Ophthalmology; 2003.

*Dry Eye Syndrome* (Preferred Practice Pattern). San Francisco: American Academy of Ophthalmology; 2003.

Trobe, Jonathan D: *The Physician's Guide to Eye Care*. 3rd ed. San Francisco: American Academy of Ophthalmology; 2006.

# Red Eye Picture Quiz

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



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



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

# ANSWERS



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

## **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.



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

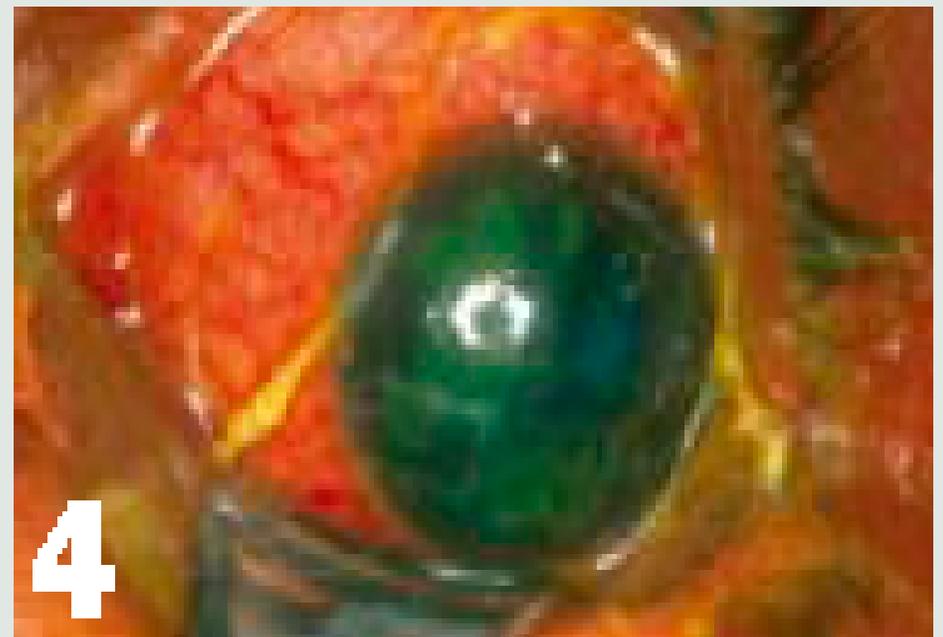
## **Acute anterior uveitis**

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.



3

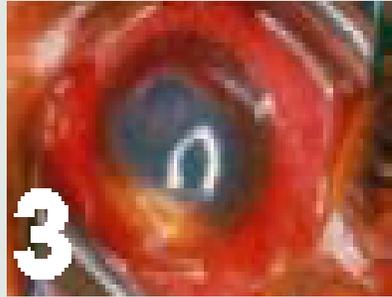
Five-year-old girl. Severe pain and loss of vision for three days. Used traditional eye medicines one week ago. VA CF.



4

Six-year-old male. Painful eye for ten days. Had malaria one month ago. Corneal sensation reduced when tested. VA 6/60.

# ANSWERS

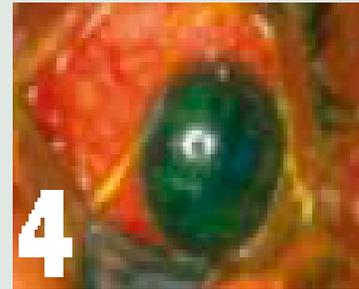


3

*Five-year-old girl. Severe pain and loss of vision for three days. Used traditional eye medicines one week ago. VA CF.*

## **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.

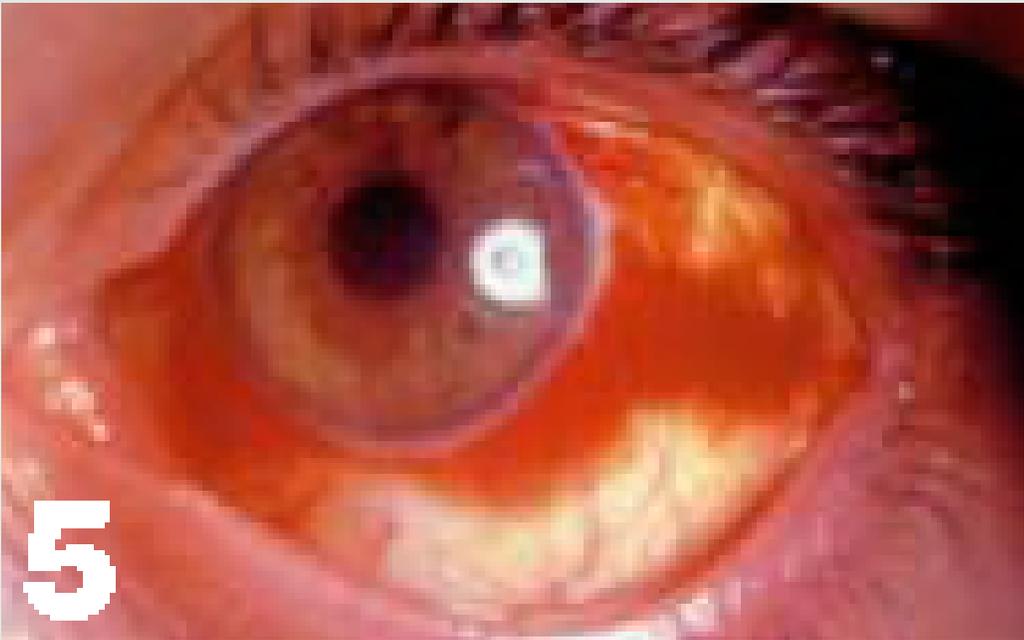


4

*Six-year-old male. Painful eye for ten days. Had malaria one month ago. Corneal sensation reduced when tested. VA 6/60.*

## **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.