

EYE TRAUMA: INCIDENCE

- 2.5 million eye injuries per year in U.S.
- 40,000–60,000 of eye injuries lead to visual loss

Final visual outcome of many ocular emergencies depends on prompt, appropriate triage, diagnosis, and treatment.



Marked lid swelling after blunt trauma may conceal a ruptured globe.

VISION HISTORY

- Is one eye affected, or both?
- What is your current level of vision?
- Was vision normal prior to trauma?

ADDITIONAL HISTORY

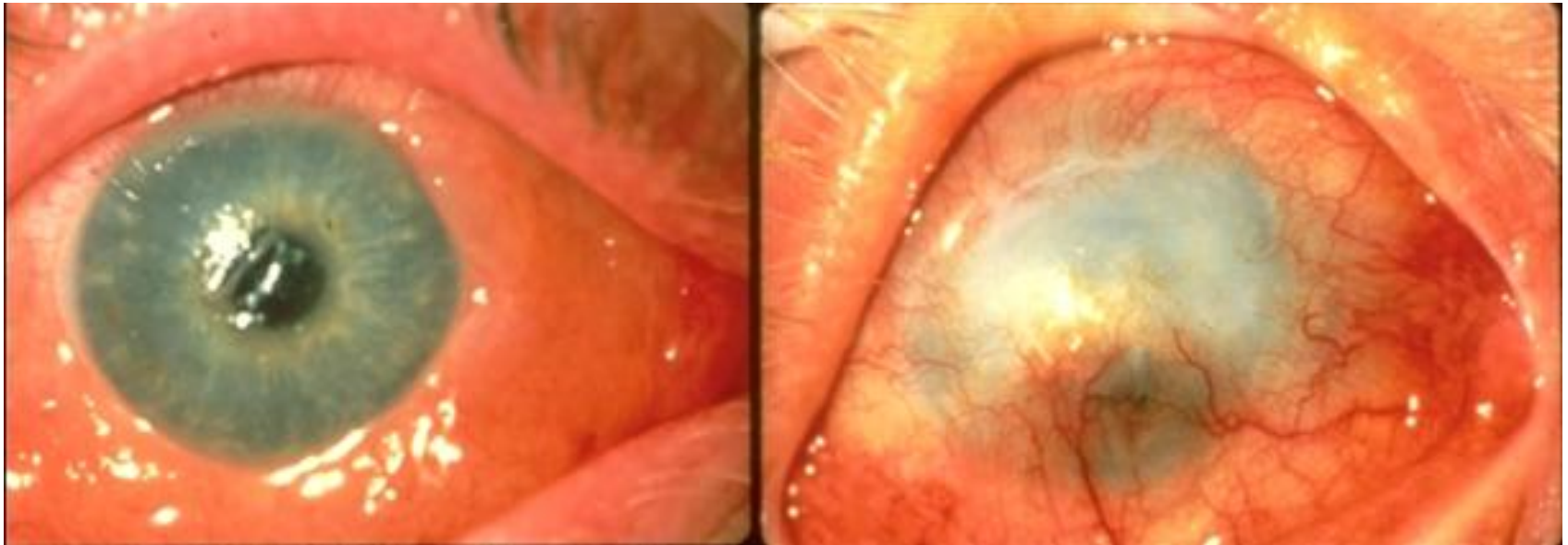
- What symptoms do you have other than decreased vision?
- How long have you had symptoms?
- Have you had any eye surgery prior to trauma?
- Details of trauma?

COMPLETE EYE EXAMINATION

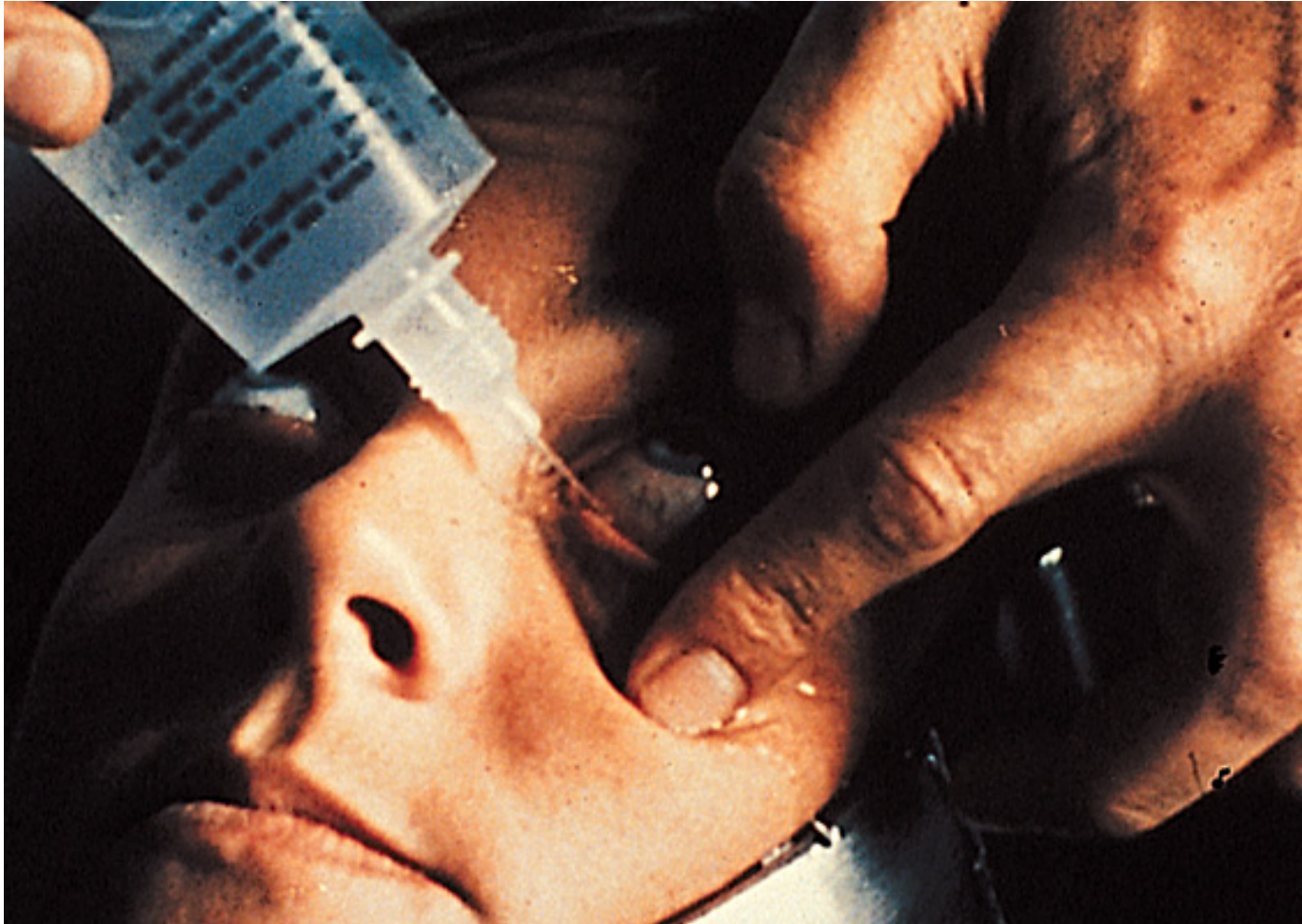
- Vision
- External exam
- Pupils
- Motility exam
- Anterior segment
- Ophthalmoscopy
- Intraocular pressure
- Peripheral vision

CHEMICAL BURNS

- A vision-threatening emergency
- Immediate irrigation essential



Acute and chronic stages of alkali burn



Irrigation of chemical burns should begin immediately following contact with the substance and continue upon arrival at the emergency department.

CHEMICAL BURNS: INITIAL MANAGEMENT

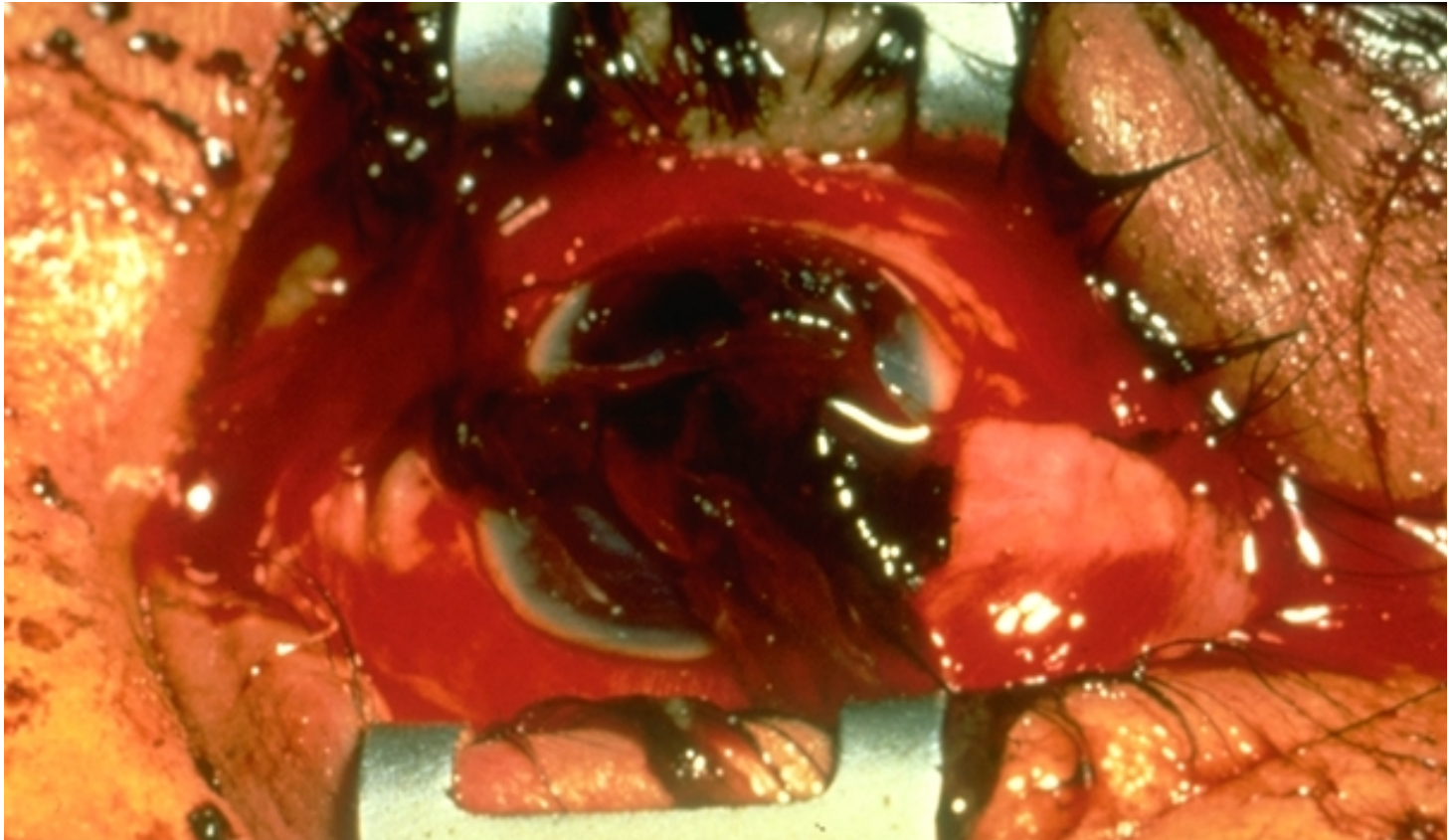
- Instill topical anesthetic
- Check for and remove foreign bodies
- Institute copious irrigation



Ocular irrigation

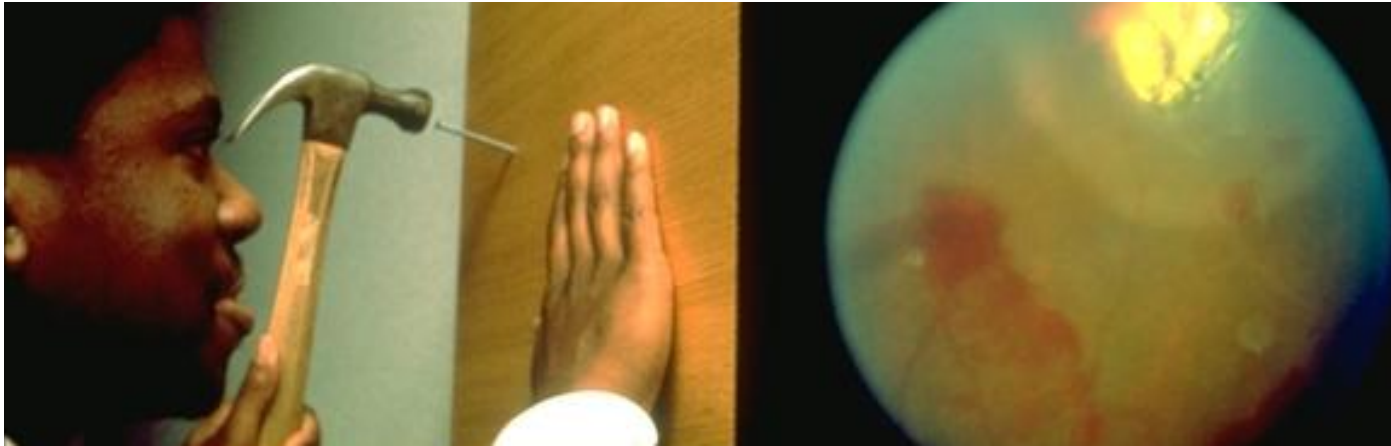
CHEMICAL BURNS: TREATMENT FOLLOWING IRRIGATION

- Instill topical cycloplegic and topical antibiotic
- Shield eye
- Refer promptly to ophthalmologist



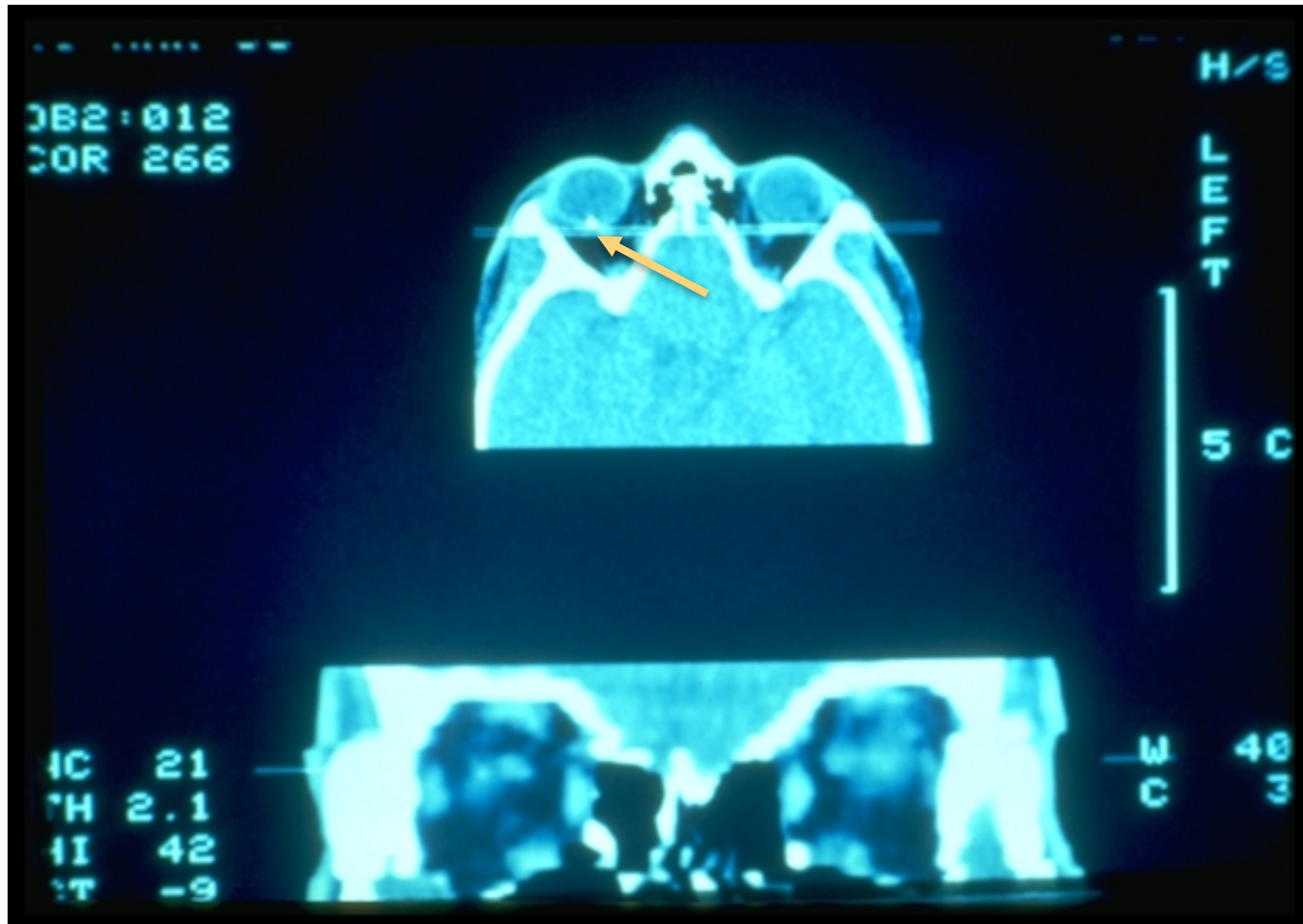
Ruptured or lacerated globe

SUSPECT A RUPTURED GLOBE IF



- Severe blunt trauma
- Sharp object
- Metal-on-metal contact

Treatment: Ruptured or Lacerated Globe



Intraocular foreign body seen on CT scan

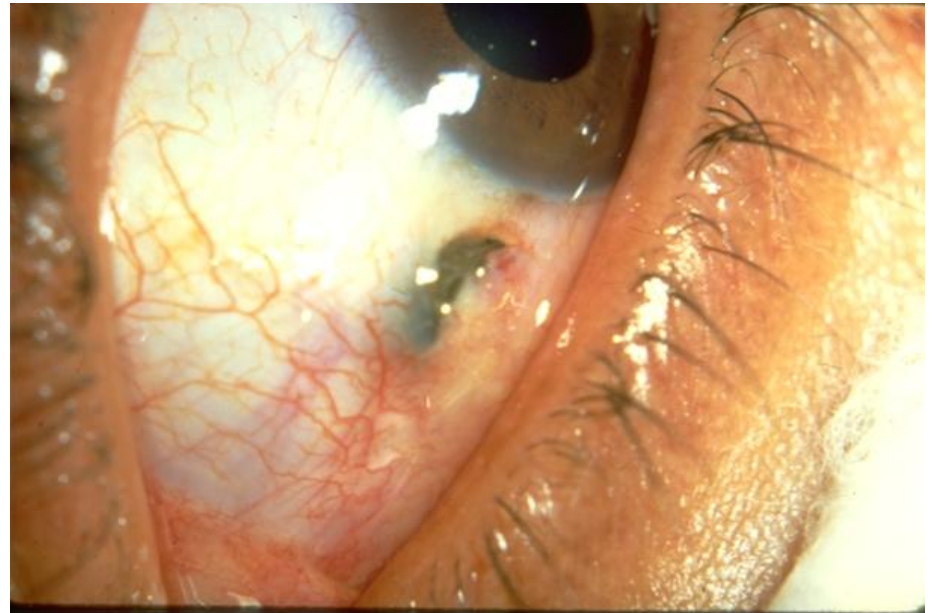
SUSPECT A RUPTURED GLOBE IF

- Bullous subconjunctival hemorrhage



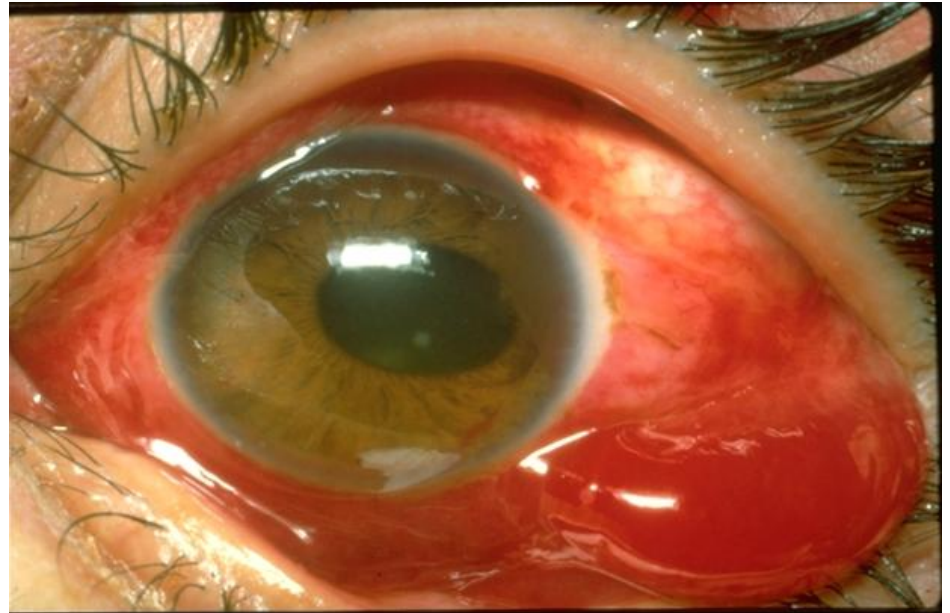
SUSPECT A RUPTURED GLOBE IF

- Uveal prolapse (iris or ciliary body)

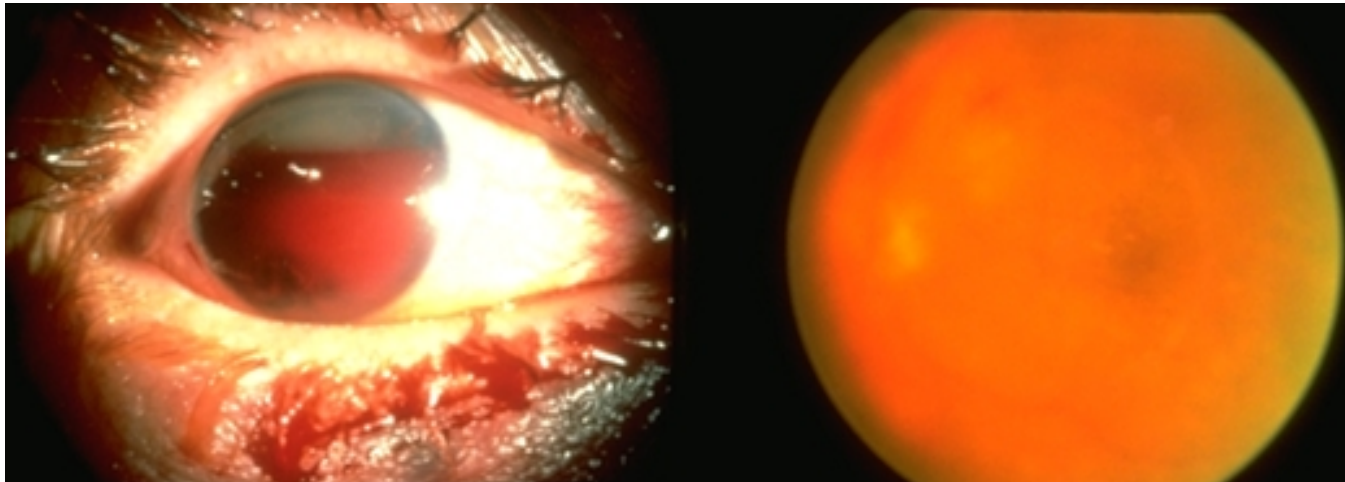


SUSPECT A RUPTURED GLOBE IF

- Irregular pupil



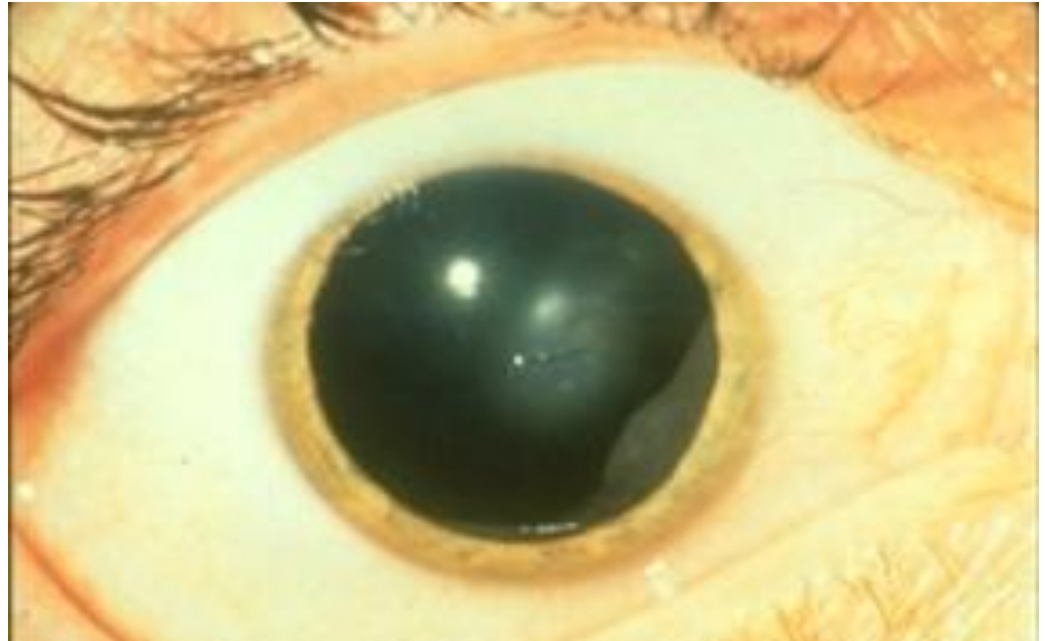
SUSPECT A RUPTURED GLOBE IF



- Hyphema
- Vitreous hemorrhage

SUSPECT A RUPTURED GLOBE IF

- Lens opacity



RUPTURED GLOBE

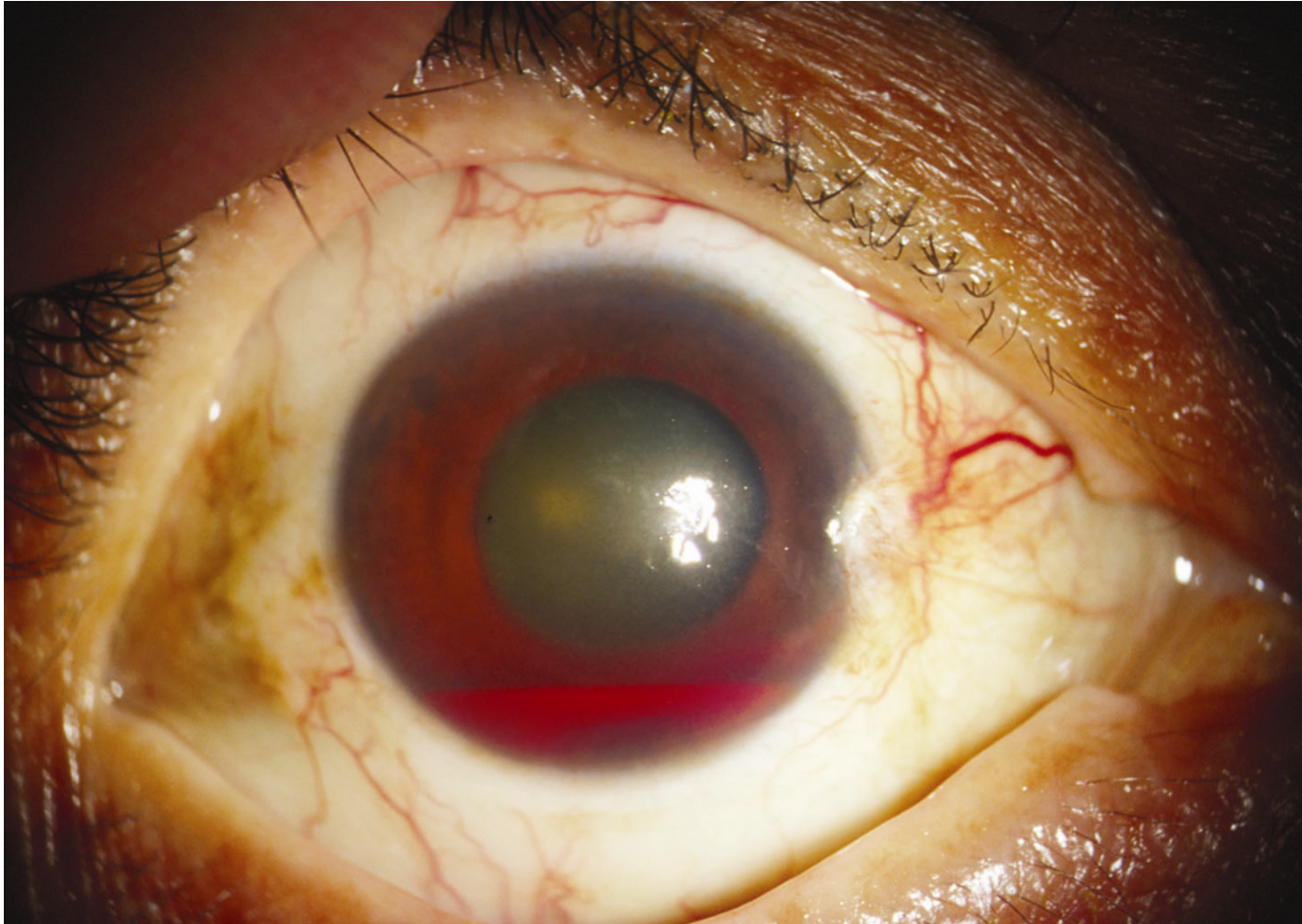
- Suspect if intraocular pressure is lowered
- Evaluate cautiously to avoid extrusion of intraocular contents

IF GLOBE RUPTURE OR LACERATION IS SUSPECTED

- Stop examination
- Shield the eye (do not patch)
- Give tetanus prophylaxis
- Refer immediately to ophthalmologist



Protective eye shields



Hyphema from blunt ocular trauma

HYPHEMA: MANAGEMENT

- Assume globe is potentially ruptured
- Shield eye and refer to ophthalmologist
- Ophthalmologic management:
 - Restricted activity
 - Protective metal shield
 - Topical cycloplegic and corticosteroids
 - Possibly systemic corticosteroids or antifibrinolytic agents

HYPHEMA: COMPLICATIONS

- Rebleeding into anterior chamber
- Glaucoma
- Associated ocular injuries in 25% of patients



Blunt orbital trauma

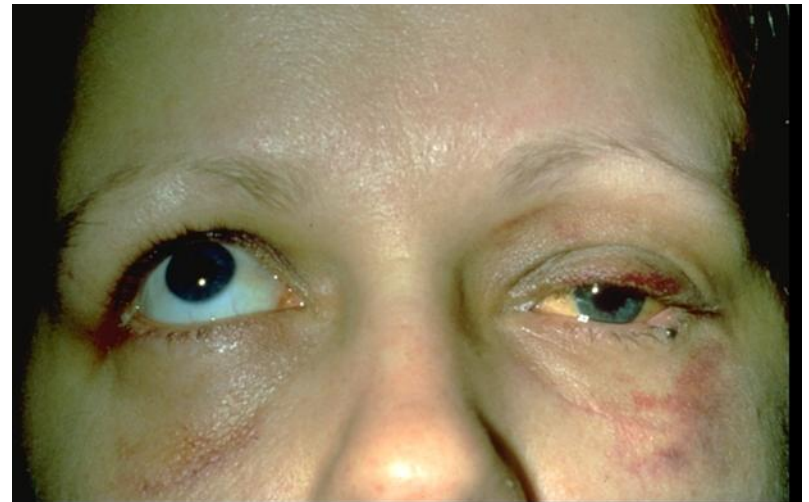
SEVERE ORBITAL HEMORRHAGE

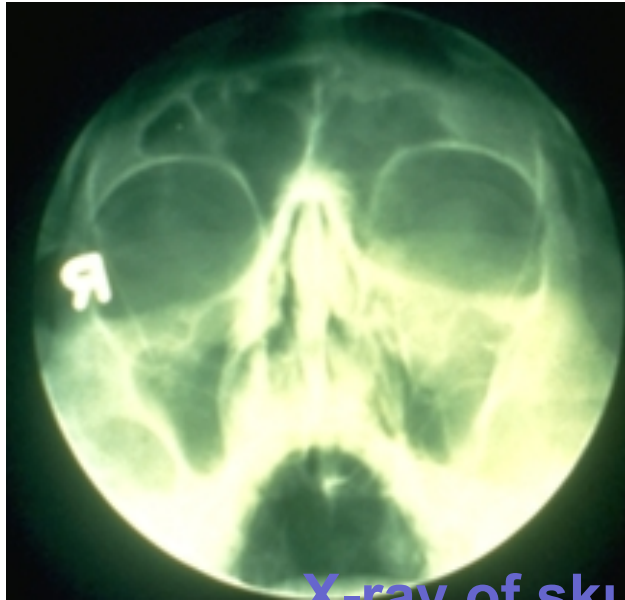
- Bullous subconjunctival hemorrhage
- Proptosis
- Corneal exposure
- Elevated intraocular pressure



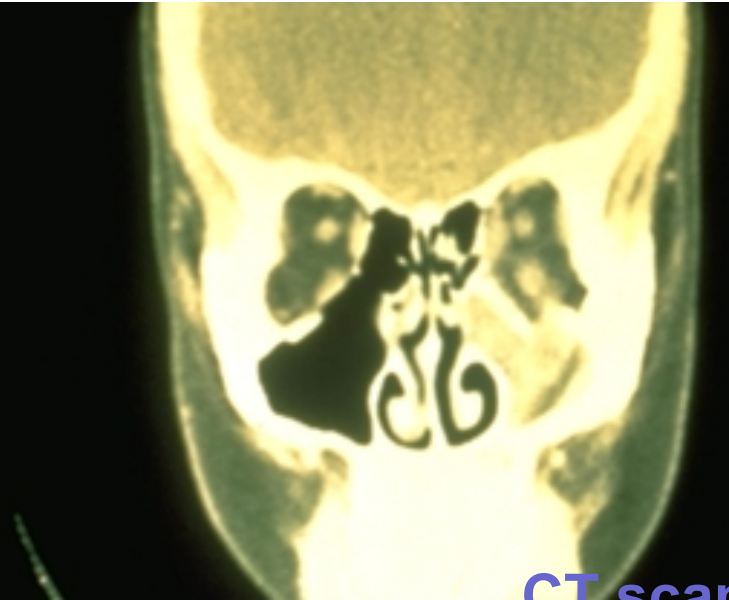
ORBITAL FRACTURES

- Assess ocular motility
- Assess sensation over cheek and lip
- Palpate for bony abnormality of orbital rim





**X-ray of skull
(Waters or Caldwell view
views)**



**CT scan
(coronal and sagittal
views)**

ORBITAL TRAUMA: BLOW-OUT FRACTURES

- Surgery if persistent, nontransient diplopia or poor cosmesis
- Must rule out occult ocular trauma

LID LACERATIONS

- Can result from sharp or blunt trauma
- Rule out associated ocular injury



Full-thickness eyelid laceration



**Laceration involving medial third of eyelid
may involve tear drainage systems.**



Deep laceration of upper eyelid can damage levator muscle.



Deep laceration of upper eyelid with fat prolapse



Eyelid laceration with significant loss of tissue

SUPERFICIAL LID LACERATIONS

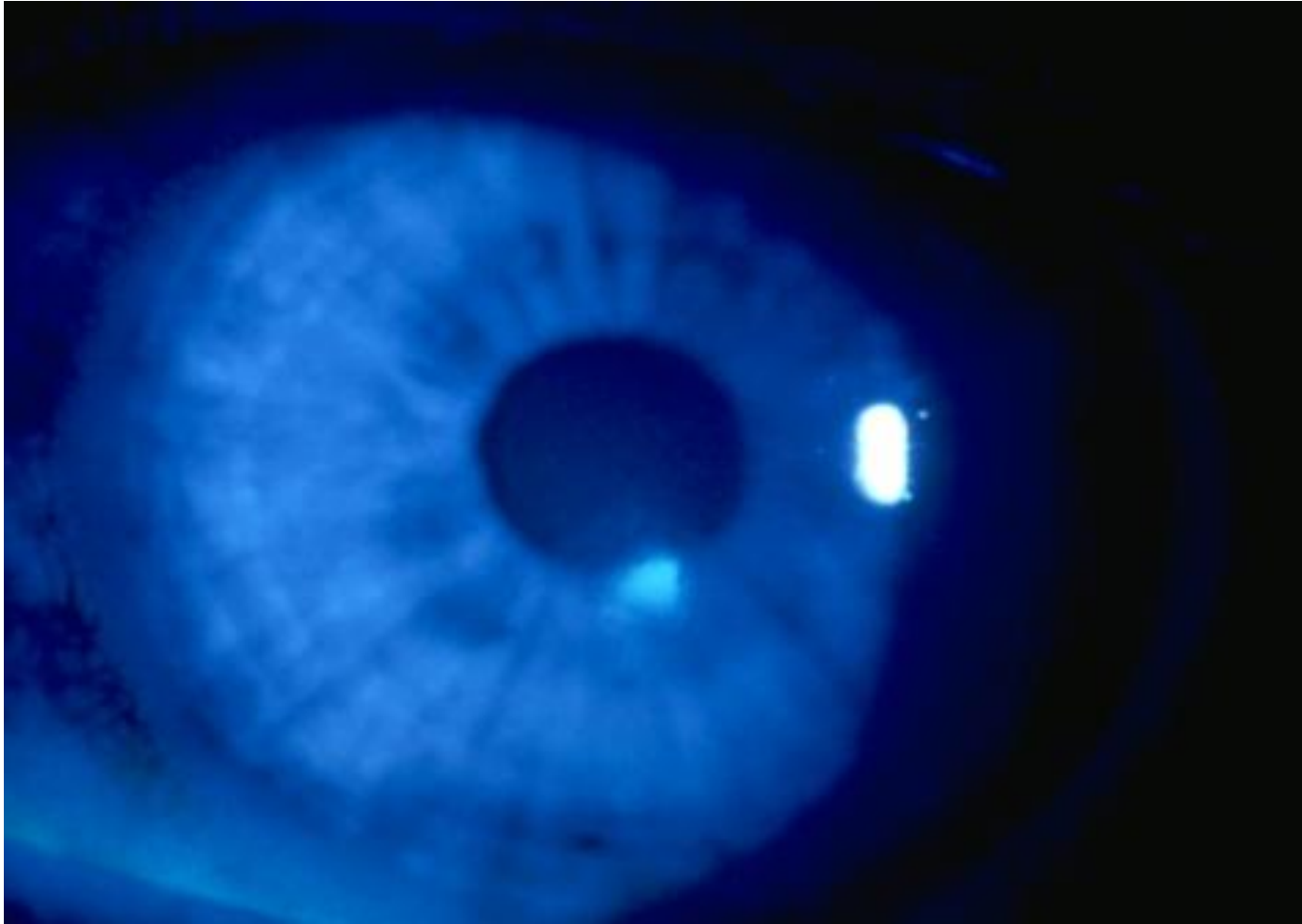
- Avoid lid margin retraction
- Remove superficial foreign bodies
- Rule out deeper foreign bodies
- Give tetanus prophylaxis

CORNEAL ABRASIONS: SYMPTOMS

- Foreign-body sensation
- Pain
- Tearing
- Photophobia



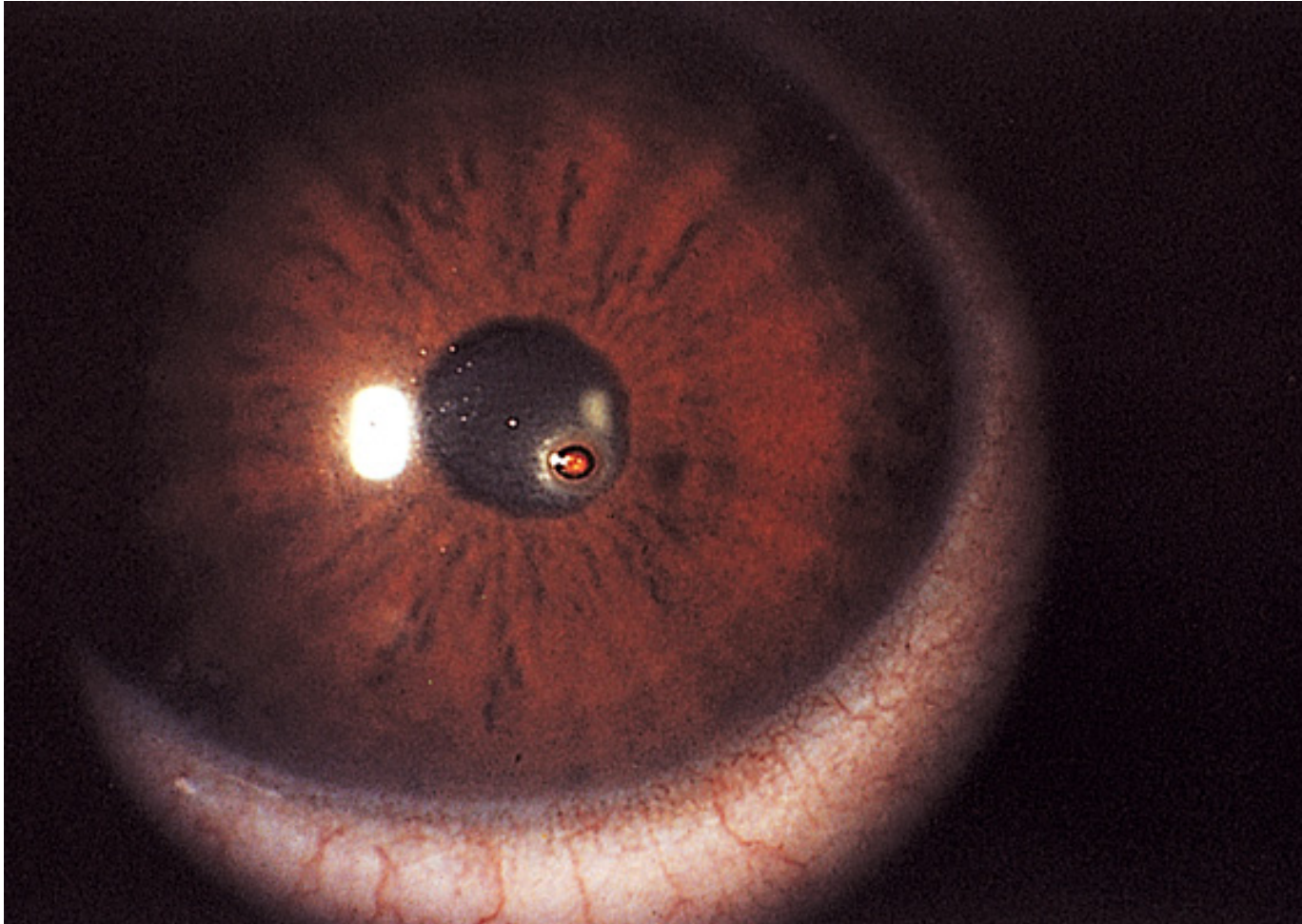
Fluorescein strip applied to the conjunctiva



Corneal abrasion seen in blue illumination



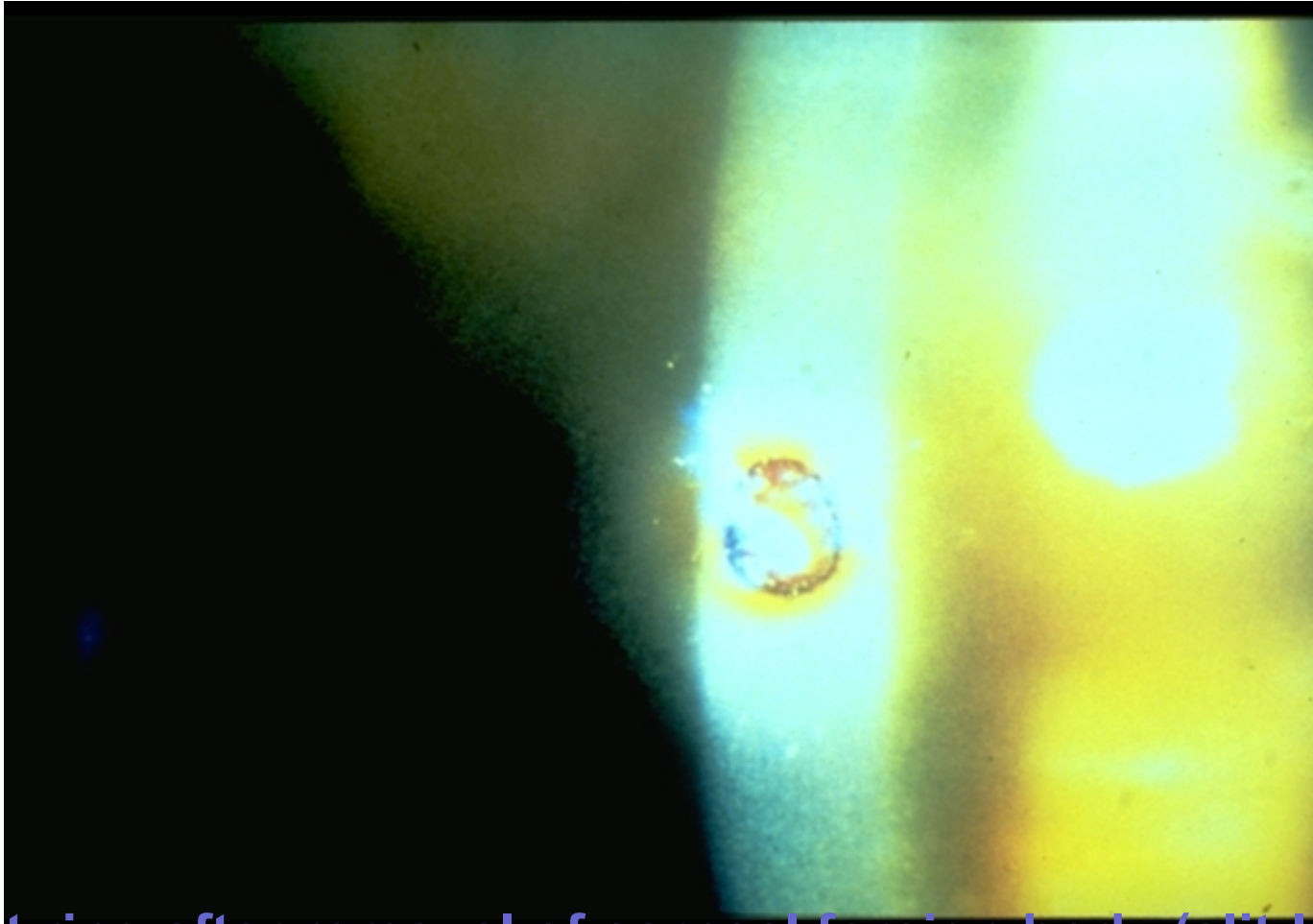
Foreign body lodged under upper eyelid



Corneal foreign body



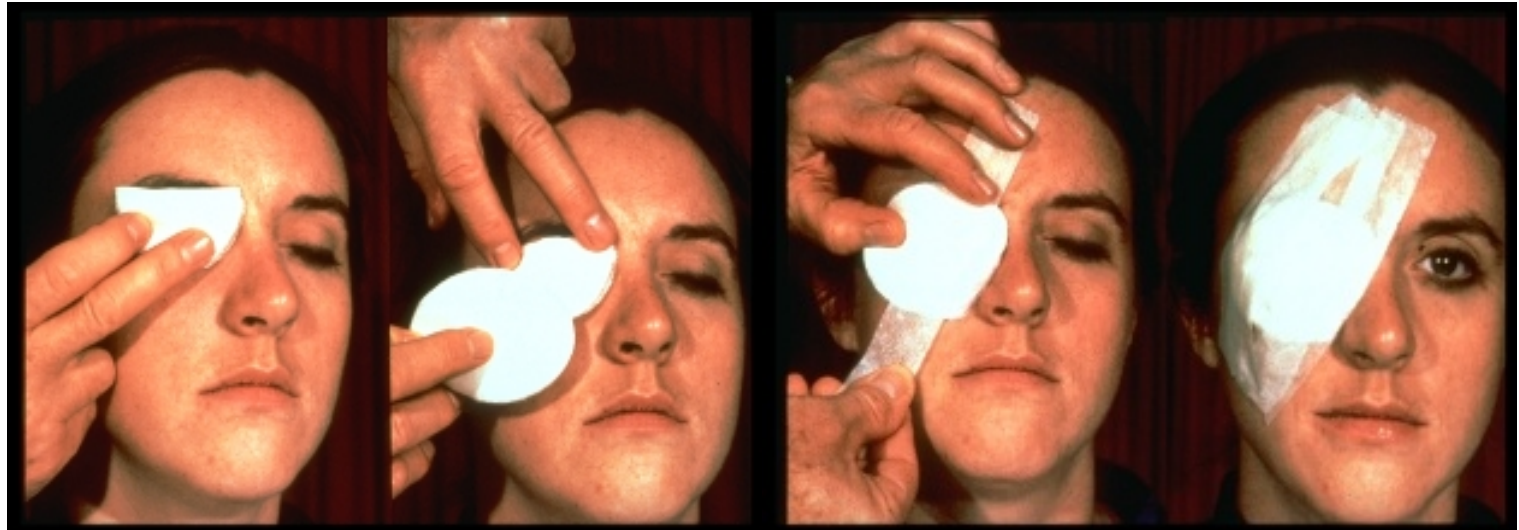
Removal of corneal foreign body using magnification



Rust ring after removal of corneal foreign body (slit-lamp view)

CORNEAL ABRASIONS: TREATMENT

- Topical cycloplegic
- Topical antibiotic
- Pressure patch over eye is an option
- Systemic analgesics often needed



Placement of a pressure patch

CORNEAL ABRASIONS: CONTACT LENS WEARERS

- Remove contact lens
- Antibiotics for Gram-negative organisms
- Do not patch
- Follow up with ophthalmologist in 24 hours

CORNEAL ABRASIONS: FOLLOW-UP

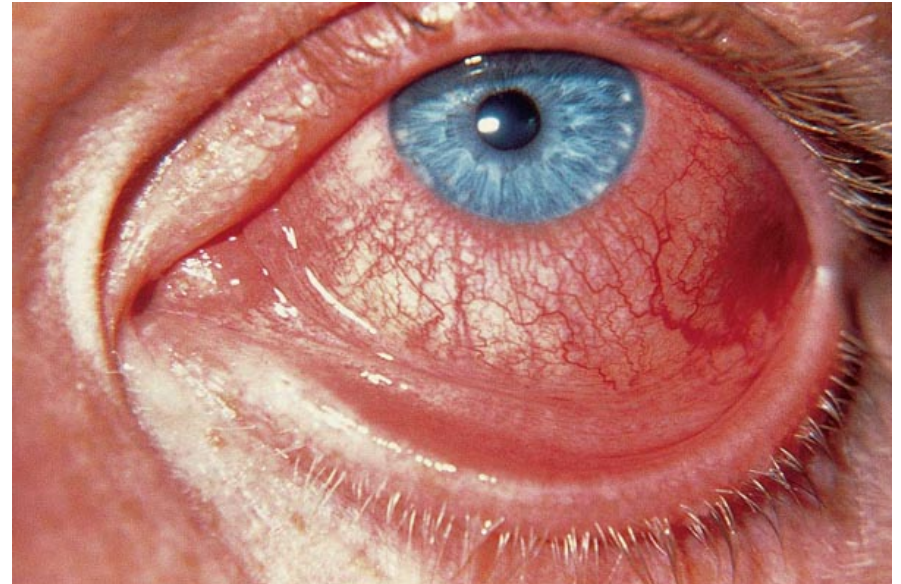
- Follow up in 24 hours
- Refer to ophthalmologist if
 - Not healed in 24 hours
 - Abrasion is related to contact lens wear
 - White corneal infiltrate develops

NONTRAUMATIC RED EYE: POSSIBLE CAUSES

- Conjunctivitis
- Iritis (uveitis)
- Corneal inflammation/infection
- Acute angle-closure glaucoma

VIRAL CONJUNCTIVITIS: CLINICAL SIGNS

- Conjunctival inflammation
- Watery or mucoid discharge
- Preauricular lymphadenopathy +/-
- Usually bilateral



BACTERIAL CONJUNCTIVITIS

- Mucopurulent discharge
- Often bilateral
- Treatment:
 - Topical antibiotics
 - Warm compresses



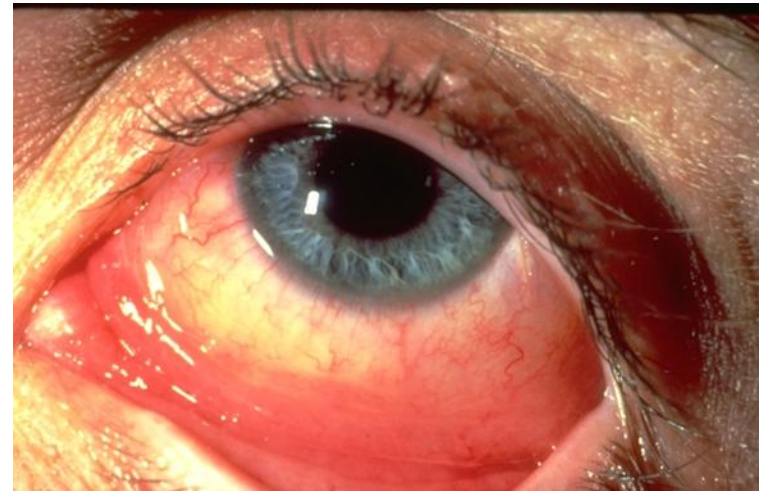
GONOCOCCAL CONJUNCTIVITIS

- Markedly purulent
- Requires
parenteral and
topical antibiotics



ALLERGIC CONJUNCTIVITIS

- Signs and Symptoms:
 - Tearing, itching, redness,
 - +/- White, ropy discharge
 - +/- Presence of other allergy symptoms
- Treatment:
 - Cool compresses
 - Topical antihistamines, vasoconstrictors, mast cell stabilizers, NSAIDs

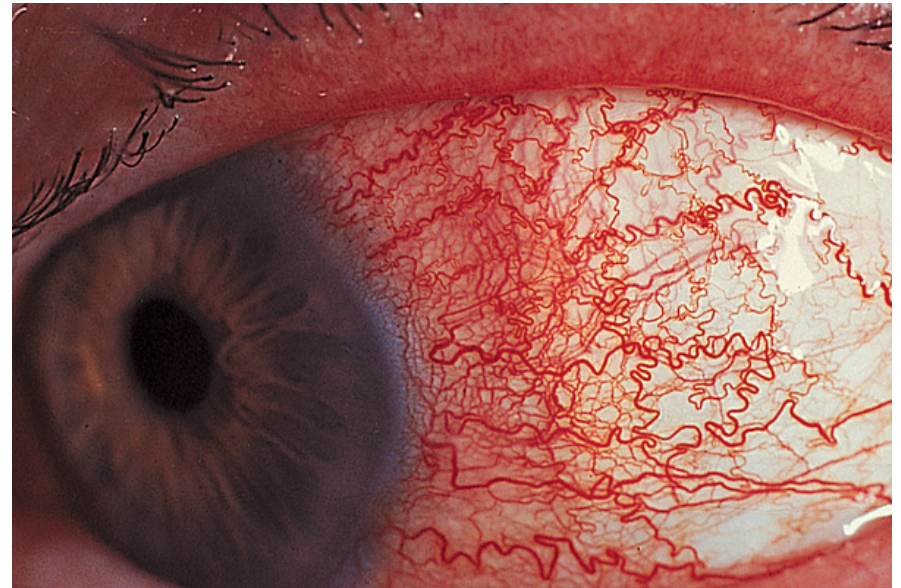


TOPICAL CORTICOSTEROIDS

- Avoid in routine conjunctivitis
- Steroid complications:
 - Cataract
 - Glaucoma
 - Exacerbation of herpes simplex keratitis and corneal ulcers

IRITIS: SIGNS AND SYMPTOMS

- Intraocular inflammation
- Photophobia and deep ocular pain
- Circumcorneal redness (ciliary flush)
- Pupil may be smaller



CORNEAL INFLAMMATION OR INFECTION

- Pain, foreign-body sensation
- Decreased vision
- Corneal infiltrate



ACUTE ANGLE-CLOSURE GLAUCOMA: SIGNS & SYMPTOMS

- Severe ocular pain
- Decreased vision
- Headache, nausea/
vomiting
- Halos around lights
- Pupil moderately
dilated
- Hazy cornea
- Elevated IOP



ACUTE ANGLE-CLOSURE GLAUCOMA: INITIAL TREATMENT

- Timolol maleate 0.5% drops
- Apraclonidine 0.5% drops
- Pilocarpine 2% drops
- Acetazolamide 500 mg IV or po, or
dorzolamide 2% drops
- IV mannitol

PRESEPTAL CELLULITIS: SIGNS & SYMPTOMS

- Lid swelling and erythema
- Visual acuity, motility, pupils, and globe are normal



PRESEPTAL CELLULITIS: MANAGEMENT CONSIDERATIONS

- Warm compresses
- Systemic antibiotics
- X-rays if history of trauma/sinus disease

ORBITAL CELLULITIS: SIGNS AND SYMPTOMS

- Pain
- Decreased vision
- Impaired ocular motility
- Afferent pupillary defect
- Proptosis
- Optic nerve swelling



ORBITAL CELLULITIS: MANAGEMENT

- Immediate treatment
- Nasopharynx and blood cultures
- Intravenous antibiotics
- Surgery may be necessary
- Rule out mucormycosis in immunocompromised patients



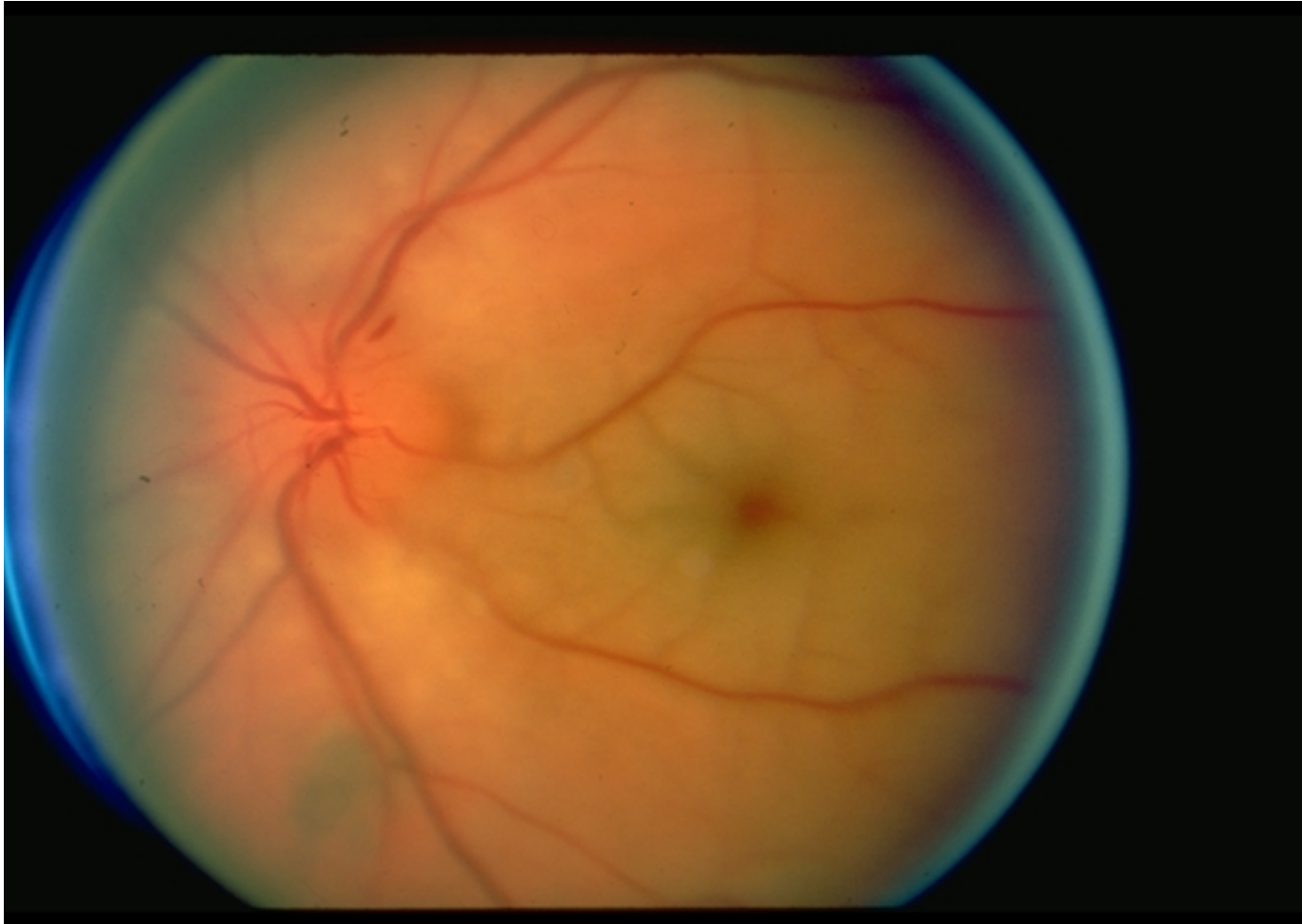
Herpes zoster ophthalmicus

HERPES ZOSTER OPHTHALMICUS

- Prodromal fever and scalp tenderness
- Respect for forehead midline
- Ocular involvement
 - Corneal lesions
 - Iritis

SUDDEN, NONTRAUMATIC, MONOCULAR VISION LOSS

- Most often caused by vascular occlusion
- Less commonly caused by retinal or optic nerve lesions



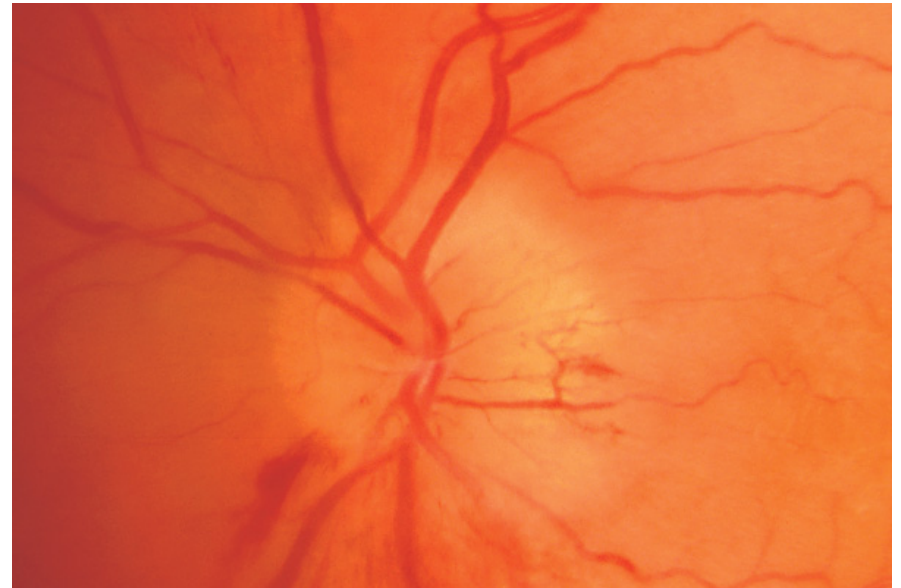
Central retinal artery occlusion (CRAO)

CRAO: MANAGEMENT

- Rebreathe CO₂
- Timolol maleate 0.5%
- IV acetazolamide 500 mg
- Massage globe with lids closed
- Paracentesis in some cases

TEMPORAL ARTERITIS: SIGNS AND SYMPTOMS

- Unilateral loss of vision
- Afferent pupillary defect
- Optic nerve swelling
- Scalp/forehead tenderness
- +/- Chewing pain
- +/- Polymyalgia rheumatica



TEMPORAL ARTERITIS: MANAGEMENT

- Obtain ESR and C-reactive protein
- Administer systemic corticosteroids
- Perform temporal artery biopsy

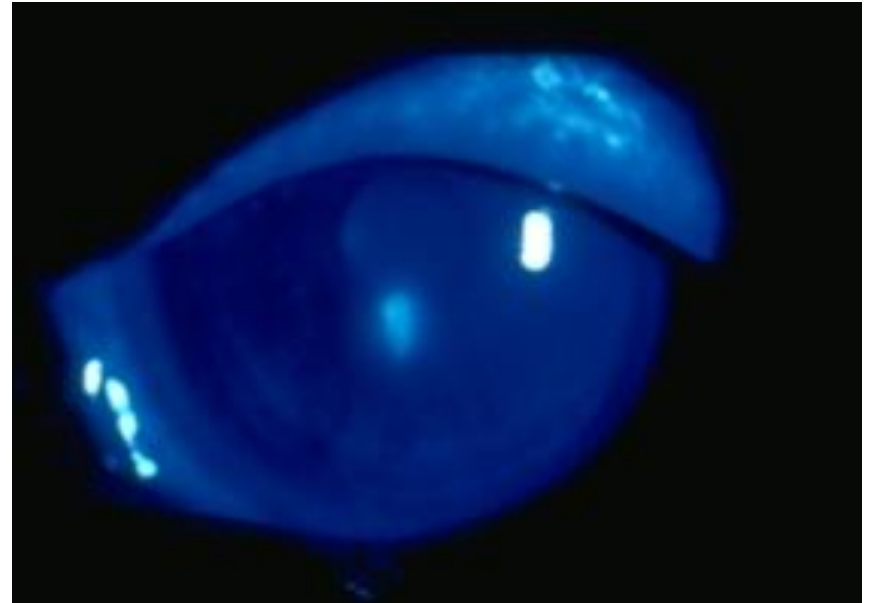
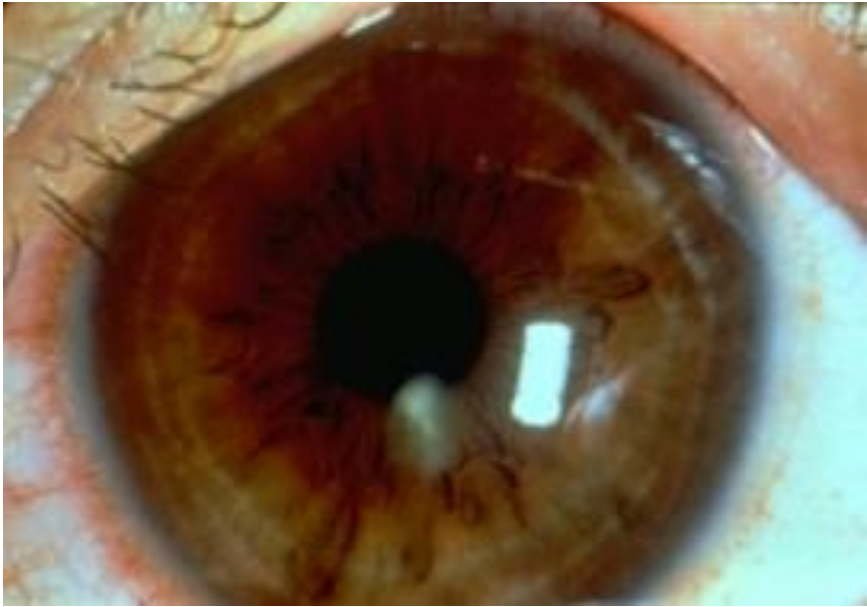
HARD CONTACT LENS ABRASIONS

- Remove contact lens
- Rule out corneal infections
- Instill cycloplegic and antibiotic
- Pressure patch

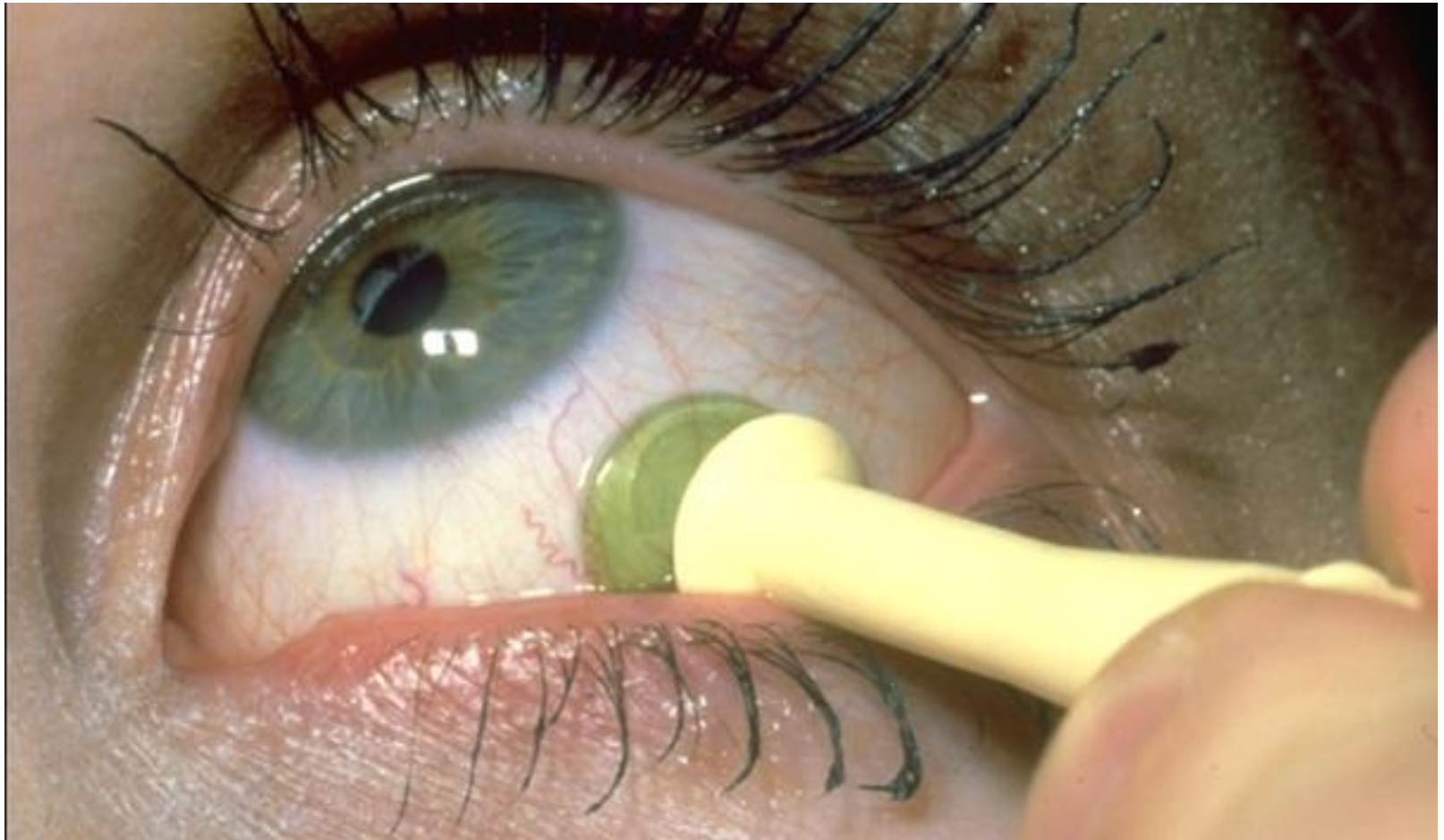
SOFT CONTACT LENS WEARER

With pain, redness, decreased vision:

- Rule out corneal ulcer (epithelial defect and stromal infiltrate)
- No patching



Corneal infiltrate and epithelial defect



Removing a hard contact lens with a suction cup

EYE TRAUMA: PATIENT CARE/ PRESERVATION OF VISION

- Timely, accurate emergency diagnosis and treatment
- Appropriate ophthalmologic referral