Primary Care for the Red Eye

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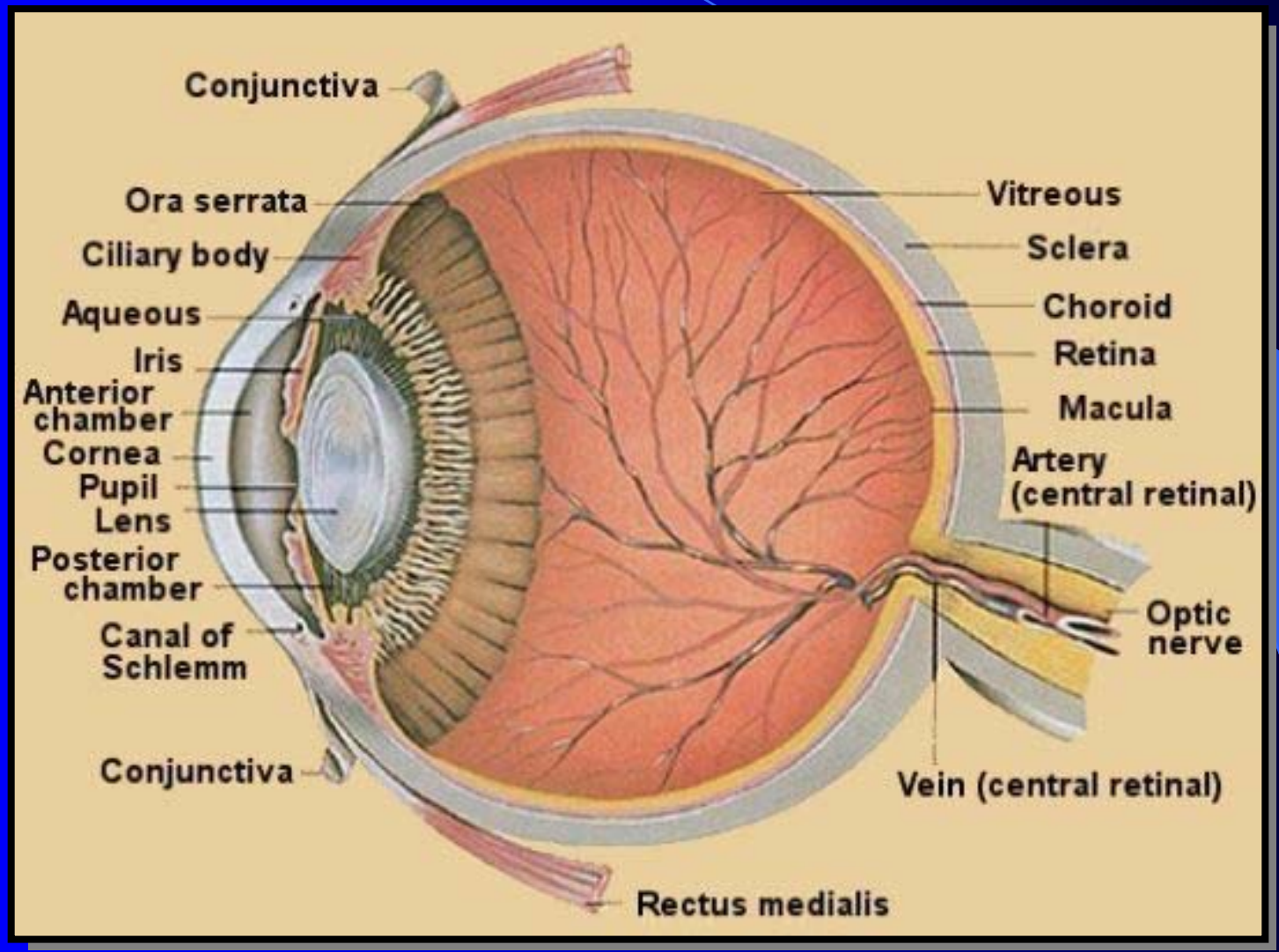
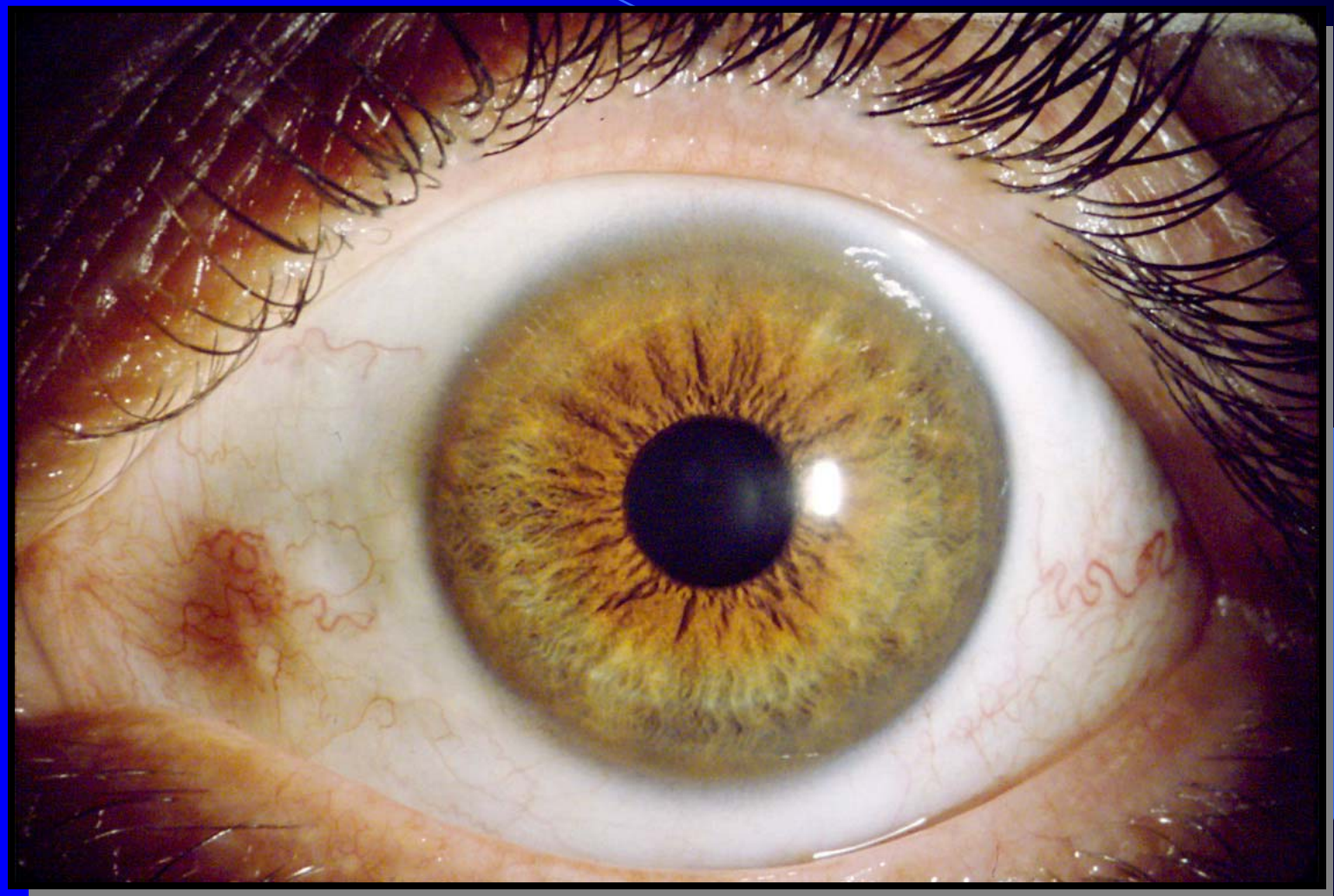
September 2, 2003

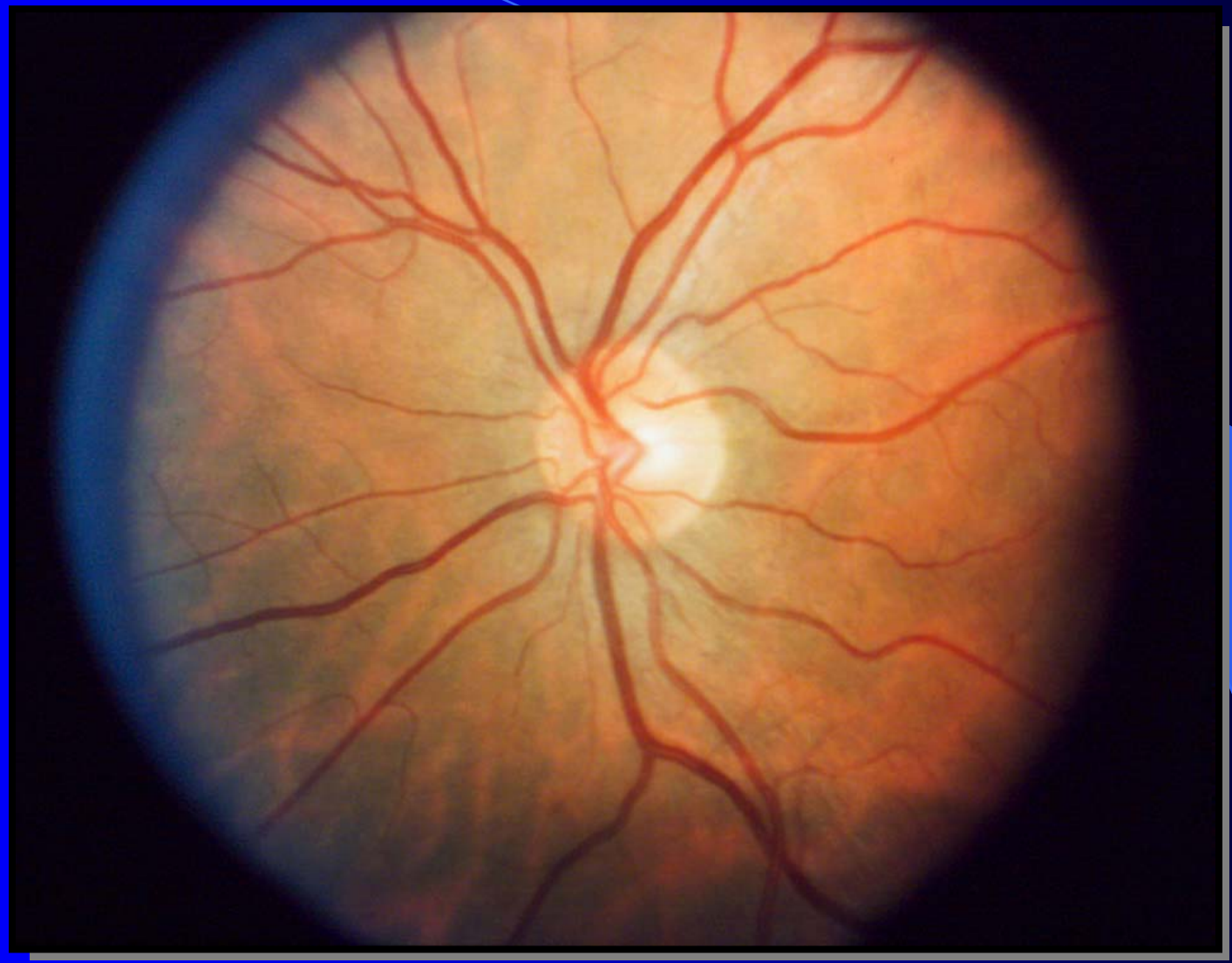
When in Doubt

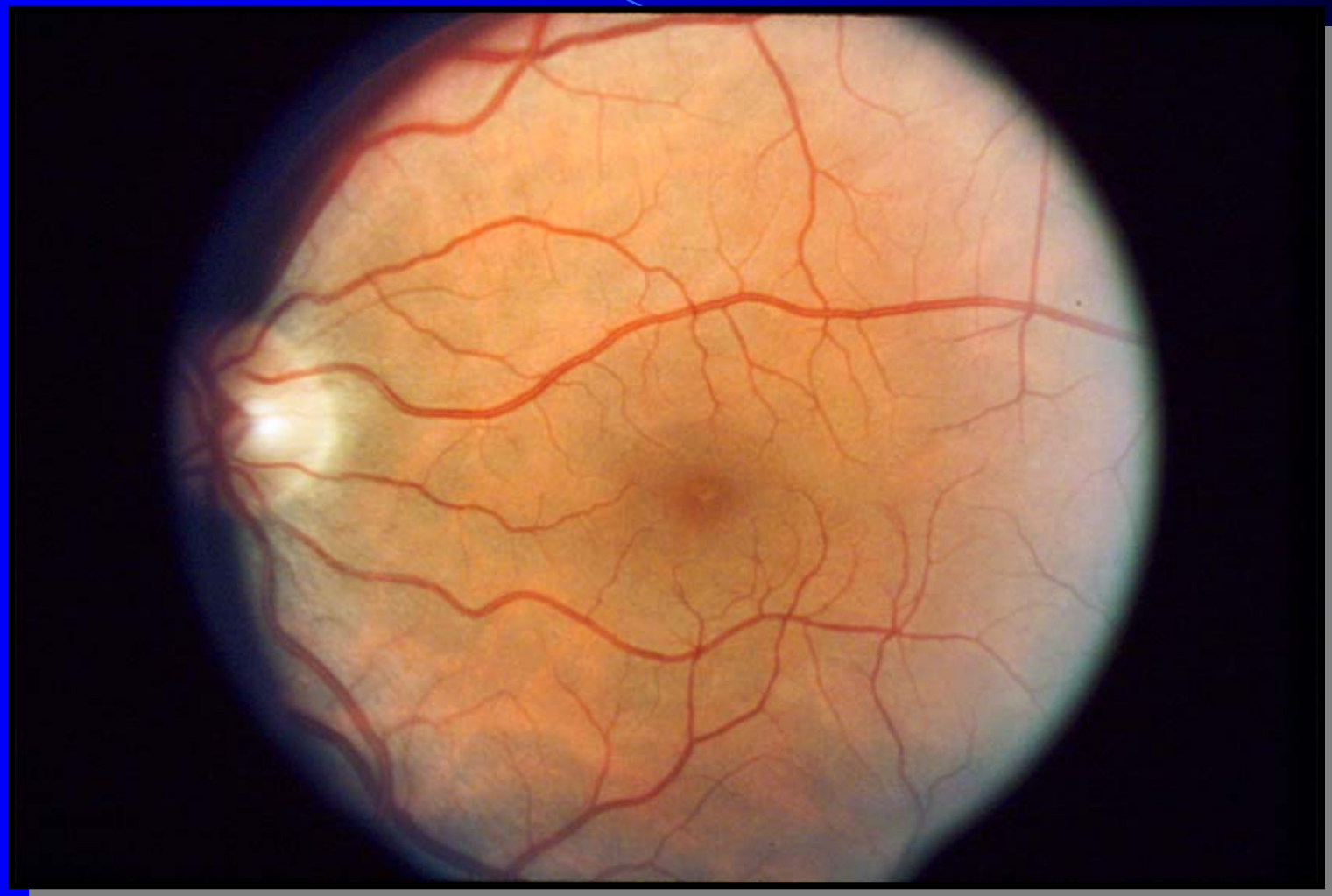
- Ophthalmology Consult
  - 6-4091
  - Please, Please, Please…check the vision prior to calling. (Call a cards consult without an EKG?)
  - "Vision Intact" does not count
  - CN II-XII, PERRLA…careful
  - Don't wait until it's too late
    - Gen Med Example
    - Leukemia Example

Anatomy


Conjunctiva
Ora serrata
Ciliary body
Aqueous
Iris
Anterior chamber
Cornea
Pupil
Lens
Posterior chamber
Canal of Schlemm
Conjunctiva
Rectus medialis
Vitreous
Sclera
Choroid
Retina
Macula
Artery (central retinal)
Optic nerve
Vein (central retinal)







History

- Demographic data (name, DOB, sex, race, occupation)
- Identity of other pertinent health care providers
- Chief complaint
- History of present illness
- Present status of vision (patient's perception of his/her visual status) and ocular symptoms
- Past ocular history (eye diseases, injuries, diagnoses, treatments, surgeries, medications)
- Past systemic history (PMH, all, meds, FH, soc)
- Family history of ocular disease

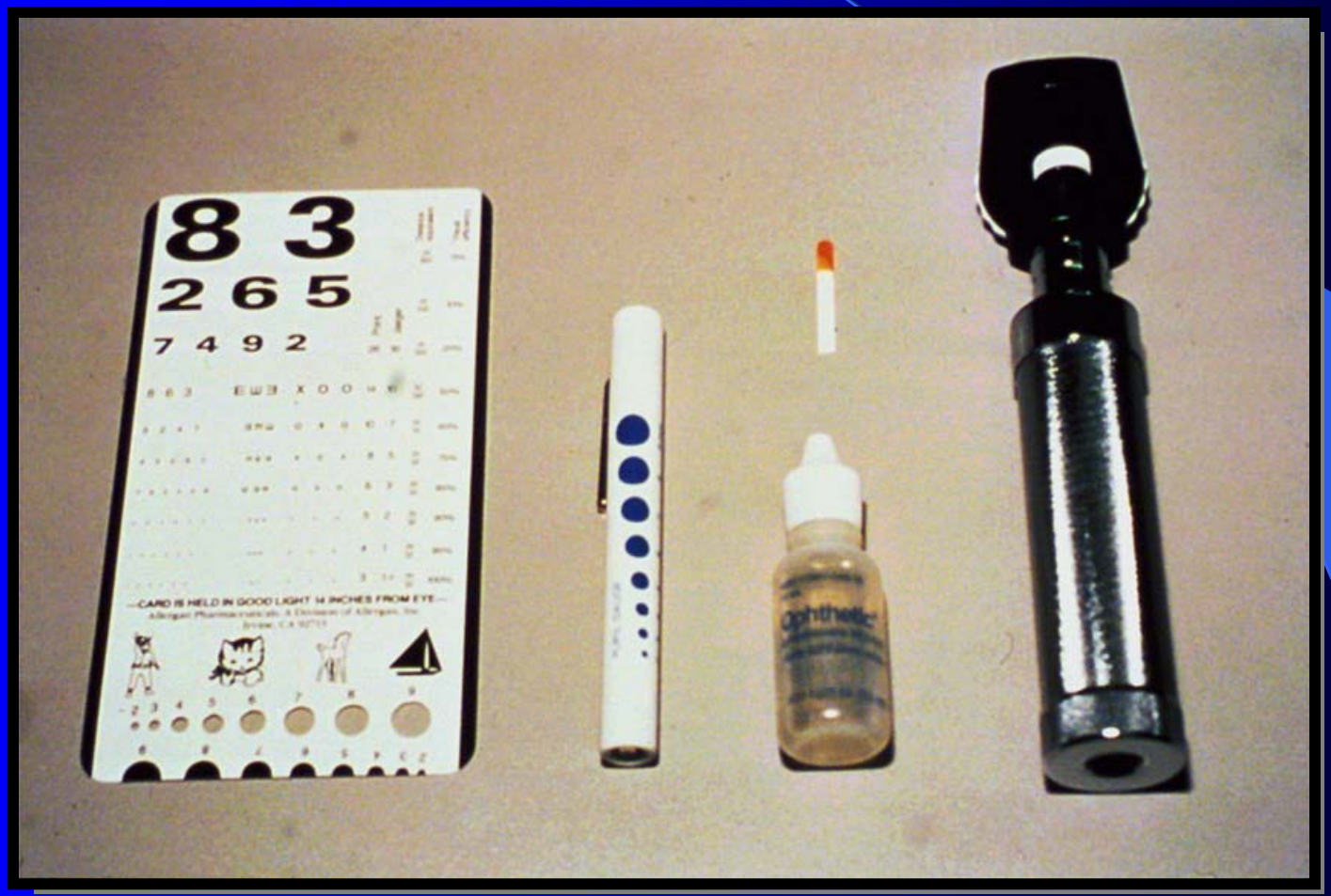
Eight Part Eye Exam

- ***Visual acuity***
  - With present correction (if available)
  - Distance and/or near
  - Examine each eye individually
- Pupillary exam
- Ocular alignment and motility
- Visual field
- Tonometry (intraocular pressure)
- External eye and ocular adnexa
- Anterior segment
- Posterior segment

Tools of the Trade

- Snellen acuity chart
- Near acuity card
- Color vision plates
- Penlight or Finnhoff transilluminator
- Direct ophthalmoscope
- Blue filter or Wood's lamp
- Tonopen
- Tetracaine or proparacaine
- Fluorescein drops or strips
- Small toy/pediatric fixation target

Tools of the Trade



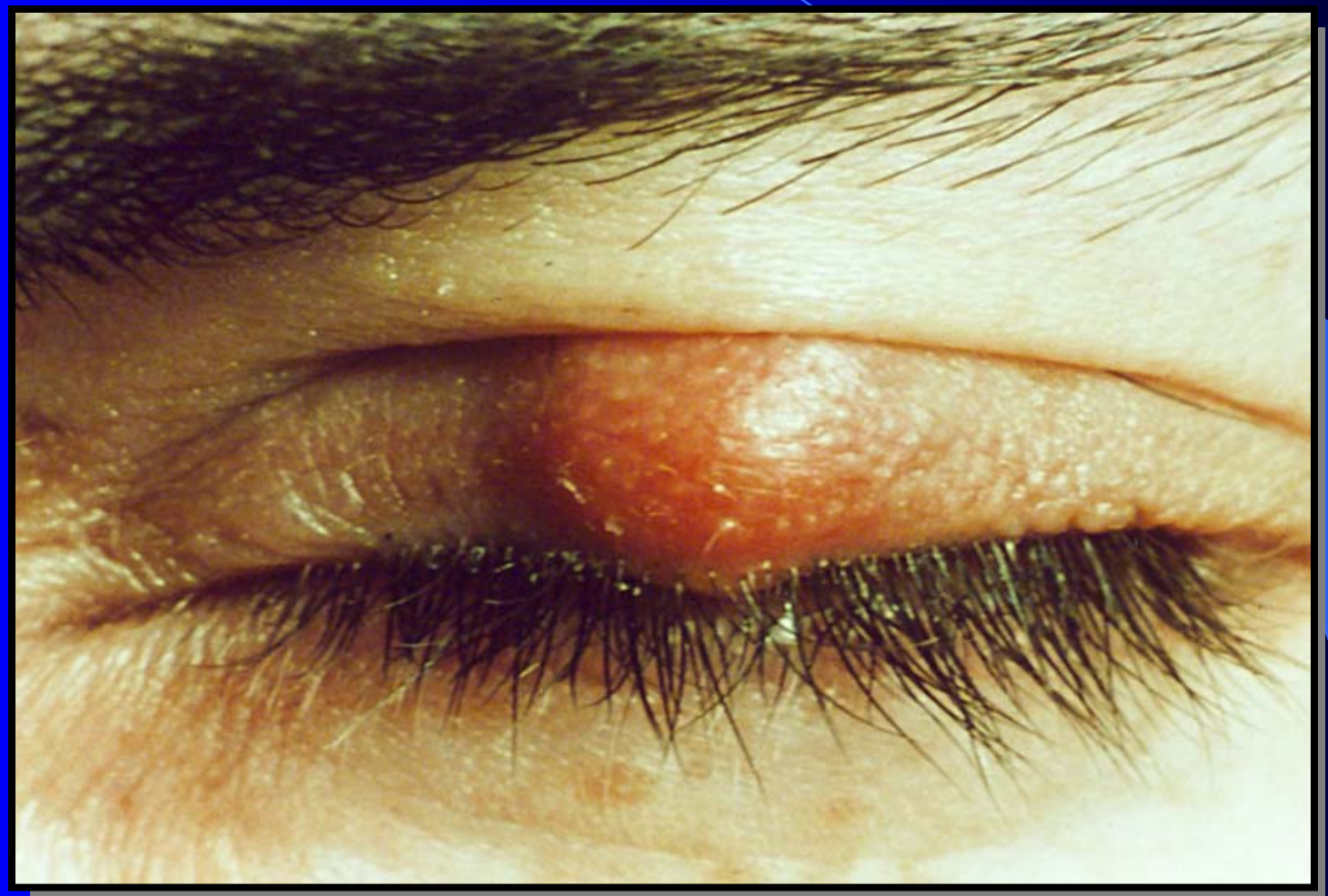
Blepharitis

- Common
- Chronic inflammation of eyelids, 3 types:
  - Seborrheic: with dandruff of brows/scalp
  - Staphylococcal infection: styes (hordeola)
  - Meibomian (lipid) gland dysfunction: chalazia
- Symptoms
  - Irritation/itching
  - Burning
  - Foreign body/gritty sensation
  - Tearing
  - +/- Photosensitivity
  - Intermittent blurred vision

Blepharitis

- Signs
  - Erythema of lid margins
  - Eyelash debris
  - Eyelid crusting
  - Chalazia and hordeola (styes)
  - Eyelash loss
  - Chronic conjunctivitis
- Treatment
  - Warm compresses, lid hygeine
  - Artificial tears
  - Occasional steroid/antibiotic ointment

Blepharitis



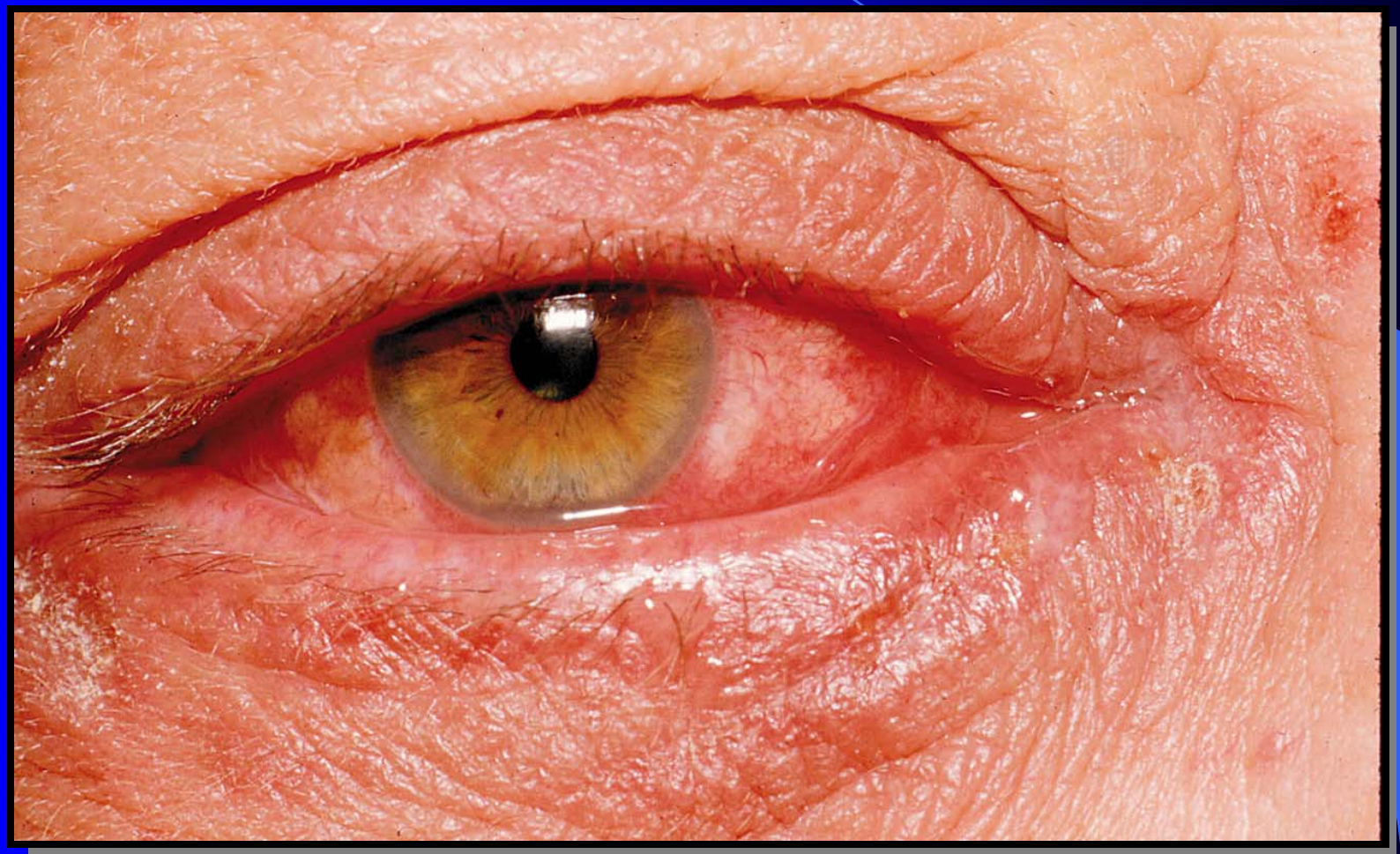
Viral Conjunctivitis

- Common
- “Pinkeye”
- Acute adenoviral infection
- Symptoms
  - Watering
  - Soreness
  - Itching
  - Light sensitivity
  - Intermittent blurred vision
  - Second eye often involved 3-7 days after first

Viral Conjunctivitis

- Signs
  - Diffuse conjunctival injection
  - Watery or mucoid discharge
  - Eyelid erythema/edema
  - Follicular conjunctivitis
  - Preauricular adenopathy
- Treatment
  - Self-limiting disease
  - Cold compresses
  - Artificial tears
  - +/- Topical vasoconstrictor/antihistamine
  - Infection control

Viral Conjunctivitis



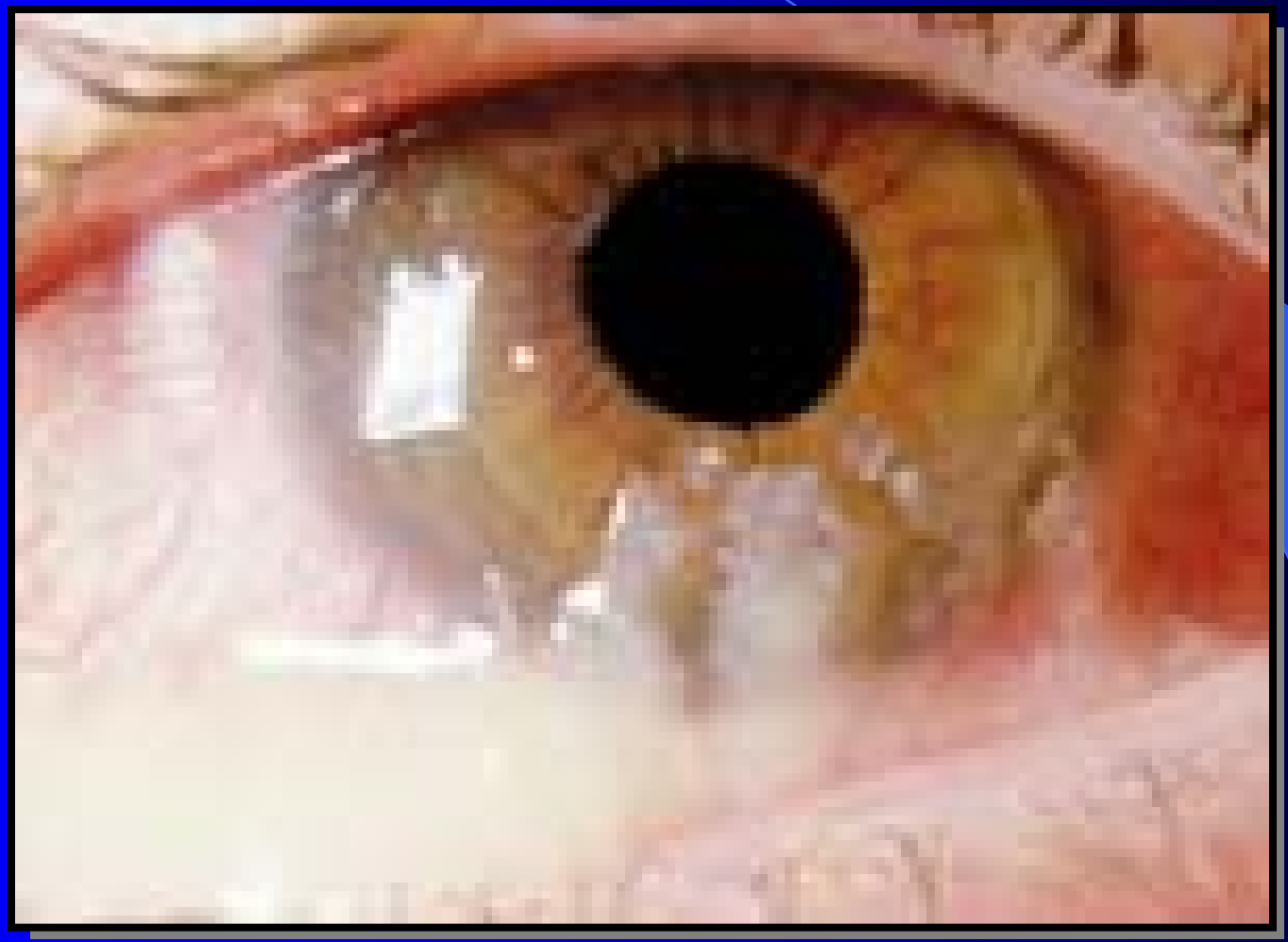
Bacterial Conjunctivitis

- Not common
- *Staphylococcus aureus, Haemophilus, Streptococcus pneumoniae, Moraxella*
- *N. gonorrhoeae, N. meningitidis* (rare)
- Symptoms
  - Irritation
  - Profuse discharge
  - Intermittent blurred vision
- Signs
  - Mucopurulent exudate
  - Lid erythema/edema
  - Diffuse conjunctival injection

Bacterial Conjunctivitis

- Workup
  - Gram's stain and conjunctival culture
- Treatment
  - Warm or cold compresses, artificial tears, +/- broad-spectrum antibiotics 4-6x/day
    - Fluoroqionolone (Ocuflox, Ciloxan, Quixin)
    - Polymyxin/trimethoprim (Polytrim)
    - Sulfacetamide (Sulamyd, Bleph-10)
- Ophthalmology referral if hyperpurulent and hyperacute (GC can rapidly invade and perforate cornea)

Bacterial Conjunctivitis



Chlamydial Conjunctivitis

- Ocular inoculation from genital infection with *Chlamydia trachomatis*
- Symptoms
  - Acute or subacute
  - Irritation
  - Tearing
  - Photosensitivity
- Signs
  - Usually unilateral
  - Diffuse follicular conjunctival reaction
  - Scant mucopurulent discharge
  - Preauricular adenopathy

Chlamydial Conjunctivitis

- Workup
  - Giemsa stain of conjunctival scraping for basophilic inclusion bodies
  - Direct fluorescent antibody staining of conjunctival scrapings
- Treatment
  - Oral docycycline 100mg po bid x 3 weeks (or tetracycline or erythromycin) vs Azithromycin 1g po x 1
  - Topical erythromycin ointment 2-4 x/day
  - Treat sex partner

Allergic Conjunctivitis

- Seasonal, history of atopic disease, airborne allergens with type-I hypersensitivity reaction
- Symptoms
  - Itching
  - Tearing
  - Intermittent blurry vision
- Signs
  - Bilateral diffuse conjunctival injection
  - Watery to stringy mucoid discharge

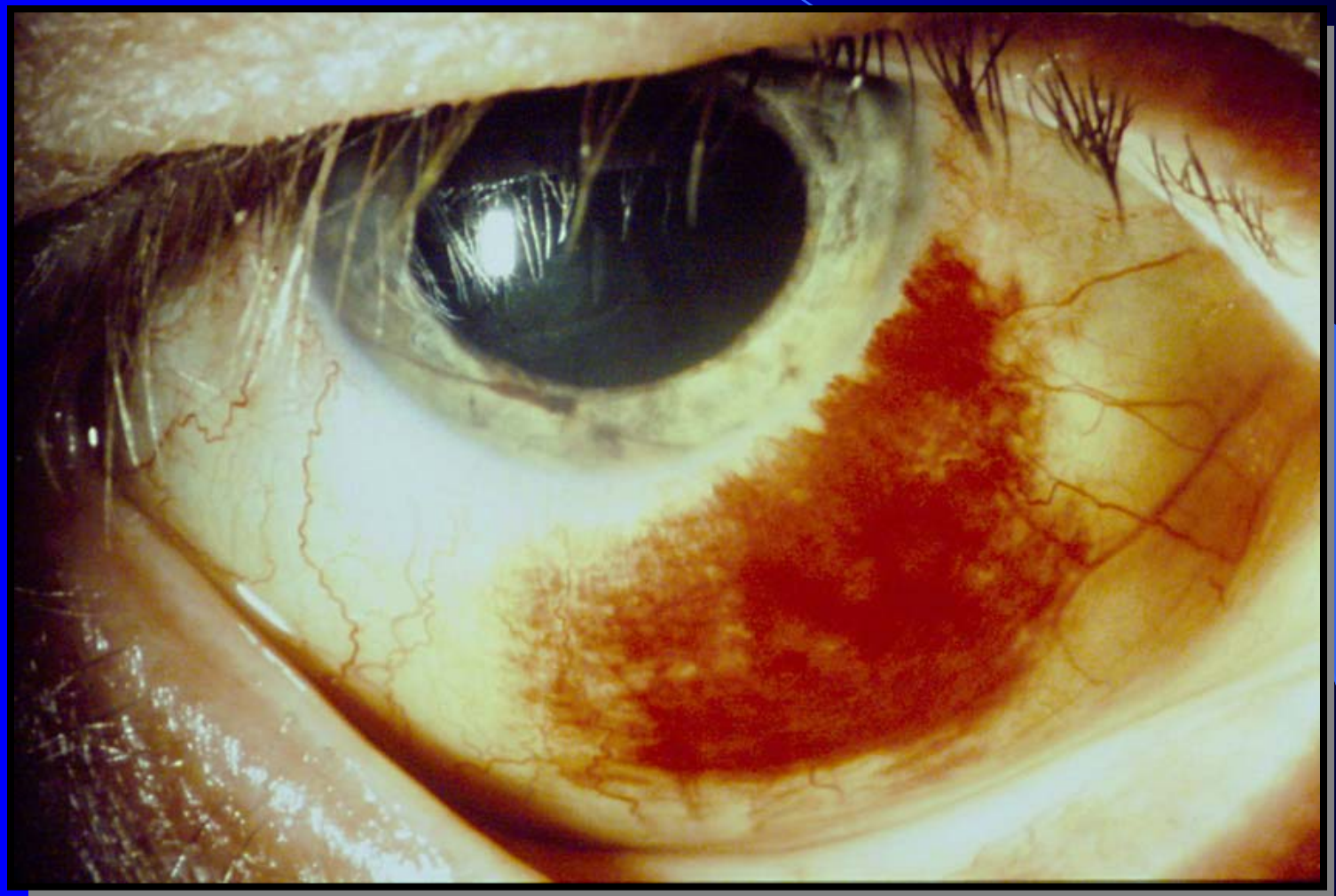
Allergic Conjunctivitis

- Treatment
  - Avoid allergens
  - Cool compresses
  - Artificial tears
  - Systemic and/or topical antihistamines (Vasocon-A, Naphcon-A)
  - Topical mast cell stabilizer (Patanol, Alomide, Crolom)
  - Topical NSAID (Acular, Voltaren)

Subconjunctival Hemorrhage

- Etiology
  - Trauma, surgery, eye-rubbing
  - Valsalva
  - Anticoagulants, coagulopathies
- Symptoms
  - Possible mild foreign body sensation
- Signs
  - Blood-red, well-circumscribed area overlying sclera
- Treatment
  - Reassurance
  - Cold compresses
  - Artificial tears

Subconjunctival Hemorrhage



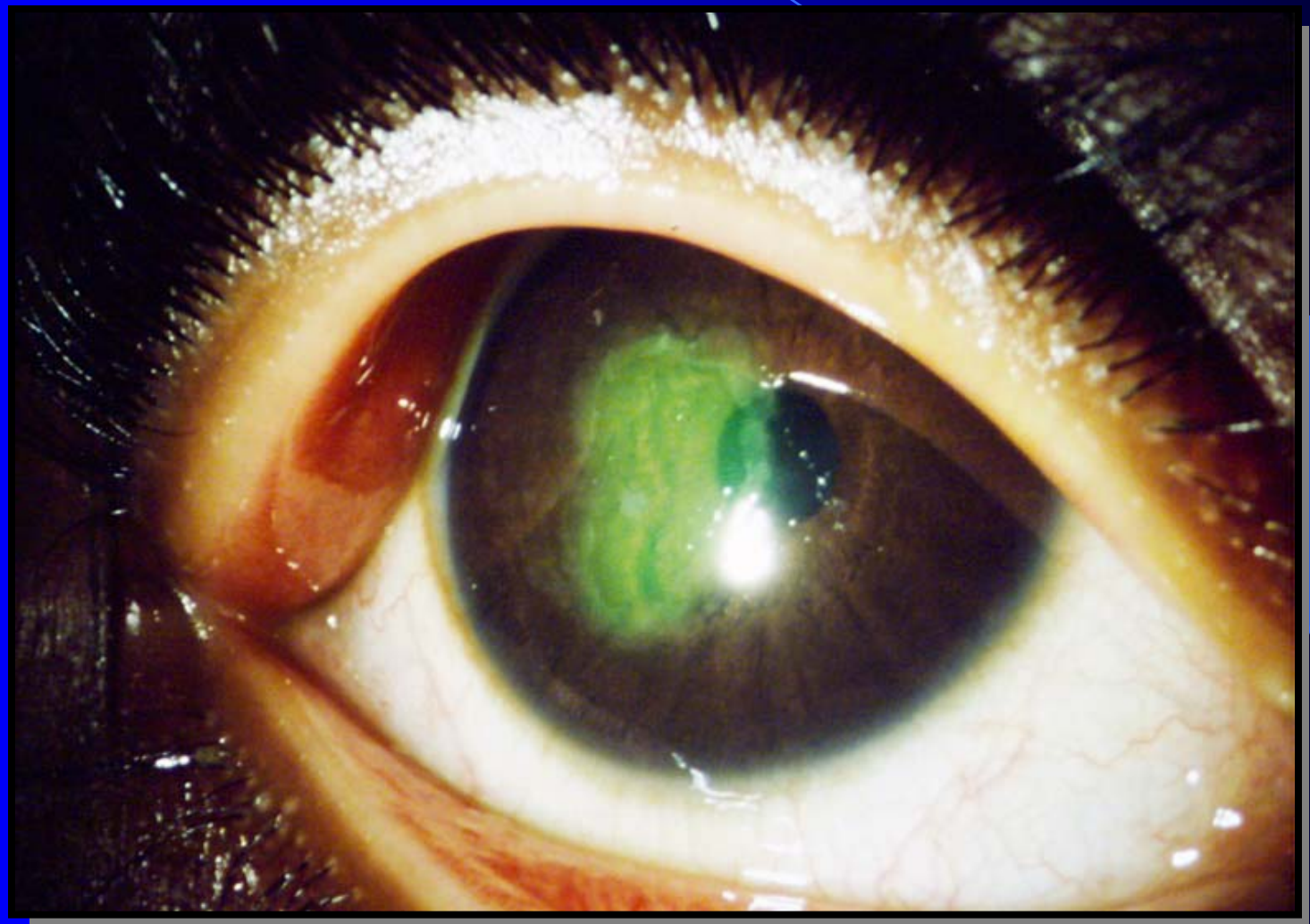
Corneal Abrasion

- Trauma
- Symptoms
  - Sudden onset severe pain
  - Foreign body sensation
  - Blurred vision
  - Tearing
  - Photosensitivity
- Signs
  - Diffuse conjunctival injection
  - Watery discharge
  - Staining epithelial defect
  - +/- Corneal edema/haze

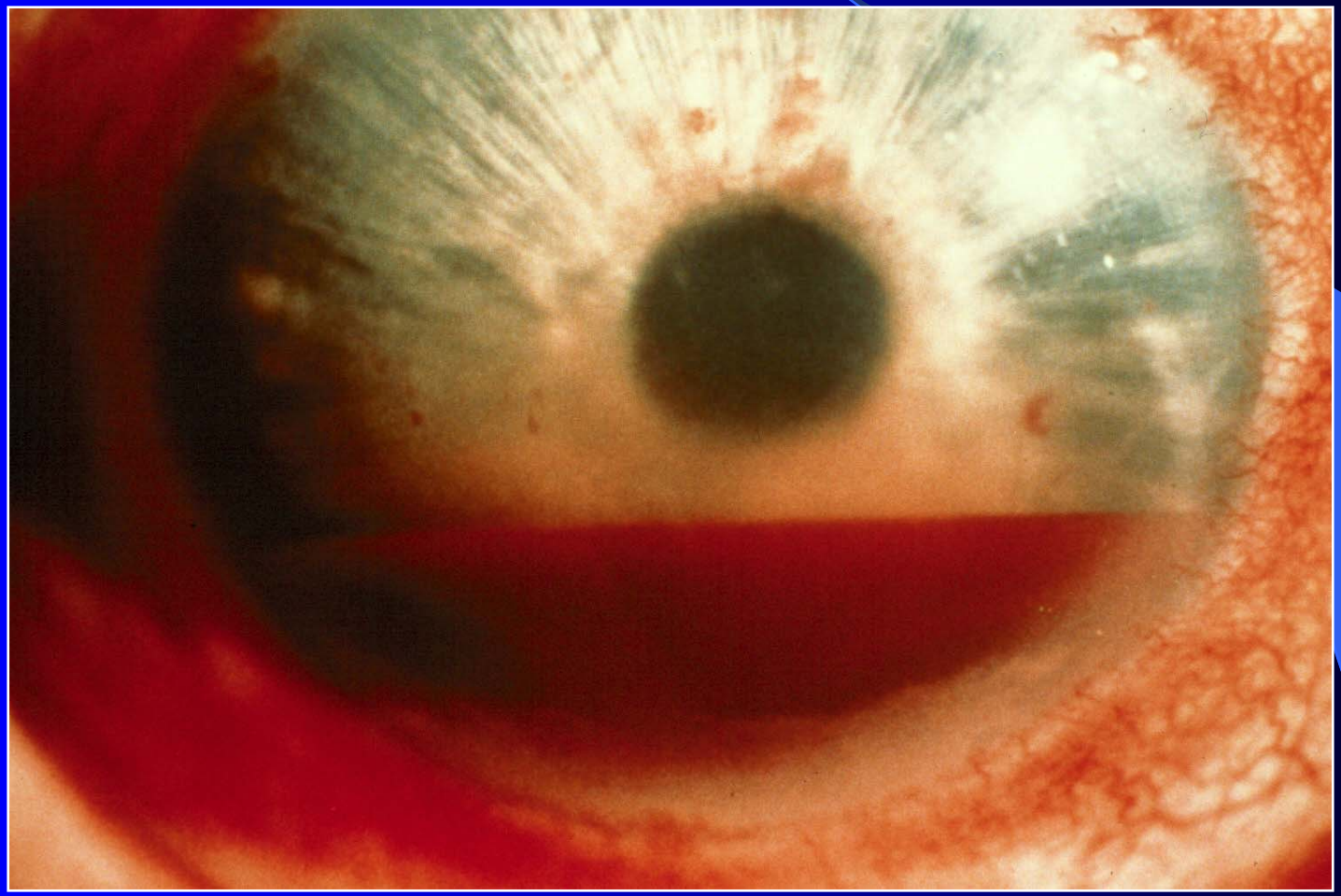
Corneal Abrasion

- Treatment
  - Artificial tears
  - Topical NSAID
  - Topical antibiotic drop or ointment (erythromycin ointment qid; NOT gentamicin!)
  - Ophthalmology referral if non-healing for 48 hours, or if contact lens-associated

Corneal Abrasion



Hyphema



Hyphema

- Blunt Trauma
- Layered blood inside the anterior chamber
- At high risk for re-bleeding and glaucoma
- May have nausea, photophobia, pain
- Sickle cell patients at particular risk
- Treat with strict bed rest, cyclopegia, topical steriods
- Needs ophthalmologist

Contact Lens Overwear

- Symptoms
  - Mild to moderate blurry vision
  - Tearing
  - Pain
- Signs
  - Watery to mucoid discharge
  - Diffuse or perilimbal conjunctival injection
  - Clear or hazy cornea
  - Variable corneal staining (punctate to epithelial defect)

Contact Lens Overwear

- Treatment
  - Discontinue contact lens wear
  - Topical NSAID
  - Topical antibiotic (NOT gentamicin!)
  - Ophthalmology or optometry referral
- It is NOT OK to sleep in contact lenses, unless specified by ophthalmologist

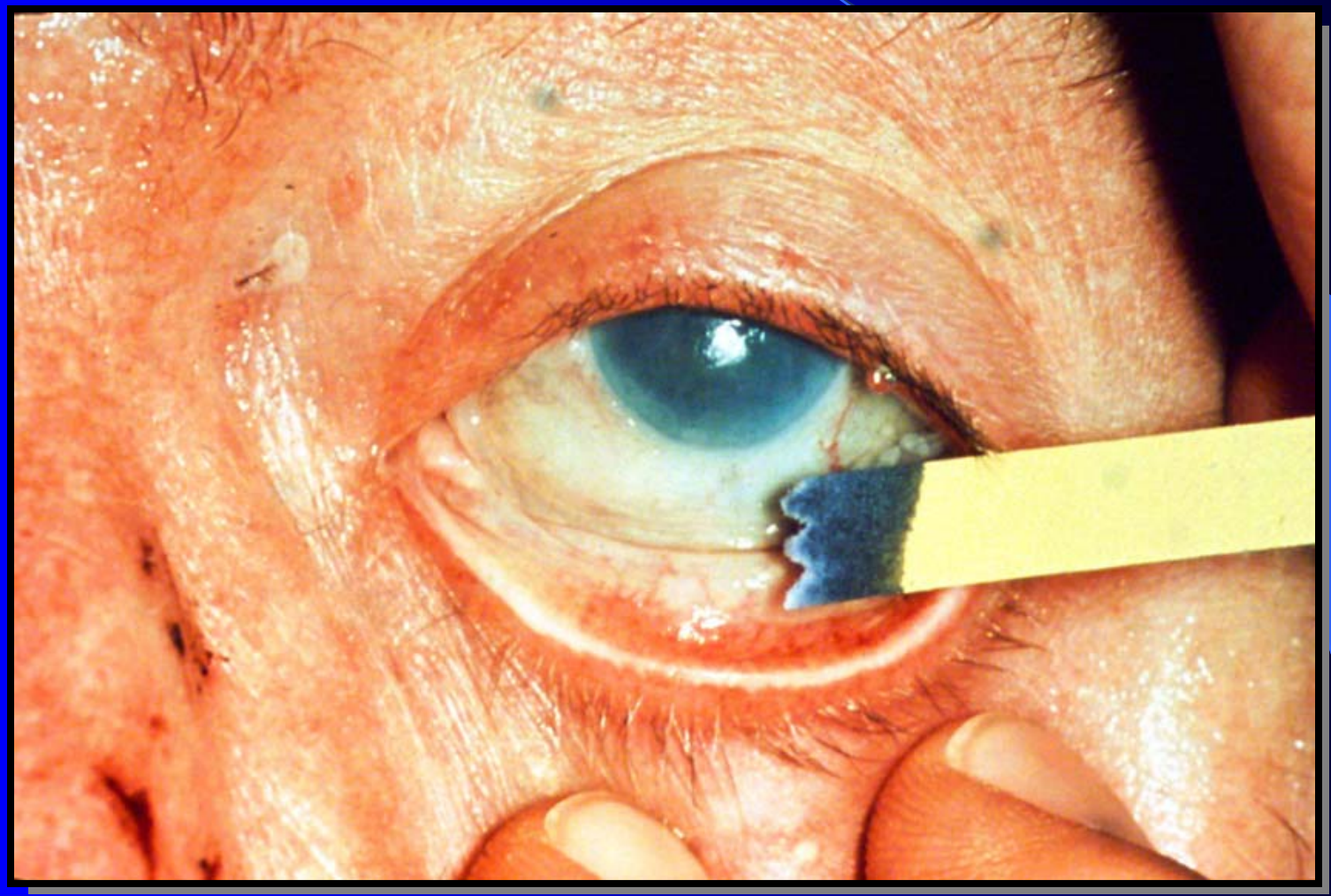
Corneal Foreign Body

- Evert upper lids
- Tetracaine or proparacaine for anesthesia
- Removal
  - Irrigation
  - Cotton swab
  - 20 gauge needle at slit-lamp for metallic foreign body
- Follow-up with Ophthalmology within 24 hours

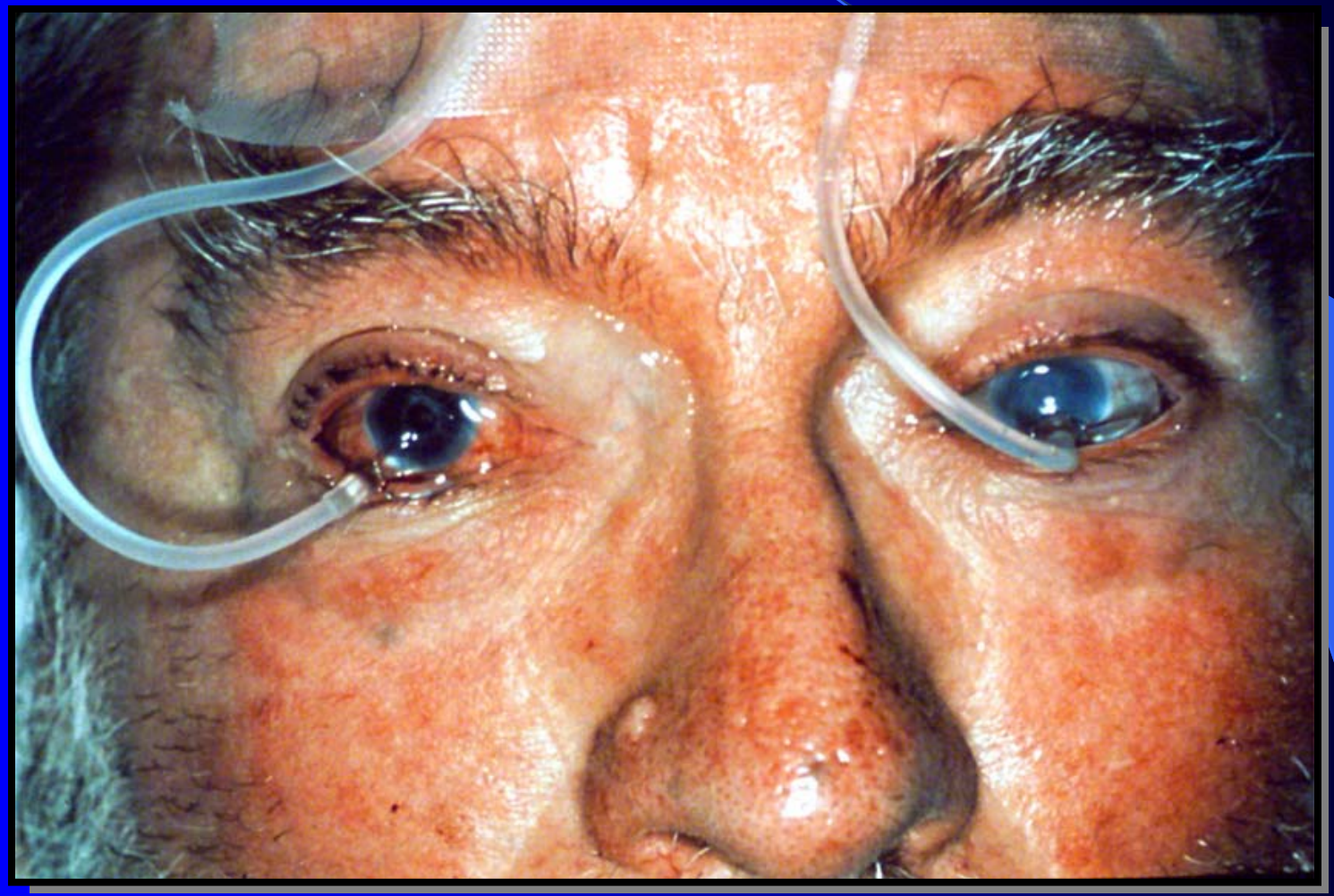
Chemical Injuries

- Use pH paper and flourescein to evaluate
- Immediately irrigate, irrigate, irrigate!!!
- Continue irrigation until pH = 7
- May require 5-10 liters of irrigation
- Erythromycin ointment qid (at least)
- Alkali (Drano, etc.) worst

Testing pH



Morgan Lens Irrigation



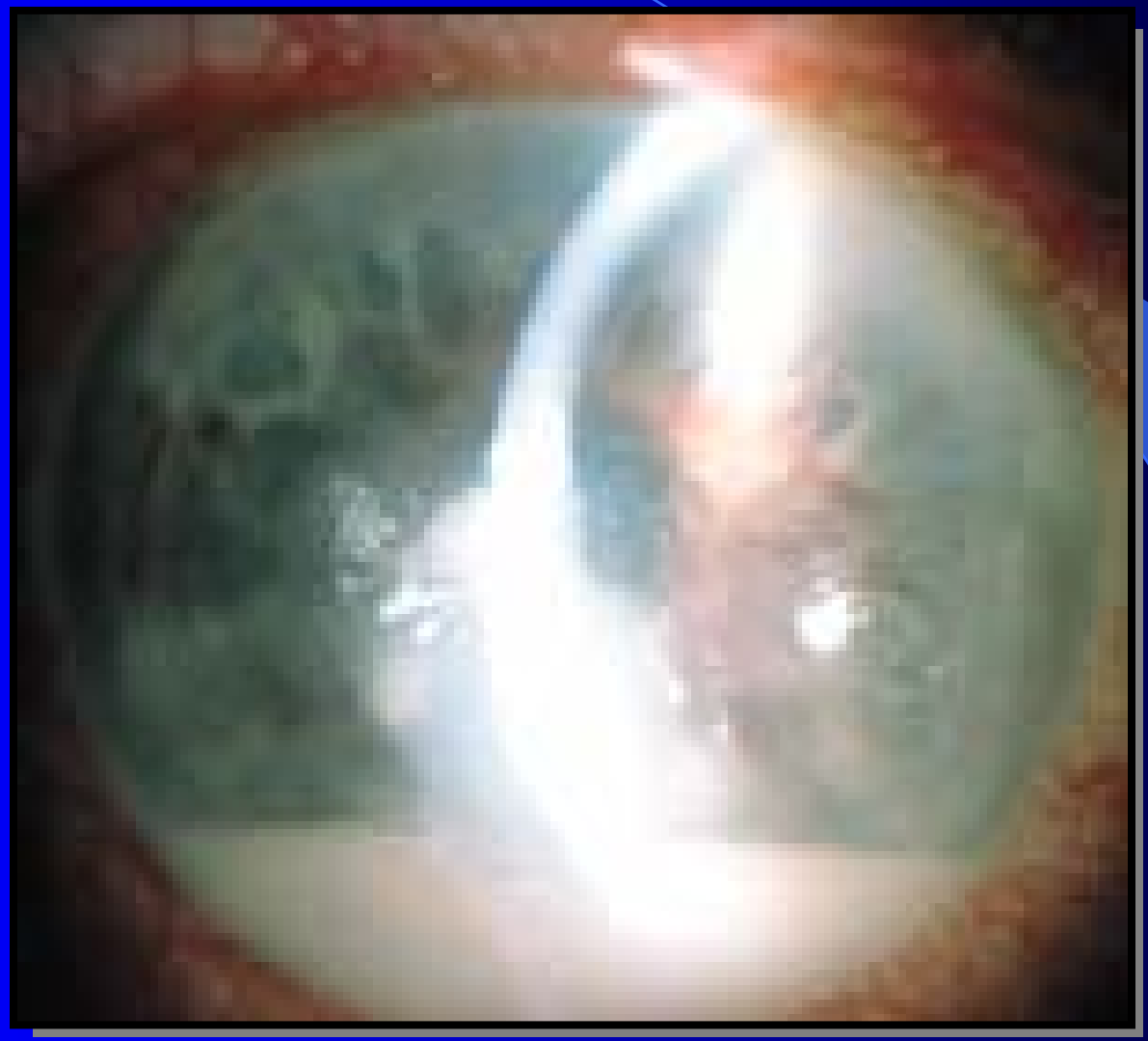
Corneal Ulcer

- History of trauma, foreign body, contact lens wear, corneal exposure
- Symptoms
  - Unilateral severe pain, decreased vision, photophobia, tearing
- Signs
  - Dense corneal infiltrate (opacity) with overlying epithelial defect; variable corneal thinning
  - Diffuse conjunctival injection
  - Mucopurulent discharge
  - Possible hypopyon
  - Small, sluggish pupil
  - Variable intraocular pressure

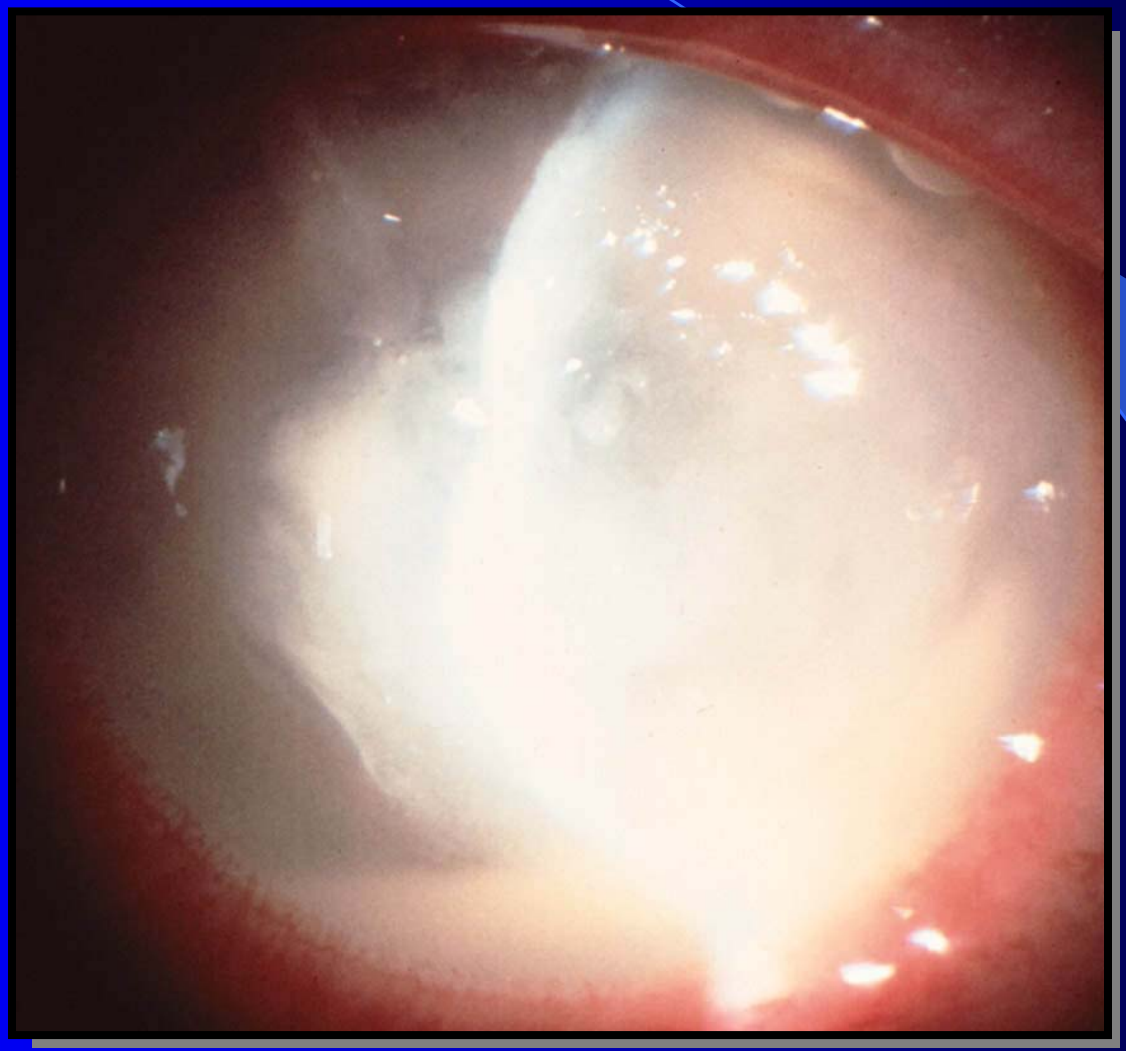
Corneal Ulcer

- Workup (by ophthalmologist)
  - Scrapings for Gram's stain
  - Cultures (bacterial, fungal, viral)
- Treatment
  - Immediate ophthalmology referral
  - Topical antibiotics

Corneal Ulcer



Corneal Ulcer



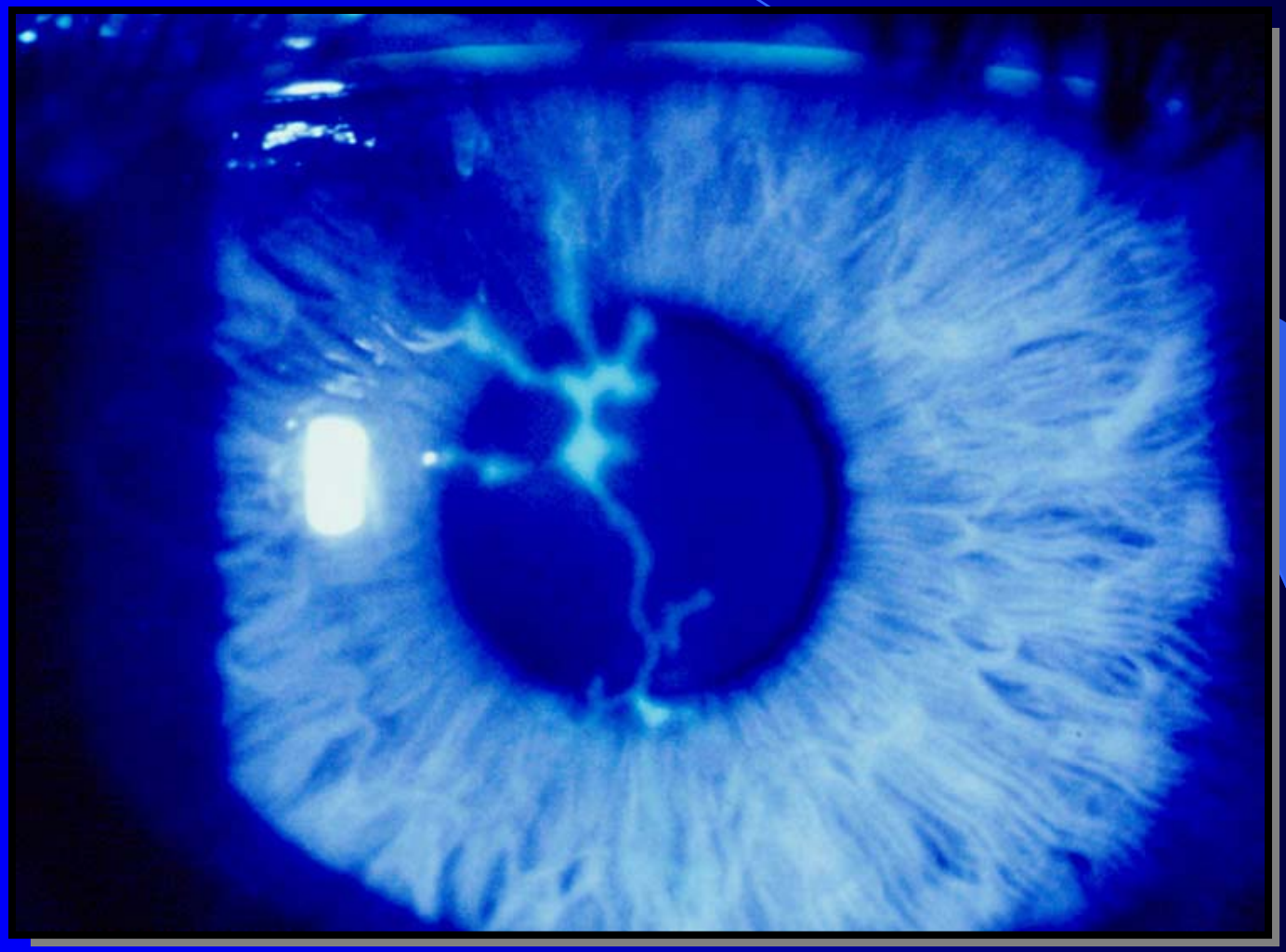
Herpes Simplex Keratitis

- Primary or latent HSV infection
- Symptoms
  - Primary: severe monocular pain, photophobia, tearing, blurred vision
  - Latent: asymptomatic to mild pain or foreign body sensation, photosensitivity, blurred vision
- Signs
  - Primary: vesicular blepharitis, follicular conjunctivitis, preauricular adenopathy, staining epithelial dendrite(s)
  - Latent: variable corneal involvement, from punctate keratitis to large geographic ulcer (staining), decreased corneal sensation

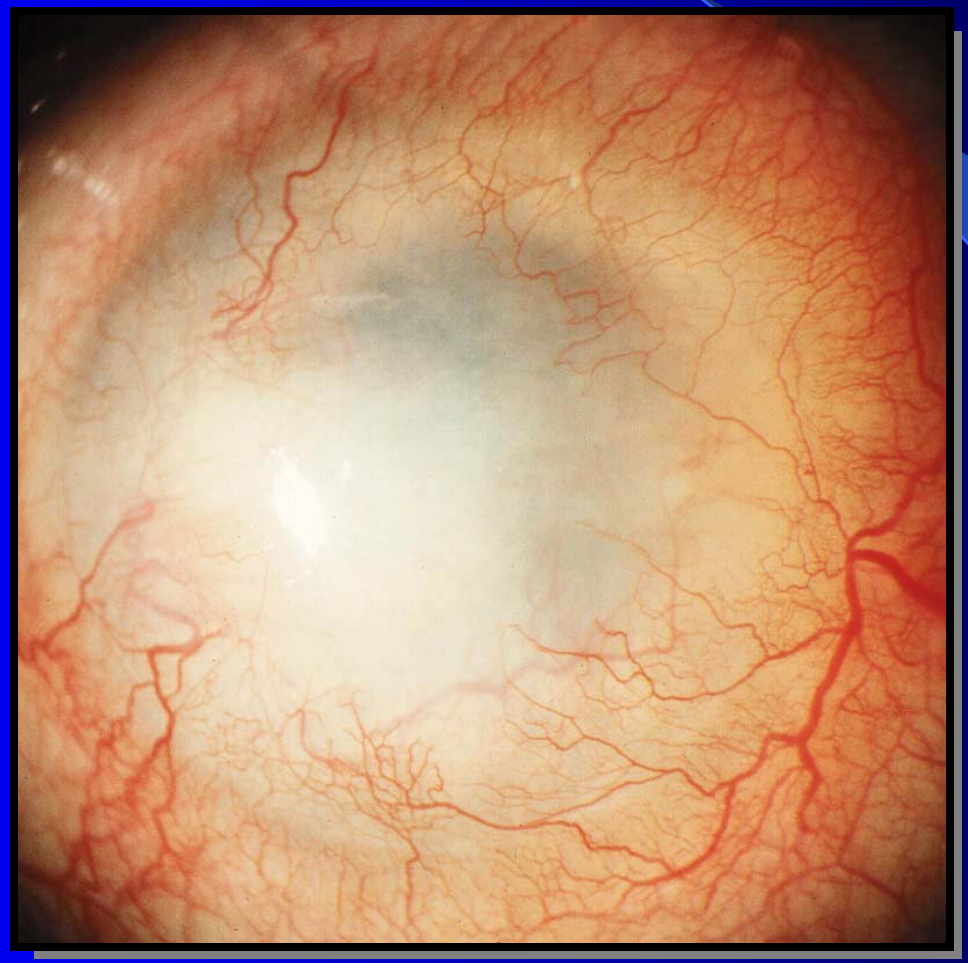
Herpes Simplex Keratitis

- Treatment
  - Urgent referral to ophthalmologist
  - Possible epithelial debridement
  - Topical trifluorothymidine (Viroptic) 9x/day or Vidarabine (Vira-A) ointment 5x/day
  - Cycloplegic agent
  - Erythromycin ointment to eyelid lesions bid
  - Possible topical or oral steroids
  - Oral antivirals (acyclovir, Valtrex) used often for prophylaxis in recurrent cases

Herpes Simplex Keratitis



Herpes Simplex Keratitis



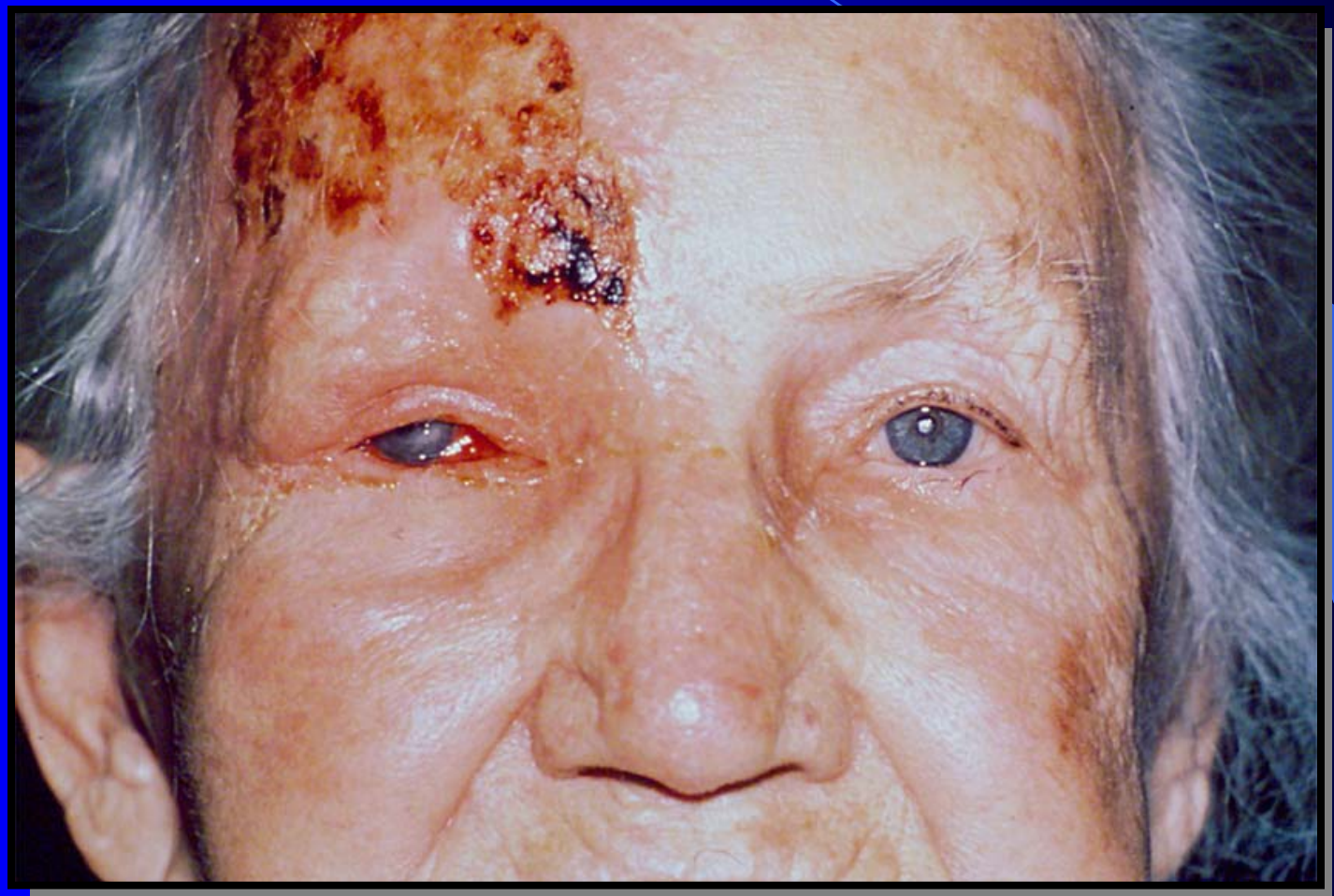
Herpes Zoster Ophthalmicus

- "Shingles"
- Symptoms
  - Monocular pain, unilateral headache, photophobia, decreased vision
- Signs
  - Vesicular skin rash in dermatome of 5th CN, obeys the midline, involves forehead/scalp/upper eyelid
  - Hutchinson's sign (rash in distribution of nasociliary branch of 1st division of CN V) predicts high risk of ocular involvement
  - Conjunctivitis, keratopathy, scleritis, uveitis, optic neuritis, retinitis, choroiditis, glaucoma, cranial nerve palsies, postherpetic neuralgia

Herpes Zoster Ophthalmicus

- Workup
  - Consider immunocompromised state if less than 40yo
  - Treatment
    - Oral antiviral (acyclovir 800mg 5x/d, famciclovir 500mg tid, valacyclovir 1,000mg tid for 7-10d)
    - If severe or patient very ill or immunocompromised, hospitalize and give acyclovir 5-10mg/kg IV q8h x 5-10d
    - Erythromycin ointment to skin lesions bid
    - Warm compresses to periocular skin tid
  - Ophthalmology referral within 24 hours
    - Possible topical steroid, cycloplegic, antibiotic ointment, IOP-lowering agent

Herpes Zoster Ophthalmicus



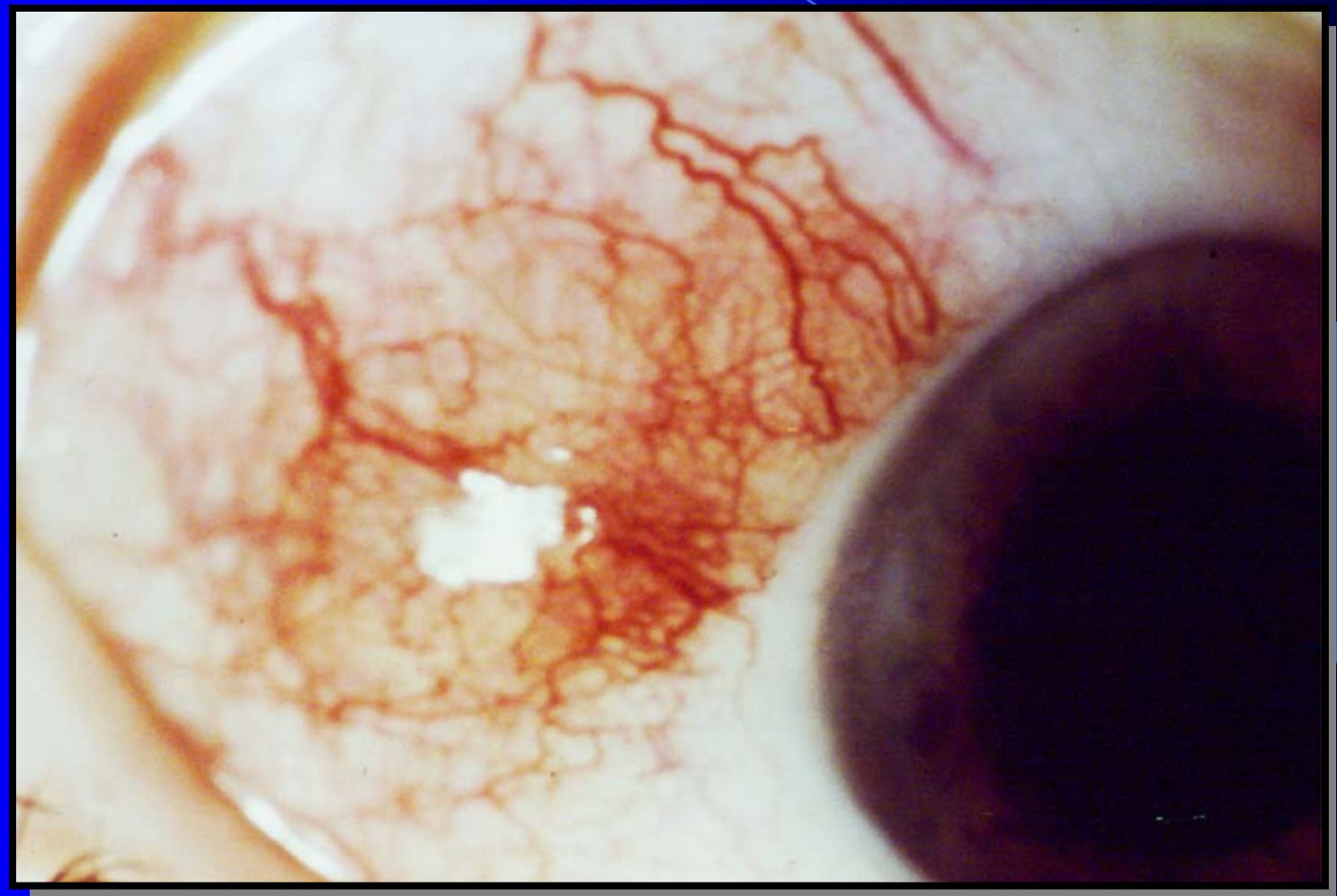
Episcleritis

- 75% idiopathic; young adults
- Others: collagen vascular disease, rosacea, gout, HZV, IBD, thyroid disease, atopy, syphilis
- Symptoms
  - Painless or acute onset of dull ache
  - Normal visual acuity or mild blurring
  - Recurrent episodes
- Signs
  - Sectoral or diffuse redness of one or both eyes
  - Engorged episcleral vessels
  - No discharge or corneal involvement

Episcleritis

- Workup
  - Phenylephrine (2.5%) test: blanching of episcleral vessels
- Treatment
  - Usually self-limited
  - Cool compress
  - Artificial tears
  - Topical NSAID, vasoconstrictor
  - Topical steroid (by Ophthalmologist only)
  - Oral NSAID

Episcleritis



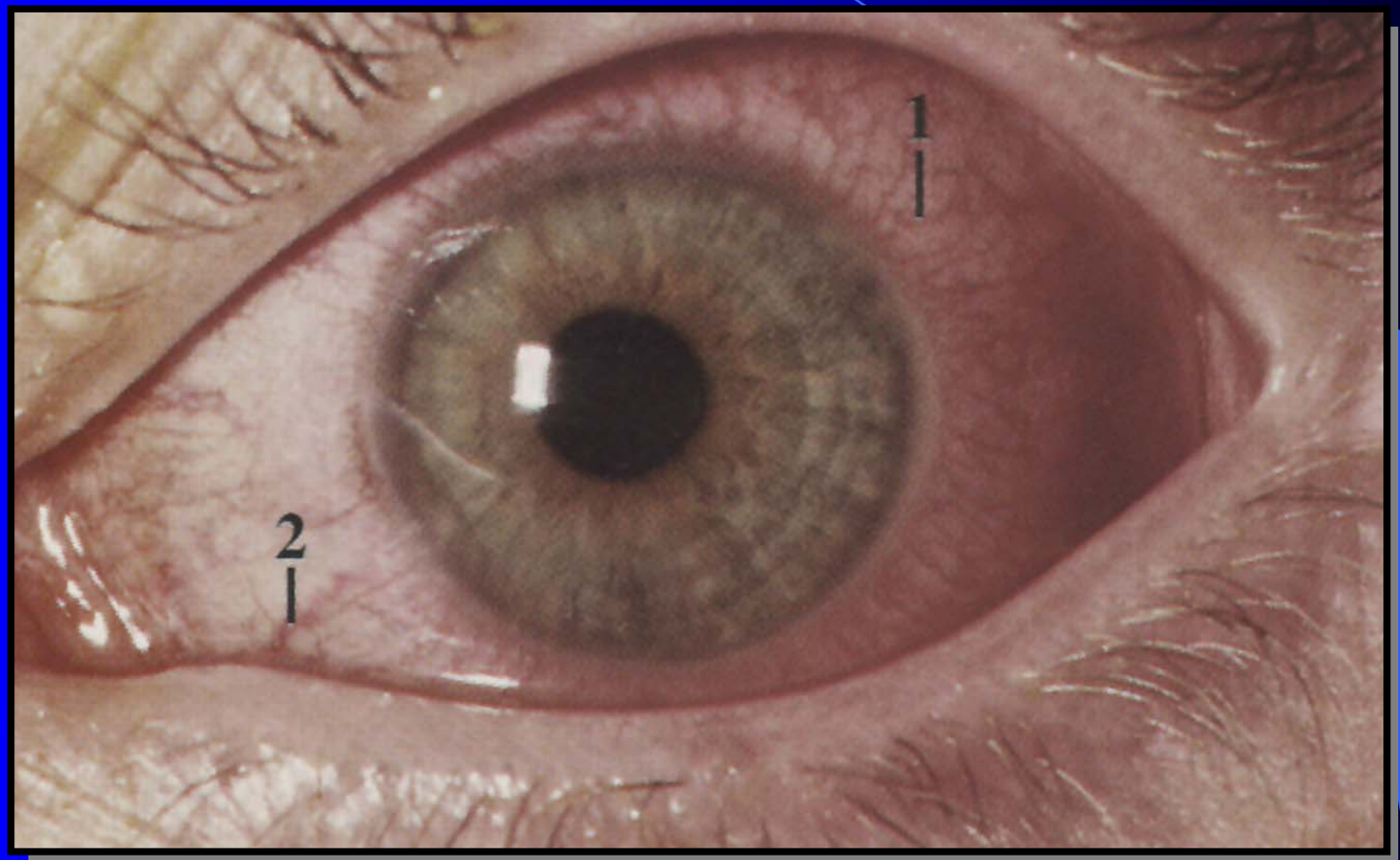
Scleritis

- 50% idiopathic
- 50% with systemic disease (RA, SLE, polyarteritis nodosa, Wegener's, relapsing polychondritis, ankylosing spondylitis, GCA, gout, TB, HZV, syphilis)
- Symptoms
  - Gradual onset, severe pain, photophobia, tearing, normal or mild blurry vision, recurrent
- Signs
  - Tender globe to palpation
  - Sectoral or diffuse scleral erythema, thinning with bluish hue, edema, possible nodules or necrosis
  - Possible corneal and intraocular inflammation

Scleritis

- Workup
  - 2.5% phenylephrine test: deep episcleral and scleral vessels do not blanch
  - Scleral vessels cannot be moved with a cotton swab
- Treatment
  - Systemic evaluation by PCP or rheumatologist
  - Ophthalmology referral
  - Oral NSAID or corticosteroid
  - Topicals usually not effective
  - Possible cytotoxic agents

Scleritis



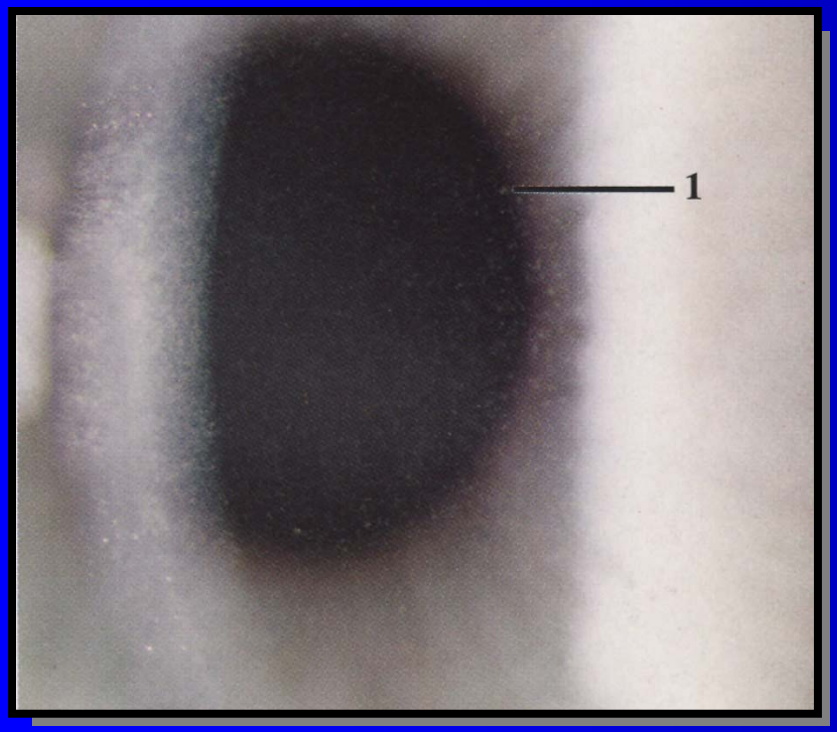
Iritis (Anterior Uveitis)

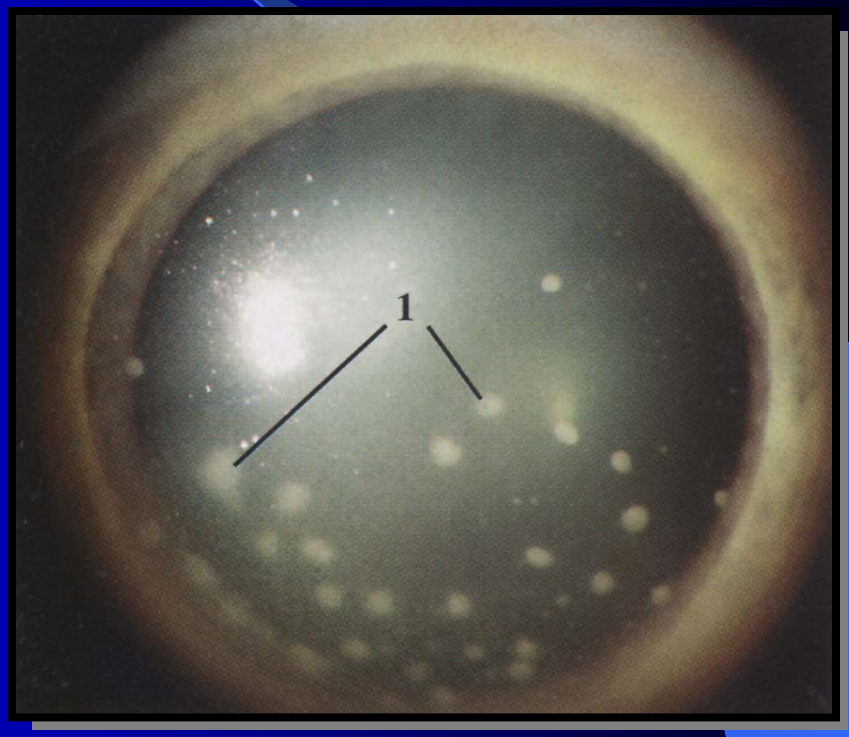
- Idiopathic, traumatic, autoimmune, infectious, post-operative, malignancy
- Symptoms
  - Unilateral or bilateral
  - Pain, photophobia, tearing
  - Normal to mildly decreased vision
- Signs
  - Perilimbal flush
  - Watery discharge
  - Possible constricted and sluggish pupil
  - Variable intraocular pressure

Iritis (Anterior Uveitis)

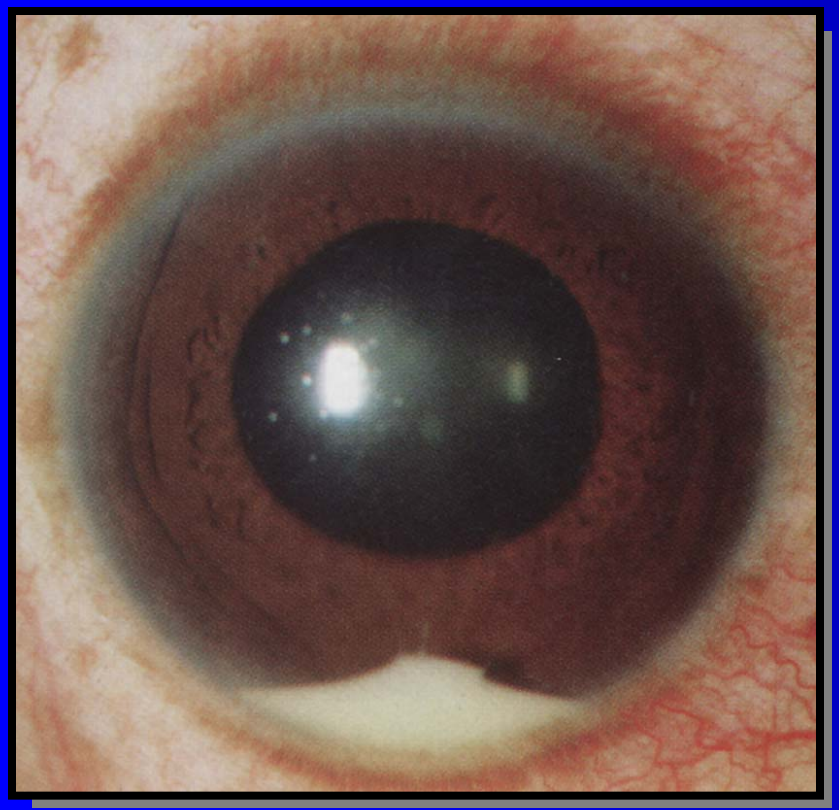
- Slit lamp exam
  - Deposits on posterior surface of cornea (keratic precipitates)
  - Inflammatory cells and protein (flare) in AC
  - Adhesions of iris to surface of lens (posterior synechiae)
- Workup
  - Complete ocular history and exam
  - Systemic history and exam for various associated conditions
- Treatment by Ophthalmologist
  - Topical/oral steroids
  - Cycloplegic agent

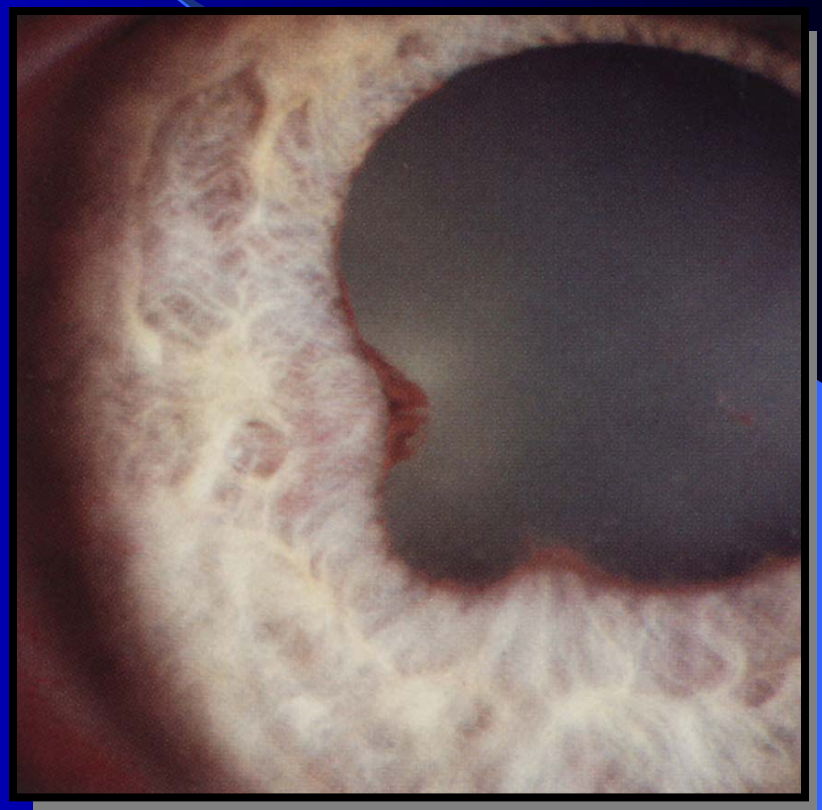
Iritis (Anterior Uveitis)





Iritis (Anterior Uveitis)





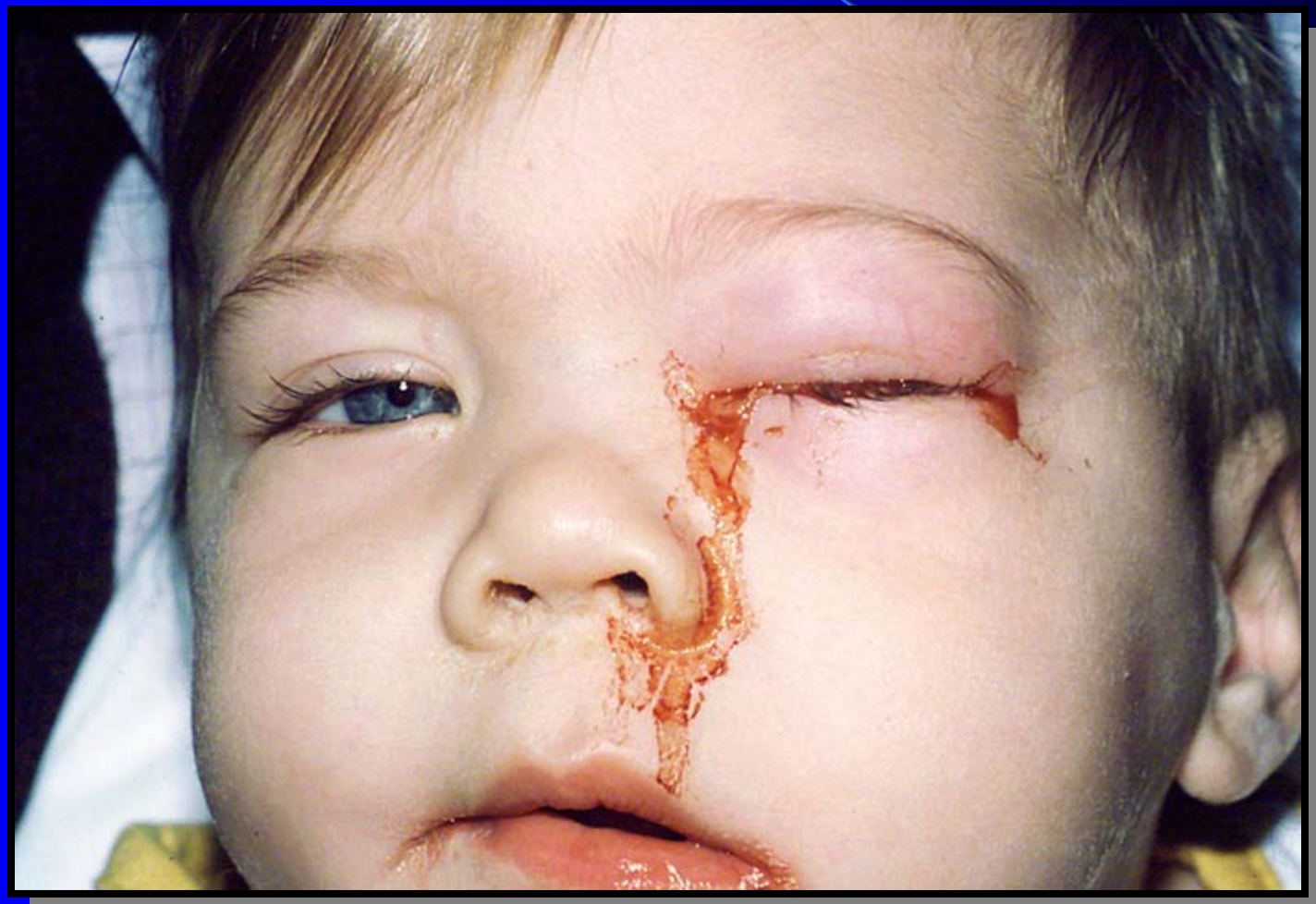
Preseptal and Orbital Cellulitis

- Direct extension from focal eyelid/orbital infection
- Direct extension from sinus infection
- Complication of orbital trauma
- Complication of orbital or sinus surgery
- Vascular extension (bacteremia or facial cellulitis)

Preseptal and Orbital Cellulitis

- Both present with redness and erythematous, edematous, warm, tender periorbita
- Orbital cellulitis
  - Symptoms: blurred vision, diplopia, pain on attempted eye movement, headache
  - Signs: above plus fever, conjunctival chemosis and injection, proptosis, restricted ocular motility
  - Often CT scan is only way to distinguish in a child
  - Requires IV antibiotics (Unasyn)
  - Low threshold for surgical drainage of abscess

Preseptal and Orbital Cellulitis



Acute Angle Closure Glaucoma

- Rare
- Pupillary block
  - Anatomically predisposed eyes with narrow anterior chamber angles (hyperopic)
  - Precipitated by topical mydriatics, systemic anticholinergics or sympathomimetics, accommodation, or dim illumination
  - Women > men by 3-4x
  - Peak age 55-70 years

Acute Angle Closure Glaucoma

- Symptoms
  - Unilateral blurred vision
  - Halos around lights (monocular)
  - Intense pain and photophobia, frontal headache
  - Vasovagal symptoms (diaphoresis, N/V)
- Signs
  - Fixed, middilated pupil
  - Diffuse conjunctival injection
  - Corneal edema with blurring of light reflex
  - Shallow anterior chamber bilaterally
  - Markedly elevated IOP, often 60-80mmHg (“rock hard”)

Acute Angle Closure Glaucoma

- Treatment
  - Emergent referral to Ophthalmology
  - For vision of hand motion or worse
    - All topical glaucoma agents, if not contraindicated
    - IV Diamox
    - IV osmotics (mannitol)
  - For IOP<50 and less severe loss of vision
    - Topical glaucoma agents
    - Topical steroids
  - Once IOP decreased significantly and angle is open, definitive treatment is laser (or surgical) peripheral iridotomy to both eyes

Acute Angle Closure Glaucoma

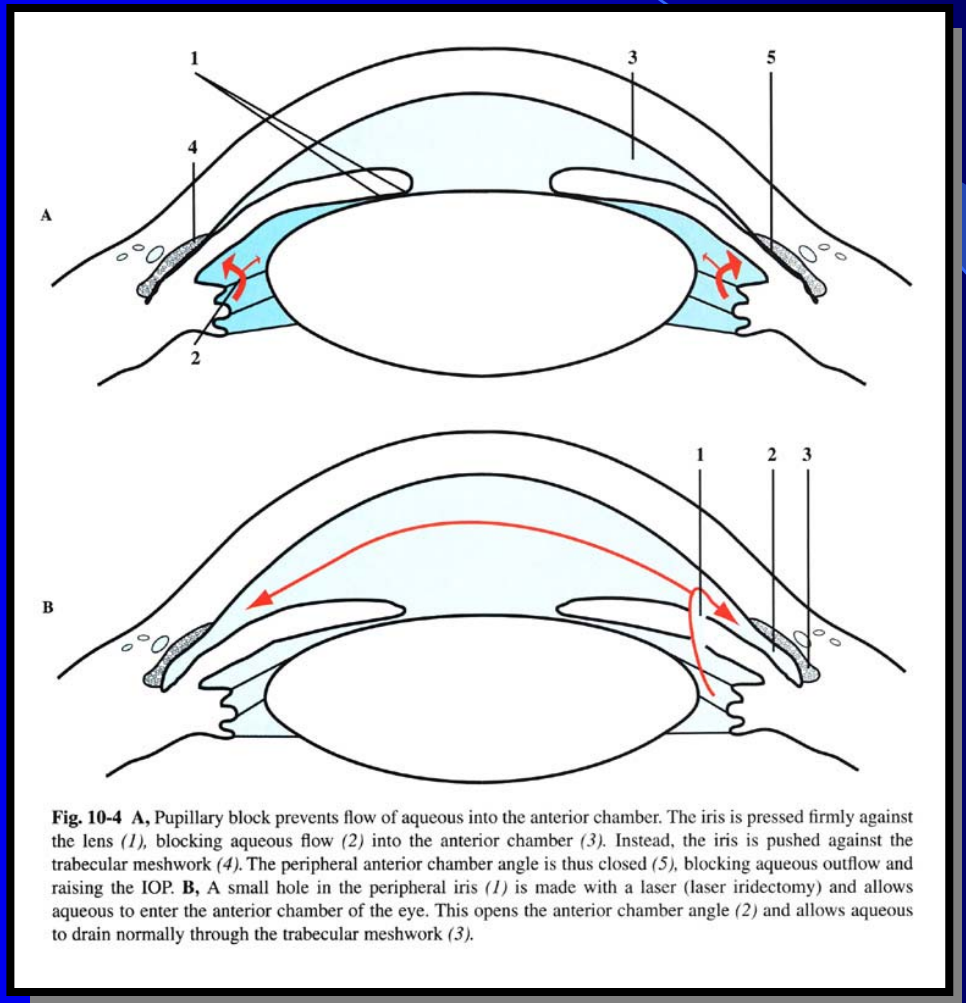


Fig. 10-4 A, Pupillary block prevents flow of aqueous into the anterior chamber. The iris is pressed firmly against the lens *(1)*, blocking aqueous flow *(2)* into the anterior chamber *(3)*. Instead, the iris is pushed against the trabecular meshwork *(4)*. The peripheral anterior chamber angle is thus closed *(5)*, blocking aqueous outflow and raising the IOP. **B,** A small hole in the peripheral iris *(1)* is made with a laser (laser iridectomy) and allows aqueous to enter the anterior chamber of the eye. This opens the anterior chamber angle *(2)* and allows aqueous to drain normally through the trabecular meshwork *(3)*.

Acute Angle Closure Glaucoma