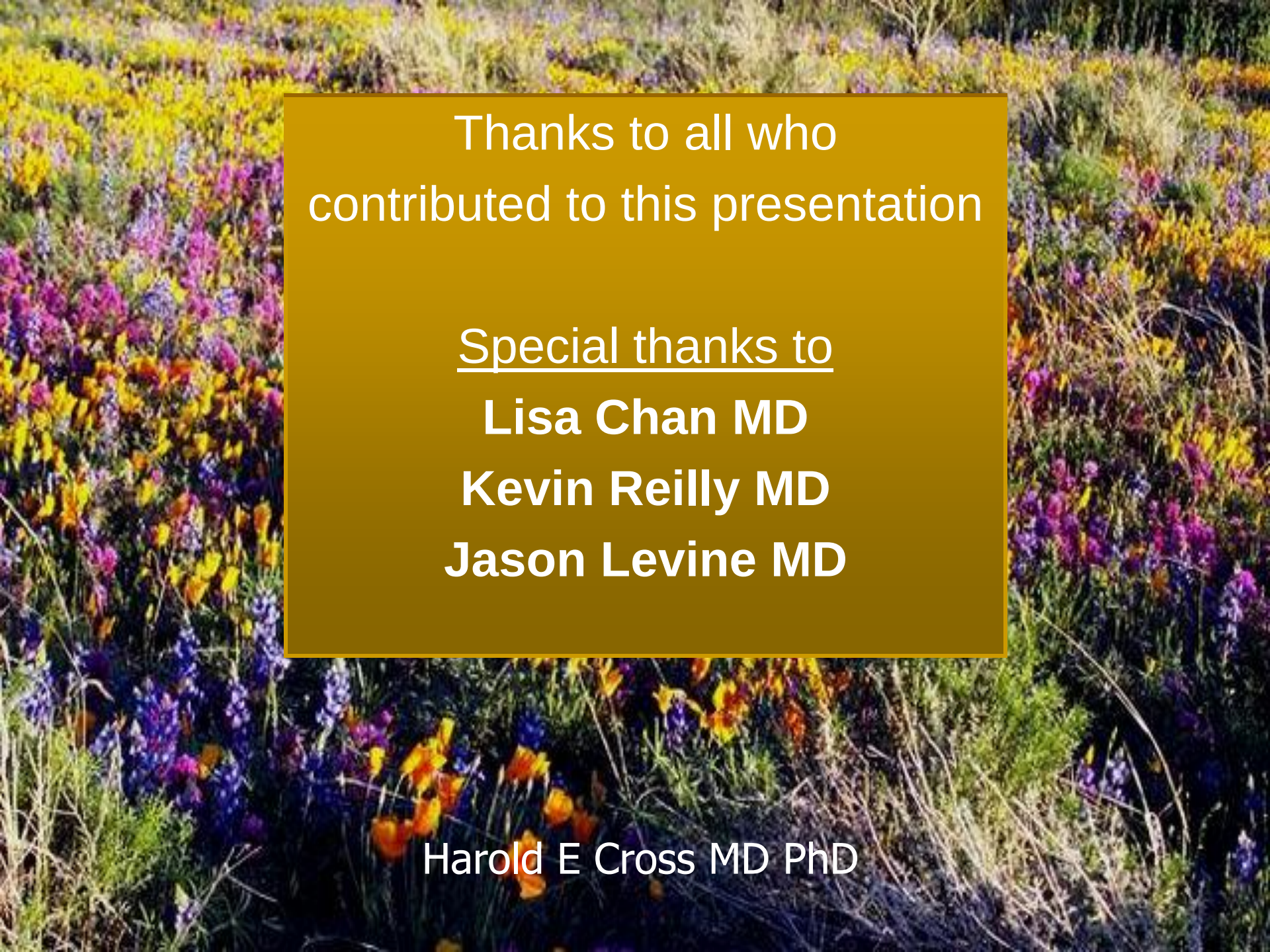
RED EYE AND OCULAR TRAUMA

v. 5.0
October 6, 2009


Thanks to all who
contributed to this presentation
Special thanks to
Lisa Chan MD
Kevin Reilly MD
Jason Levine MD
Harold E Cross MD PhD

RED EYE
(NON-VISION-THREATENING DISORDERS)

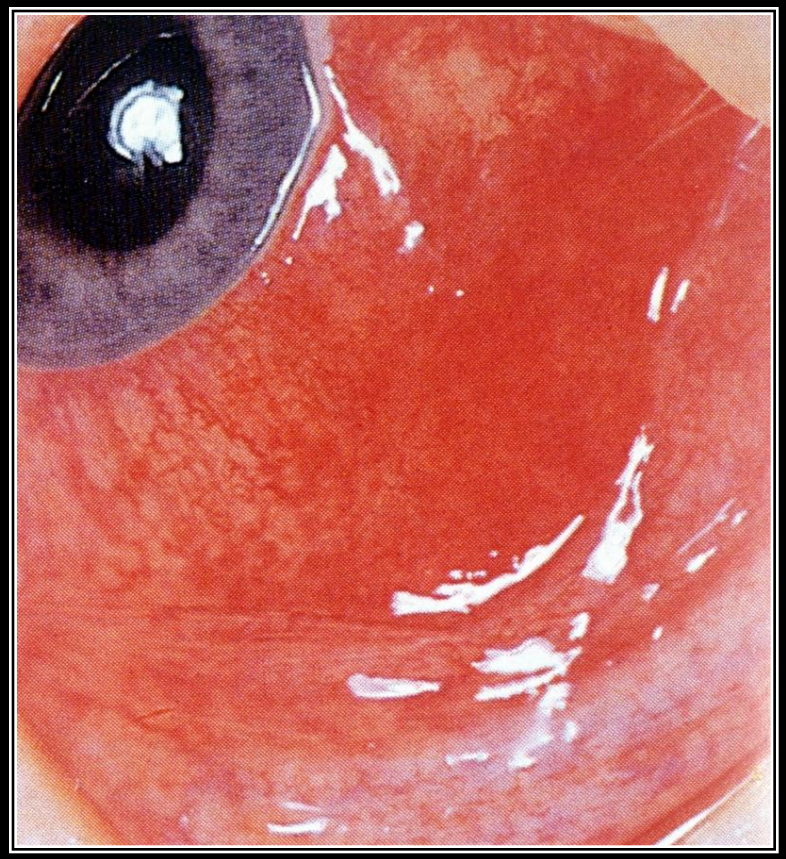
- Subconjunctival hemorrhage
- Conjunctivitis
- Blepharitis
- Keratitis
- Dry eye
- Pterygium/pingueculum

RED EYE
(VISION-THREATENING DISORDERS)

- Iritis/uveitis
- Corneal ulcers
- Angle-closure glaucoma
- Preseptal/orbital cellulitis
- Endophthalmitis
- Trauma

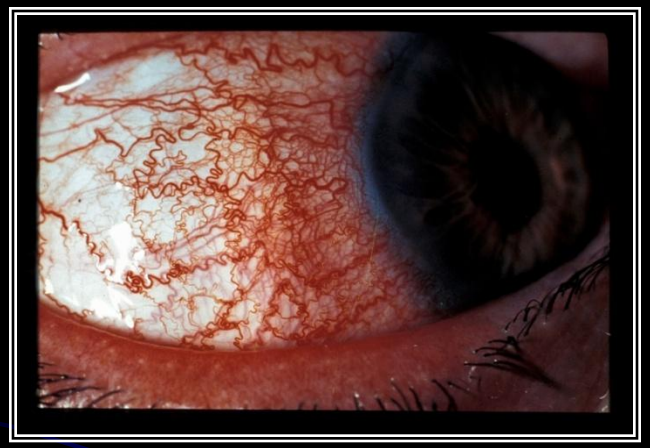
External examination

Subconjunctival hemorrhage



Conjunctival injection

External examination



Conjunctival injection

RED EYE
(NON-VISION-THREATENING DISORDERS)

- Subconjunctival hemorrhage

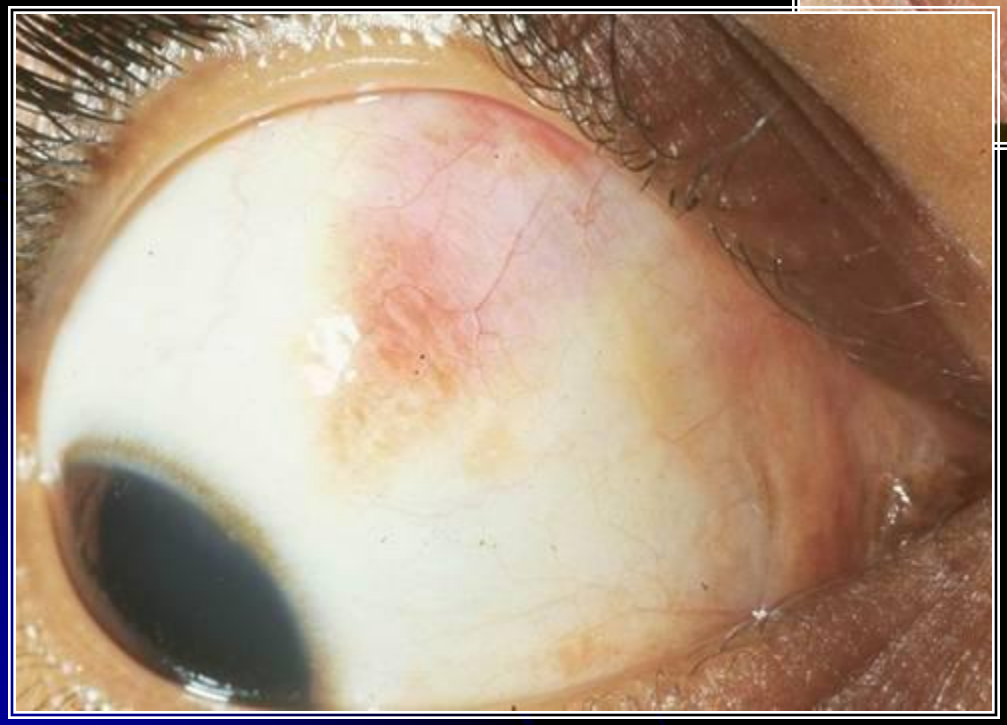
RED EYE

(NON-VISION-THREATENING DISORDERS)

Subconjuntival hemorrhage with chemosis

Keep conjunctiva moist with antibiotic ointment

Posterior petechial hemorrhages



Think embolic disease

Subconjunctival air!

RED EYE
(NON-VISION-THREATENING DISORDERS)

- Conjunctivitis: **NOT**

RED EYE
(NON-VISION-THREATENING DISORDERS)

- Conjunctivitis
  - allergic

Allergic to Polytrim

RED EYE
(NON-VISION-THREATENING DISORDERS)

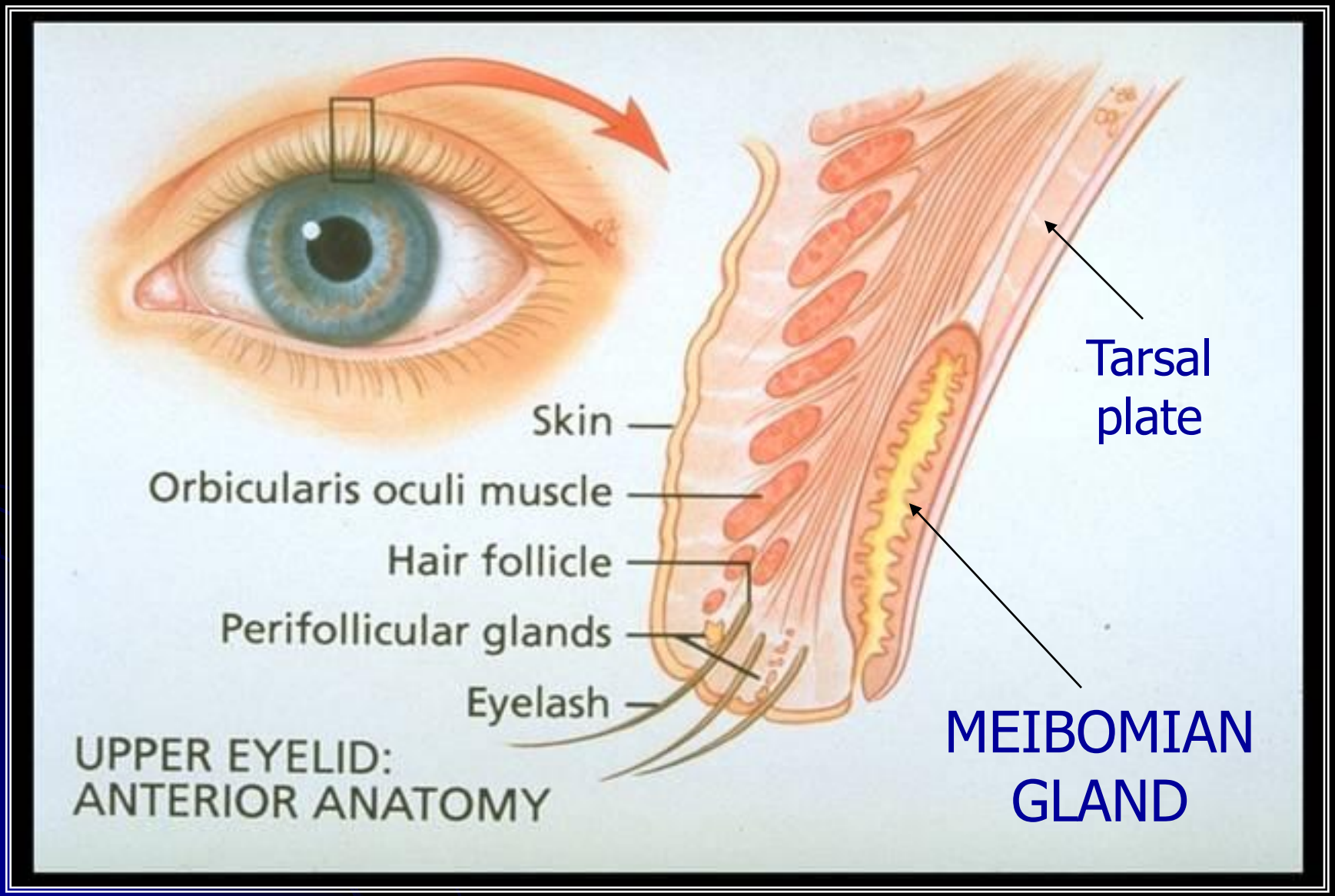
- Conjunctivitis
  - bacterial

RED EYE
(NON-VISION THREATENING DISORDERS)

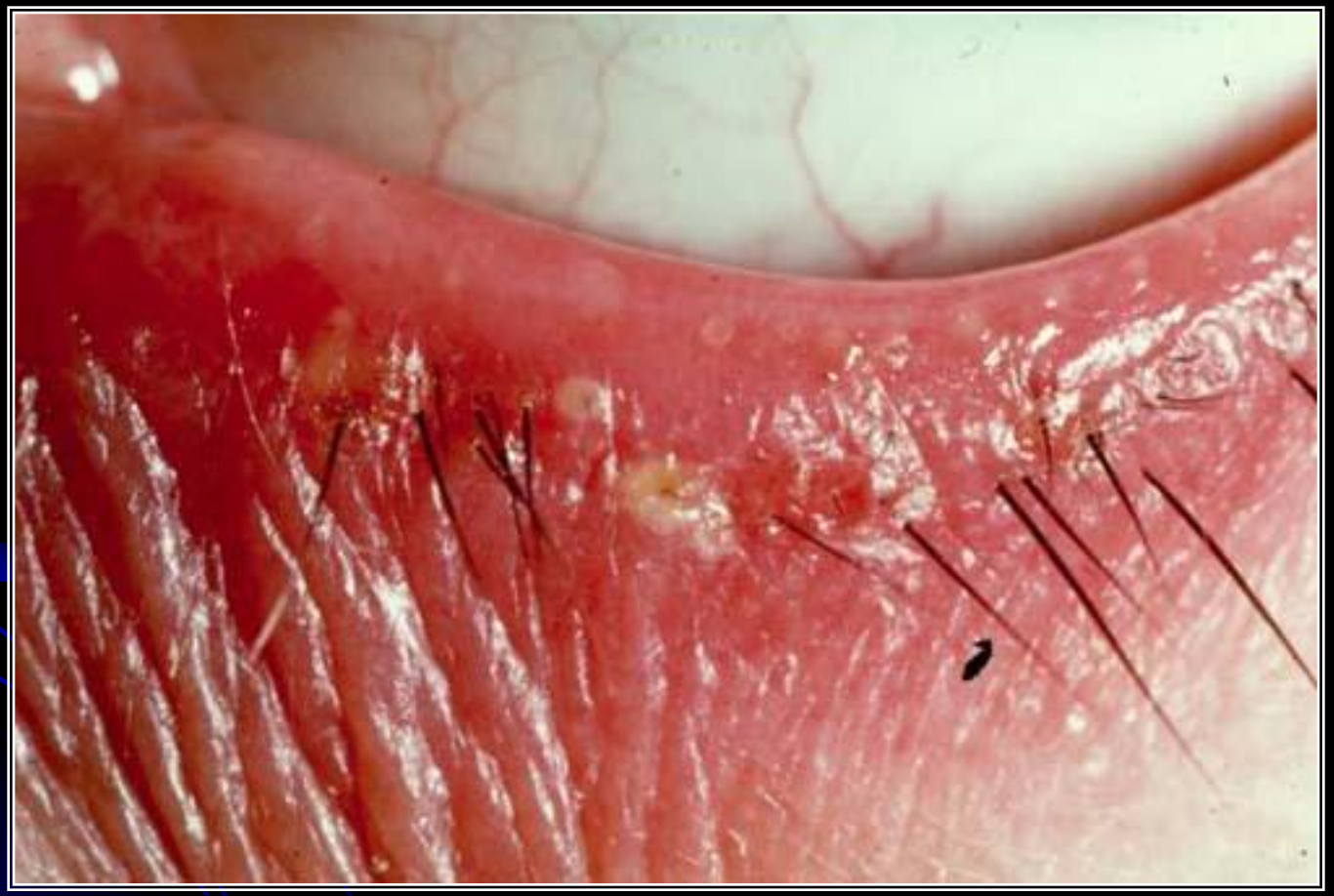
- Conjunctivitis
  - chemical

Proparacaine abuse

EYELID ANATOMY



Meibomianitis



RED EYE
(NON-VISION-THREATENING DISORDERS

- Blepharitis

Acute

BLEPHARITIS

Subacute

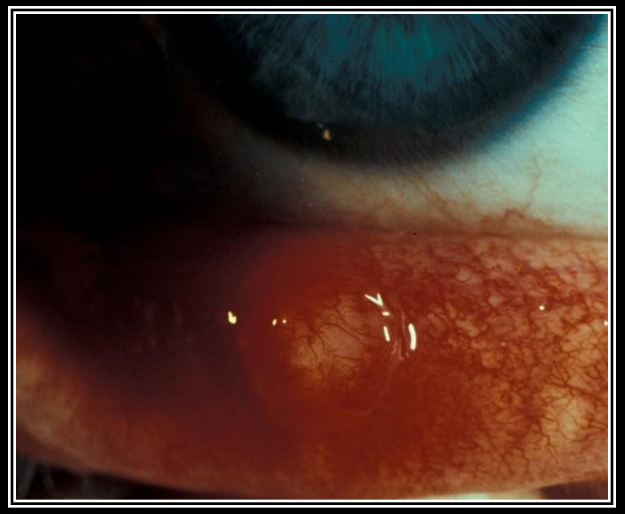
Chronic

External hordeolum

Internal hordeolum

Chalazion

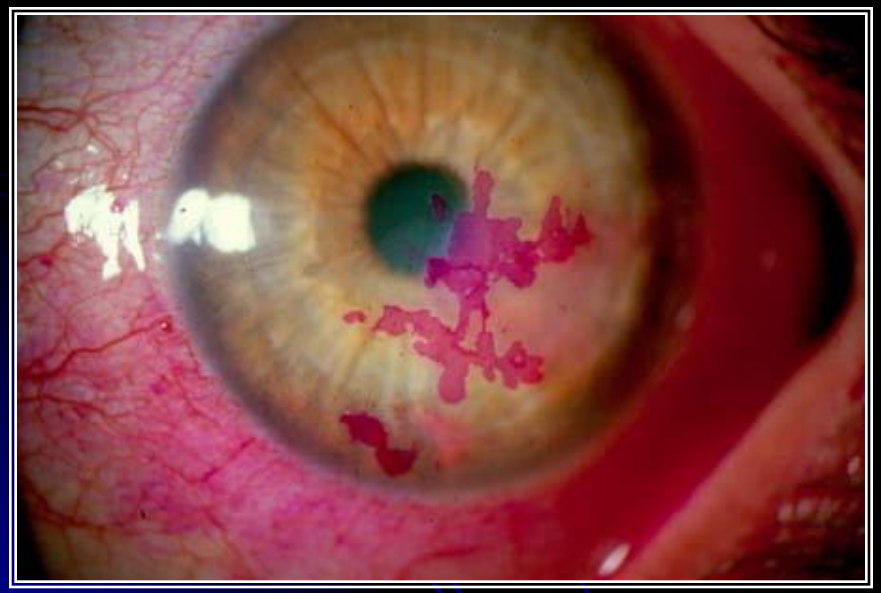
Chalazia



Blepharo-conjunctivitis

RED EYE
(NON-VISION-THREATENING DISORDERS)

- Keratitis: dendritic

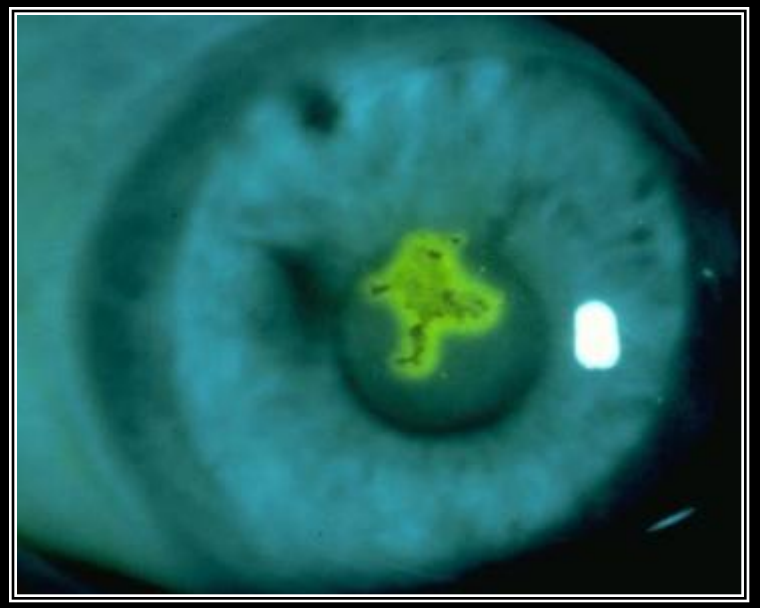


RED EYE
(NON-VISION-THREATENING DISORDERS

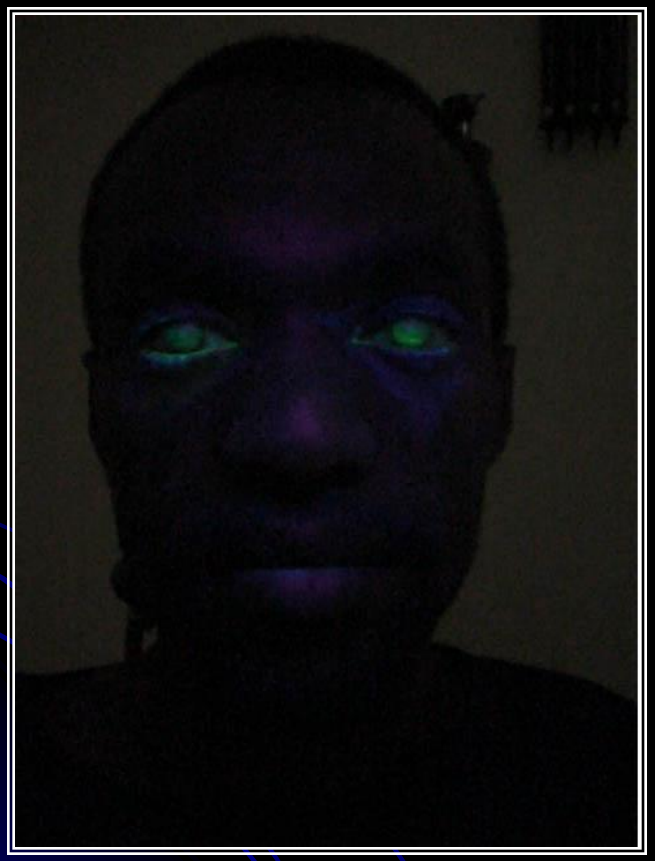
- Keratitis
  - viral

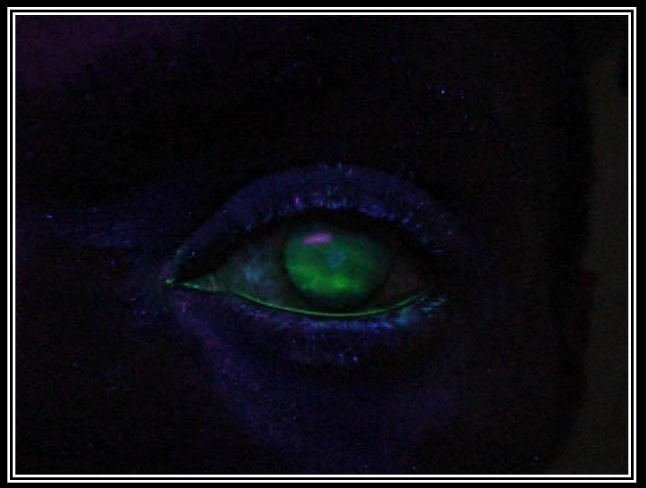
HSV-1

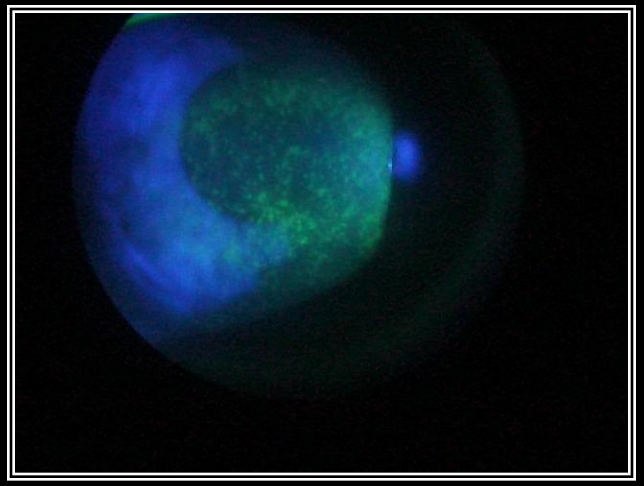
H. zoster



The cornea







Ultraviolet keratitis

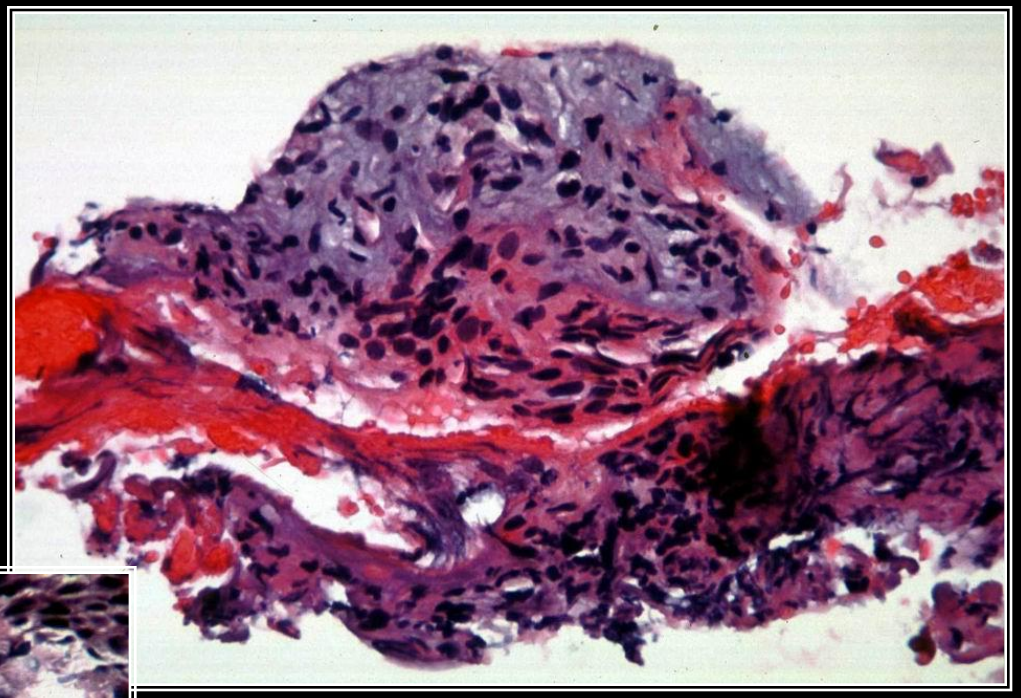
RED EYE
(NON-VISION-THREATENING DISORDERS)

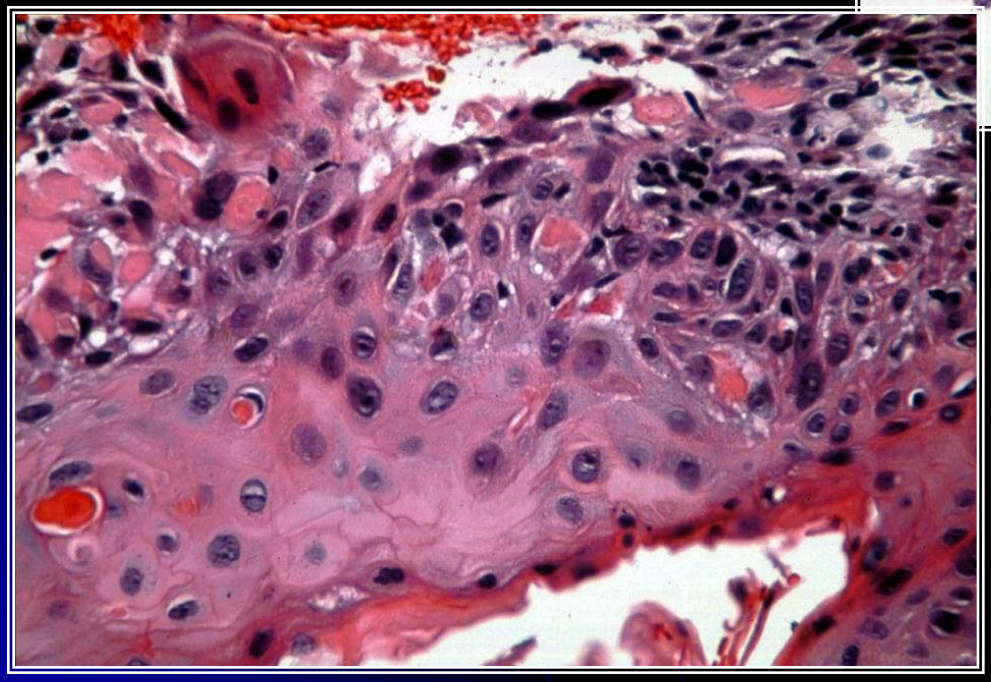
- Pterygium/pingueculum

Active

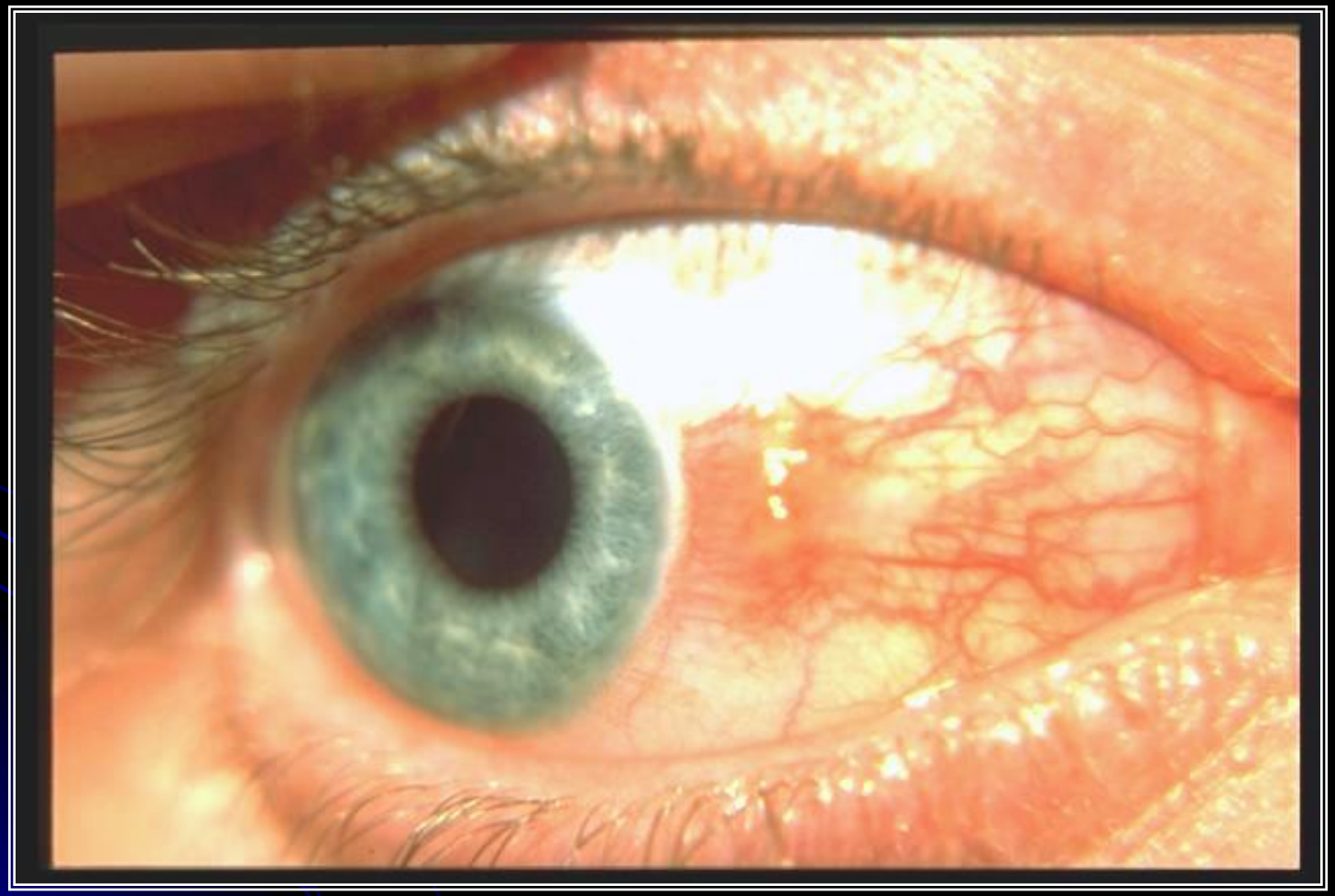
Dormant

Squamous cell carcinoma in pterygium





Pingueculum (inflammed)

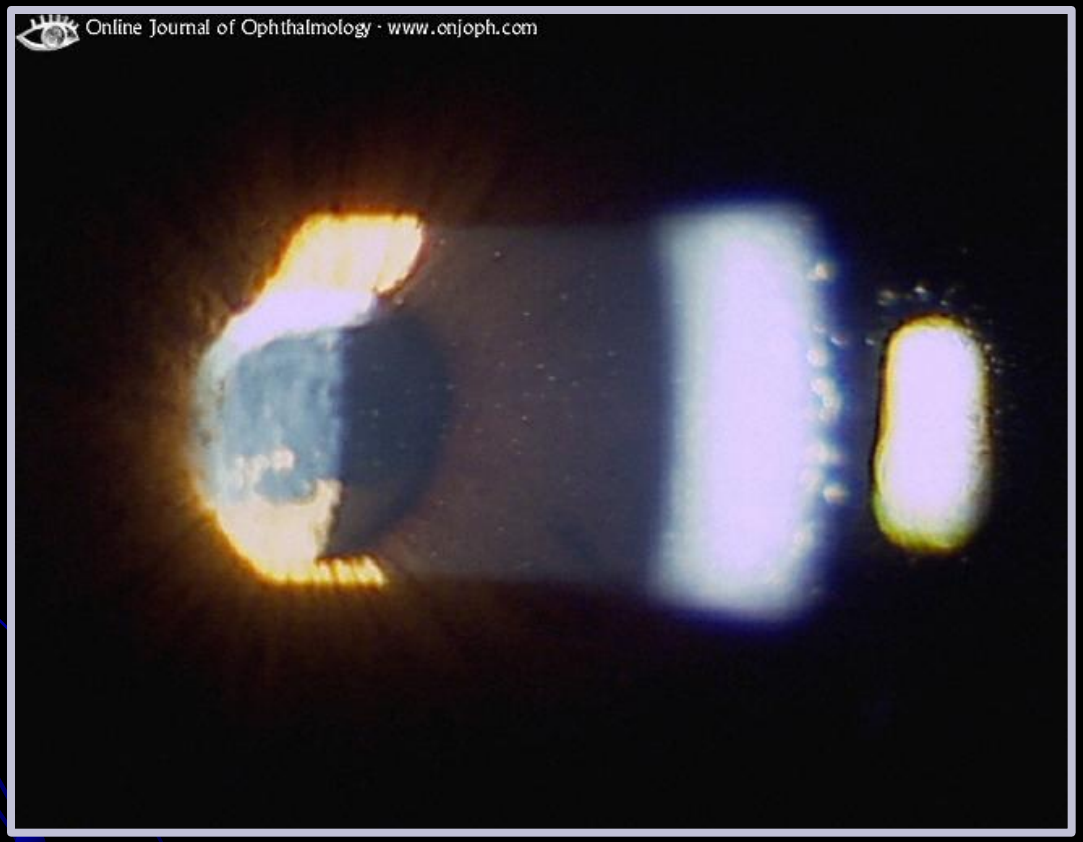


RED EYE
(VISION-THREATENING DISORDERS)

- Iritis/uveitis
- Corneal ulcers
- Angle-closure glaucoma
- Preseptal/orbital cellulitis
- Endophthalmitis
- Trauma

AC REACTION

"Flare and cell"



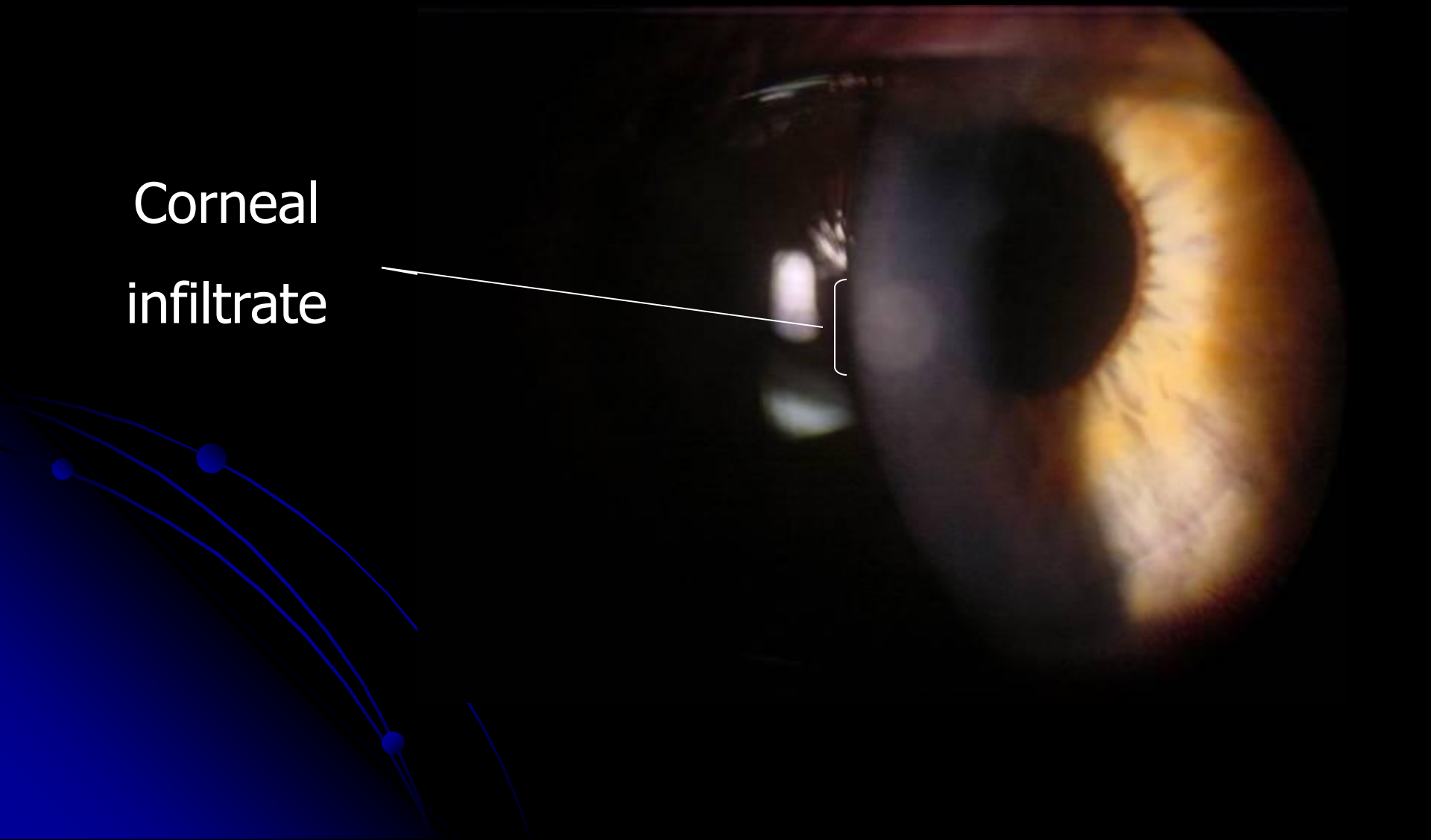
RED EYE
(VISION-THREATENING DISORDERS)

- Corneal ulcers

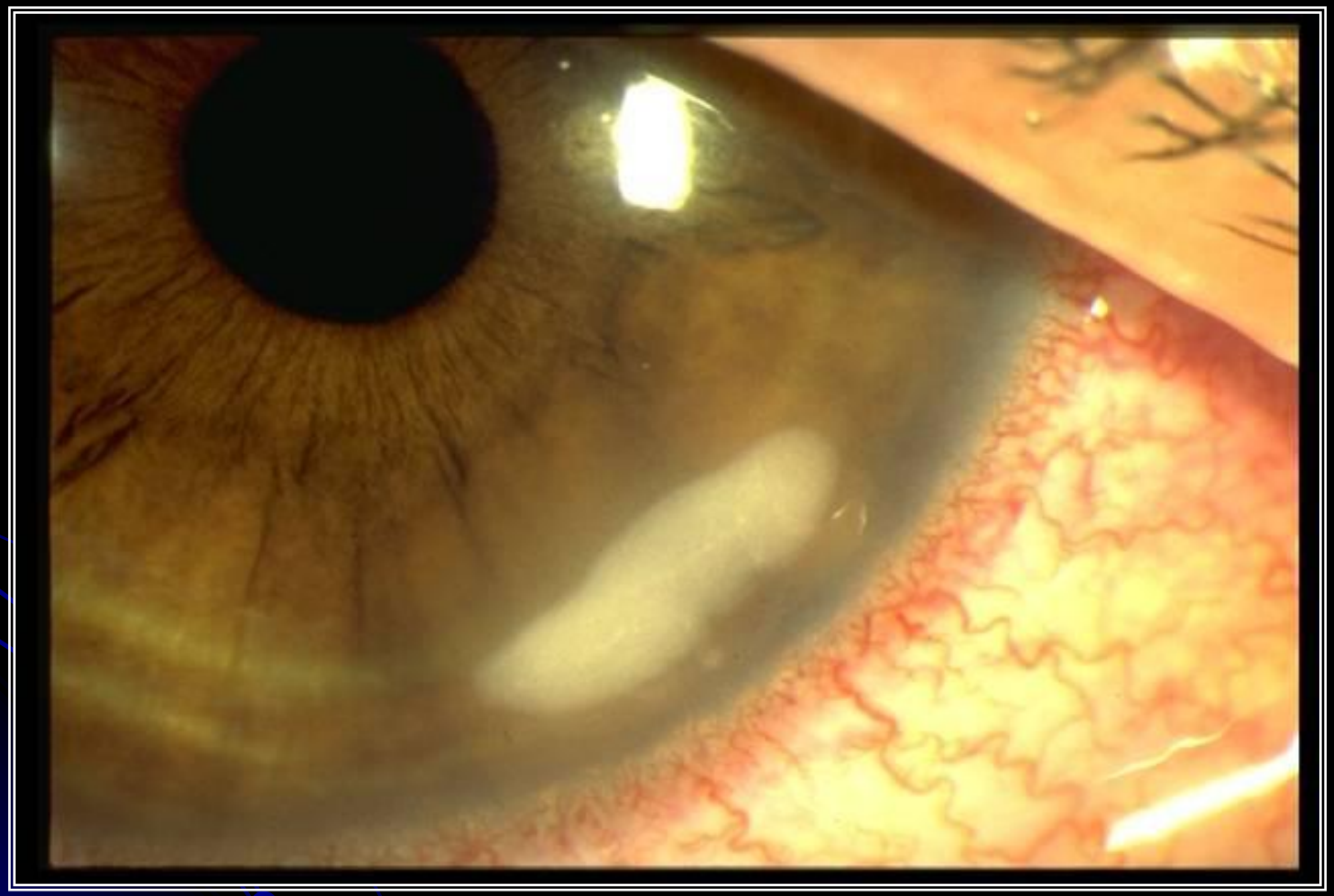
High risk group:

CW contact lens wearers

KERATITIS



Marginal ulcer with infiltrate



External examination

Hypopyon

Narrow angle glaucoma

- Onset 50+ y.o.
- Severe eye pain
- Blurred vision
- Red eye
- Headache/nausea
- Corneal edema
- Mid-dilated, fixed pupil
- “Glaukomflecken”
- Iris atrophy
- Severe anterior chamber inflammation

Angle closure attack!

- Severe pain
- Blurred vision
- Mid-dilated, fixed pupil
- Hazy cornea

RED EYE
(VISION-THREATENING DISORDERS)

- Preseptal/orbital cellulitis

Orbital Cellulitis

- Severe pain
- Proptosis
- Limited EOMs
- Conjunctival congestion
- Diabetic?

Frontal, ethmoid, maxillary and orbital abscesses

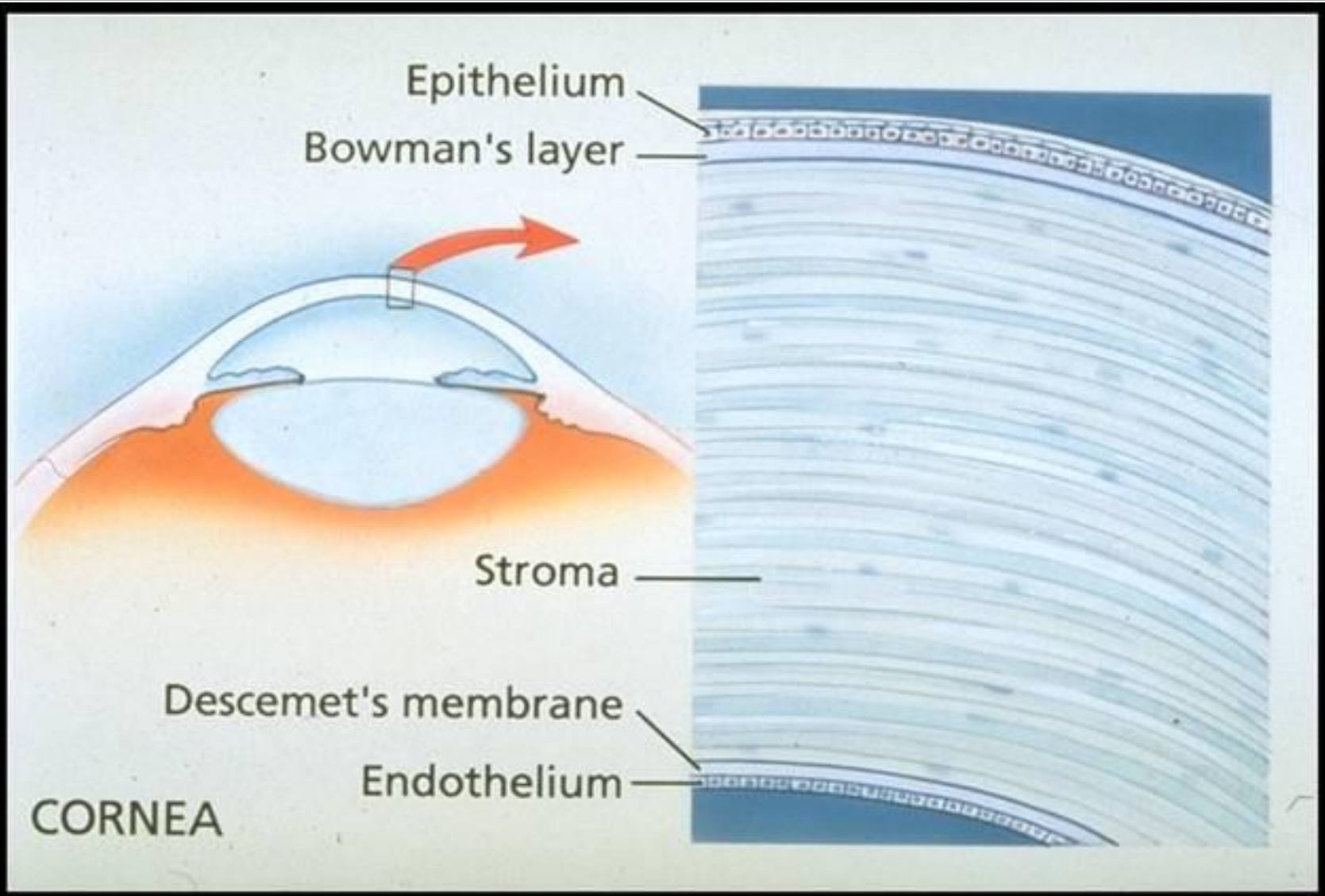
RED EYE
(VISION-THREATENING DISORDERS)

- **Endophthalmitis**

- Severe pain
- Photophobia
- Poor vision
- Recent intra-ocular surgery

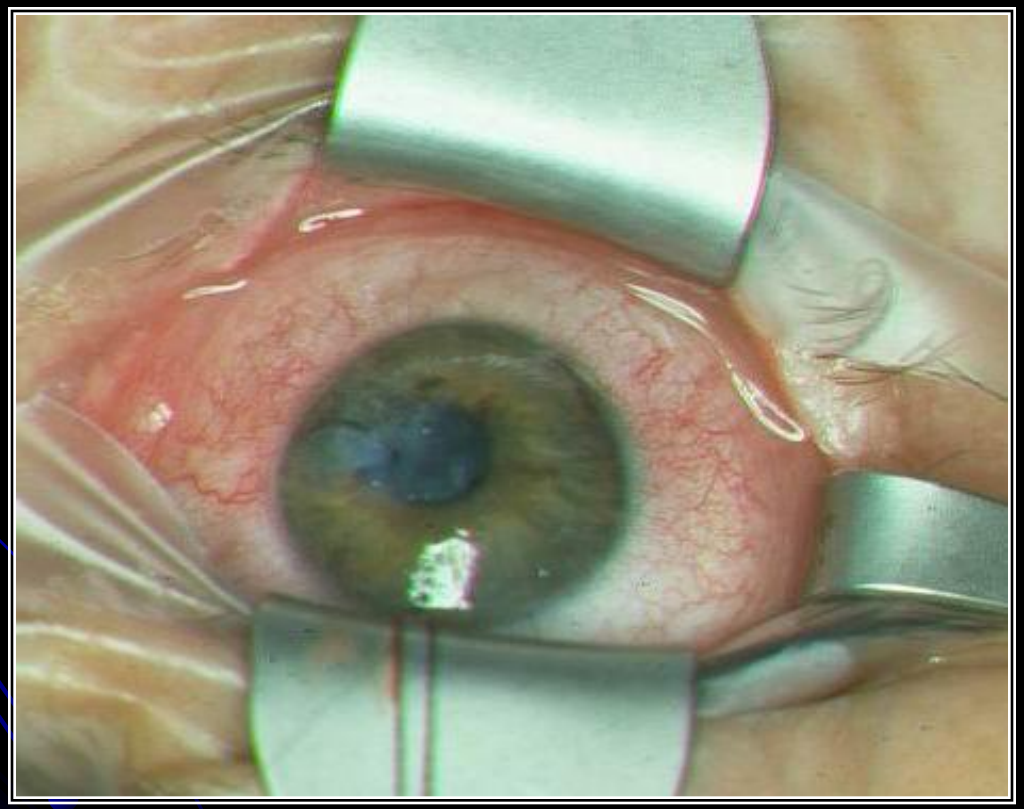
OCULAR TRAUMA

- Disruption of globe
- Intraocular foreign bodies
- Hyphemas
- Orbital wall fractures
- Foreign bodies
- Corneal abrasions
- Complications of blunt trauma

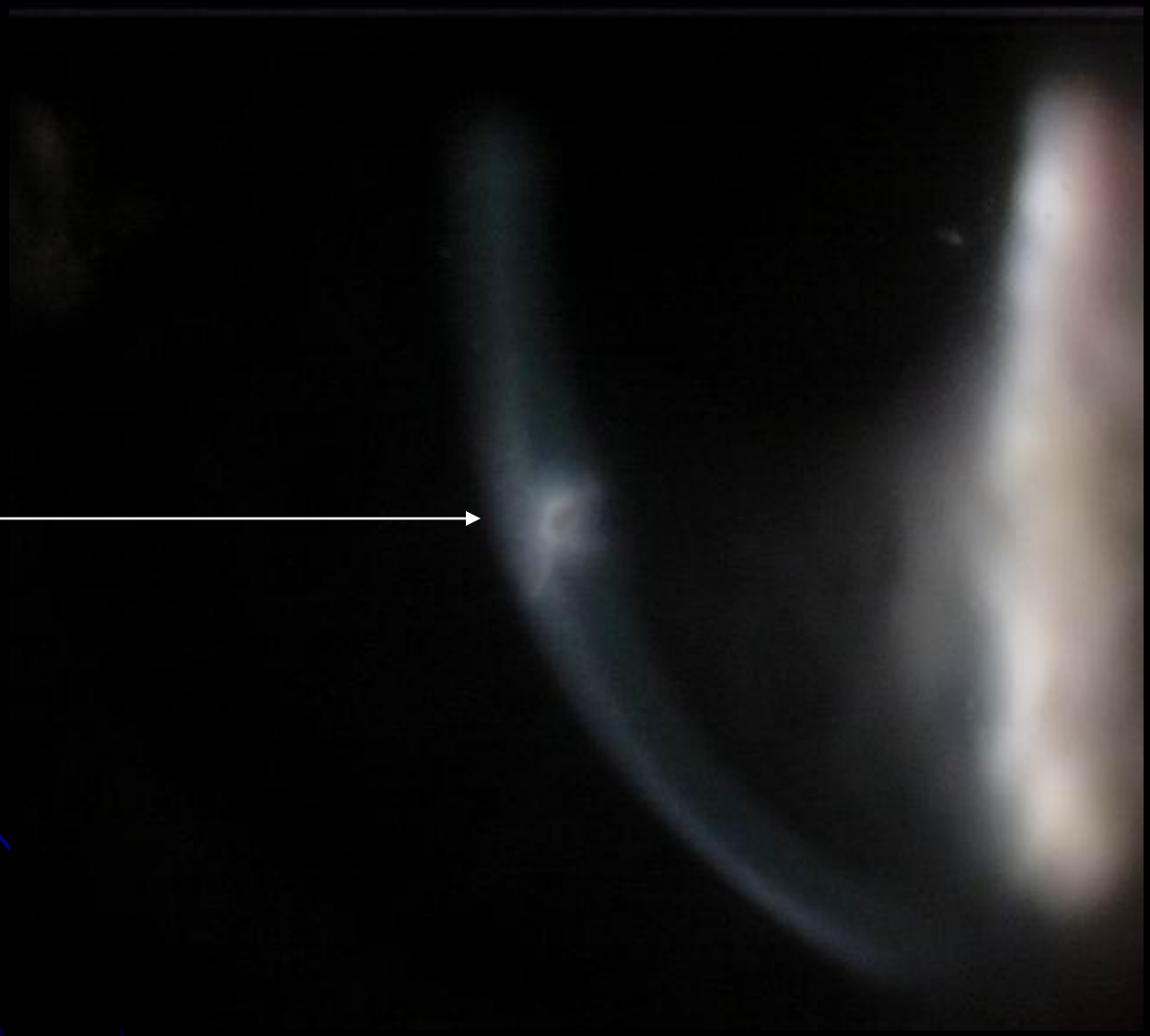

Epithelium
Bowman's layer
Stroma
Descemet's membrane
Endothelium
CORNEA

OCULAR TRAUMA
(Complications of blunt trauma)

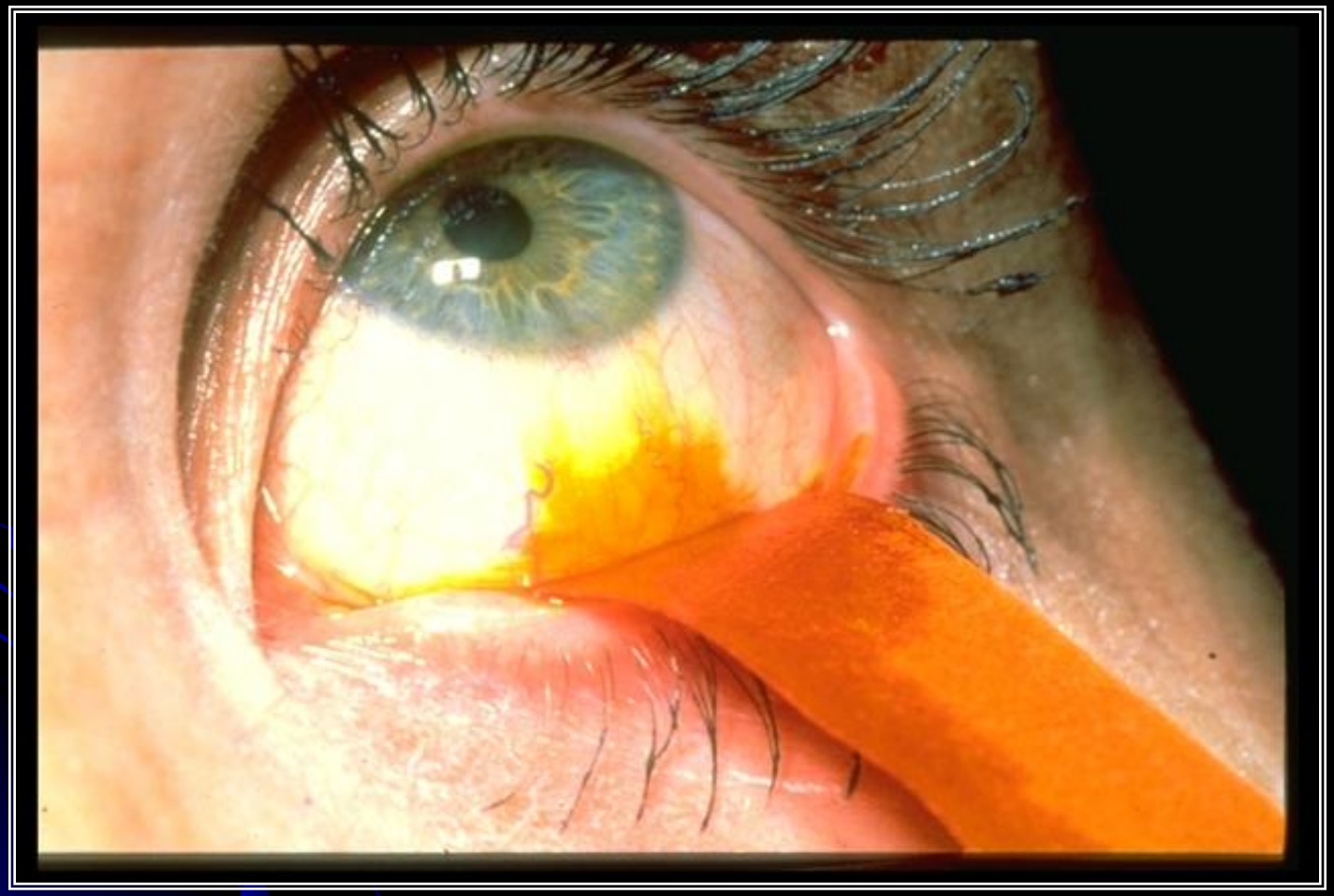
- Disruption of globe



Perforated or not?

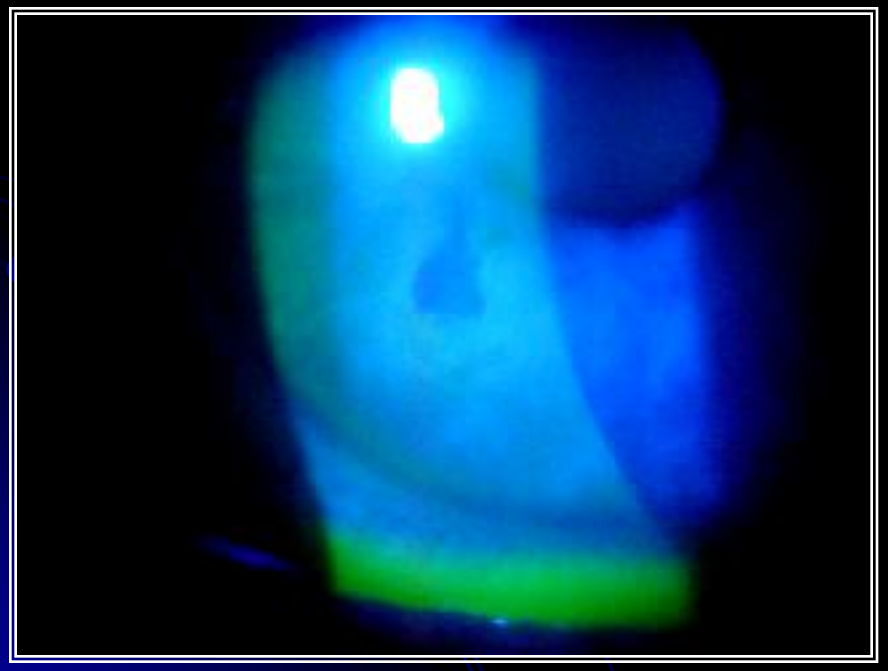


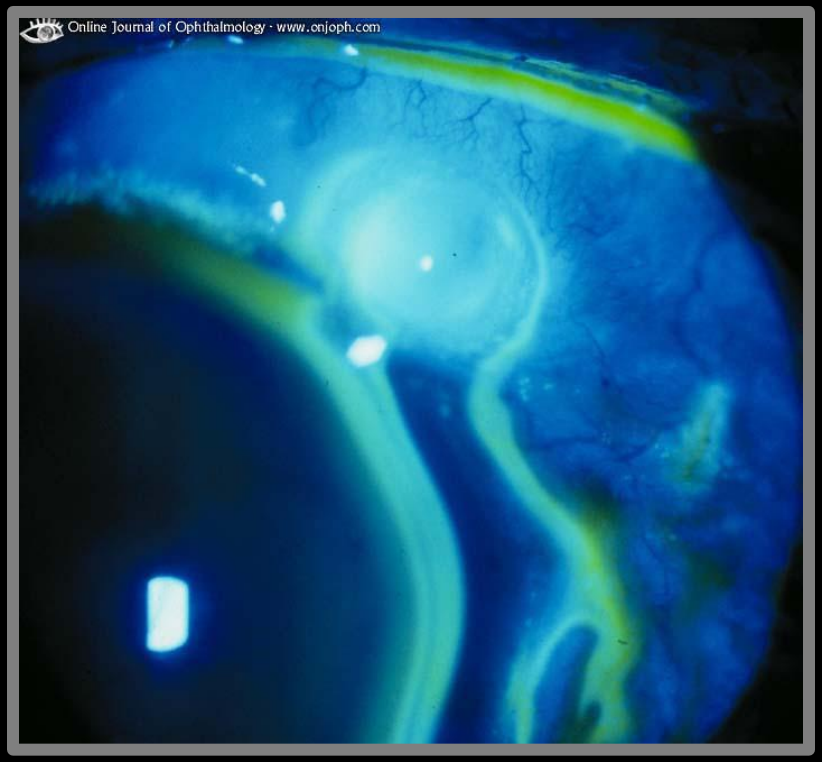
Seidel test: Use concentrated fluorescein



POSITIVE SEIDEL

Pinpoint perforation





Leaking bleb

OCULAR TRAUMA

- Perforating trauma

The pupil is your clue

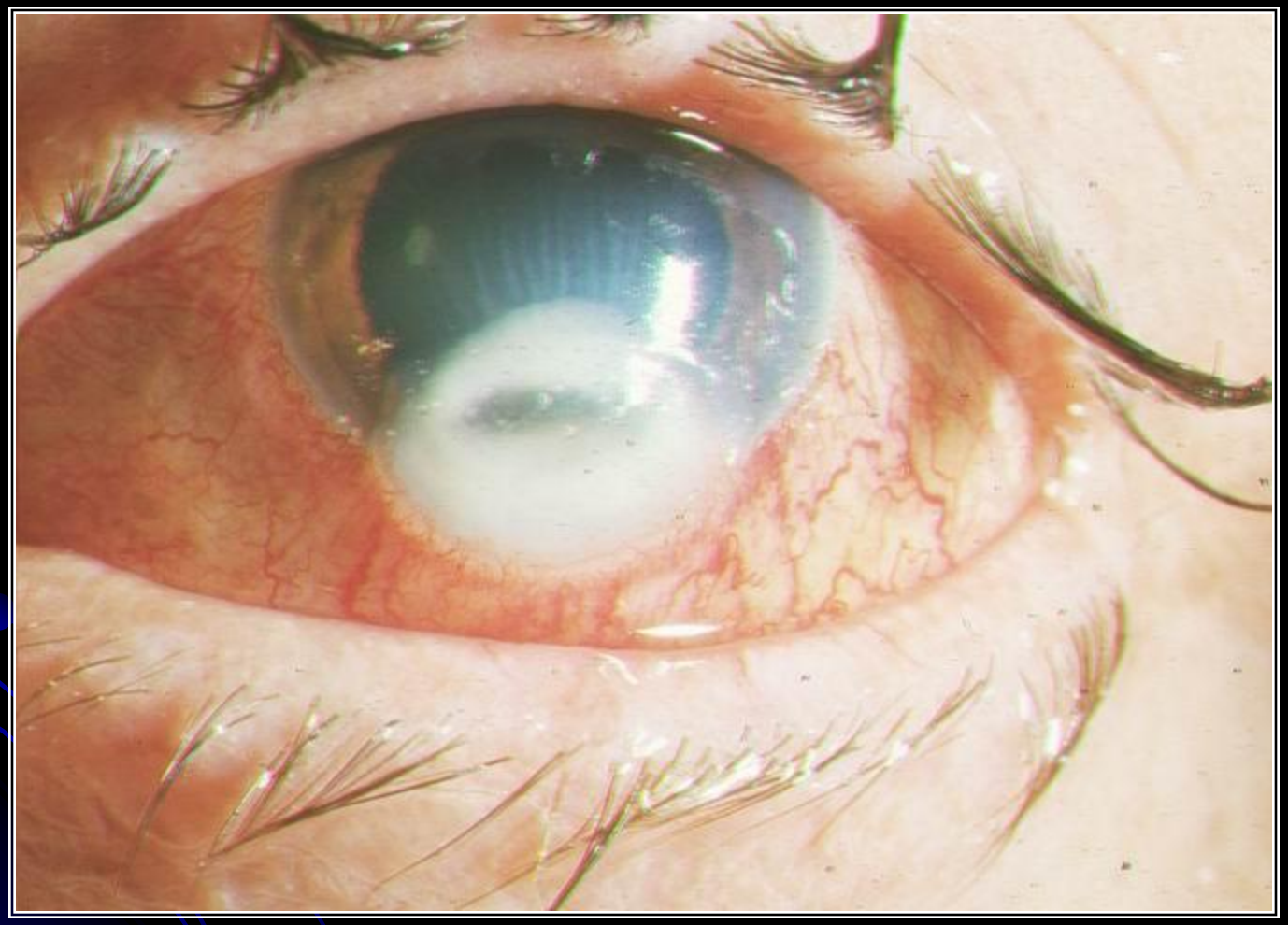
OCULAR TRAUMA

- Perforating trauma

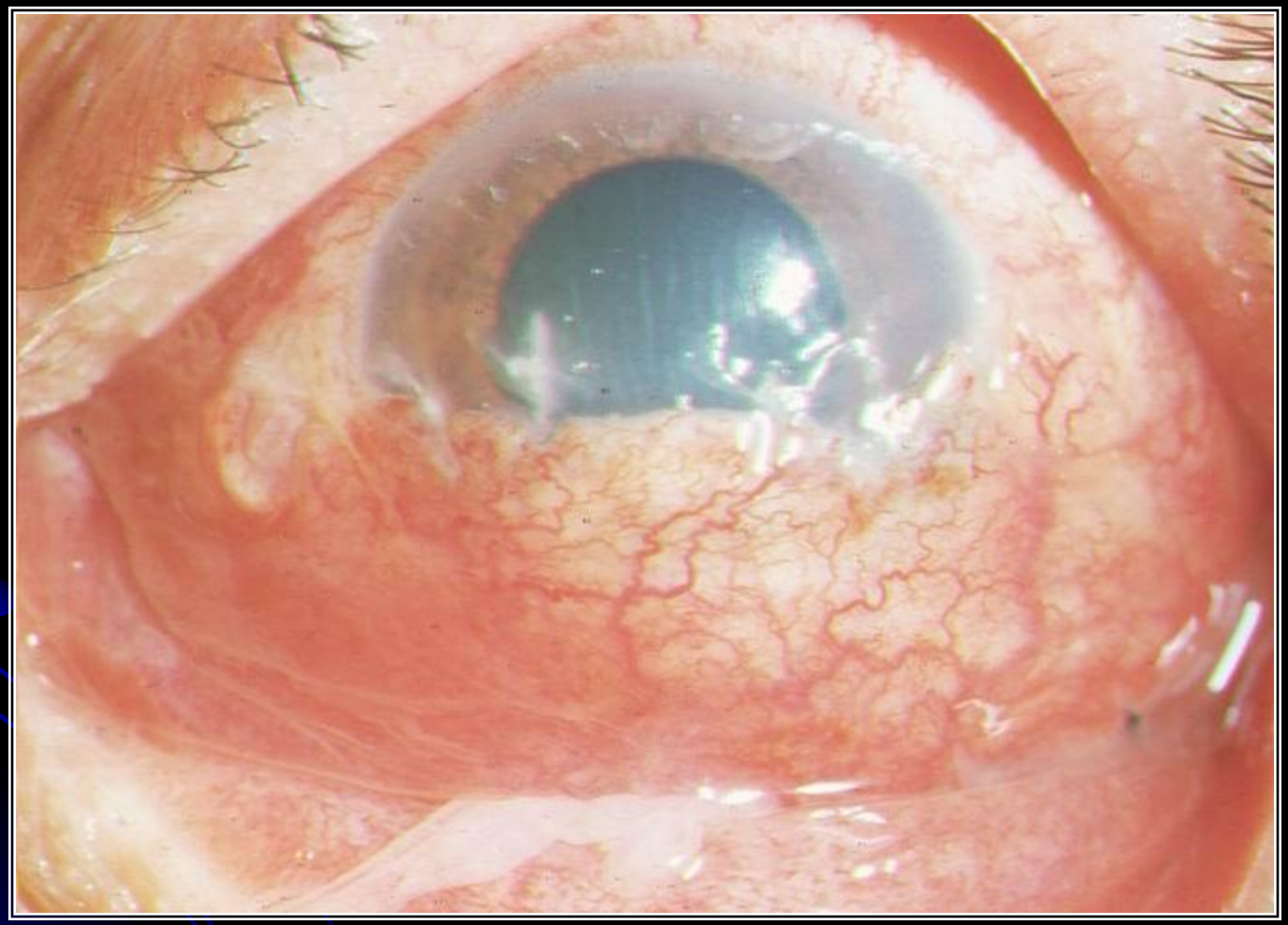
Dart puncture with eyelash

Corneal puncture wound with abscess

After 3 days of Garamycin Rx

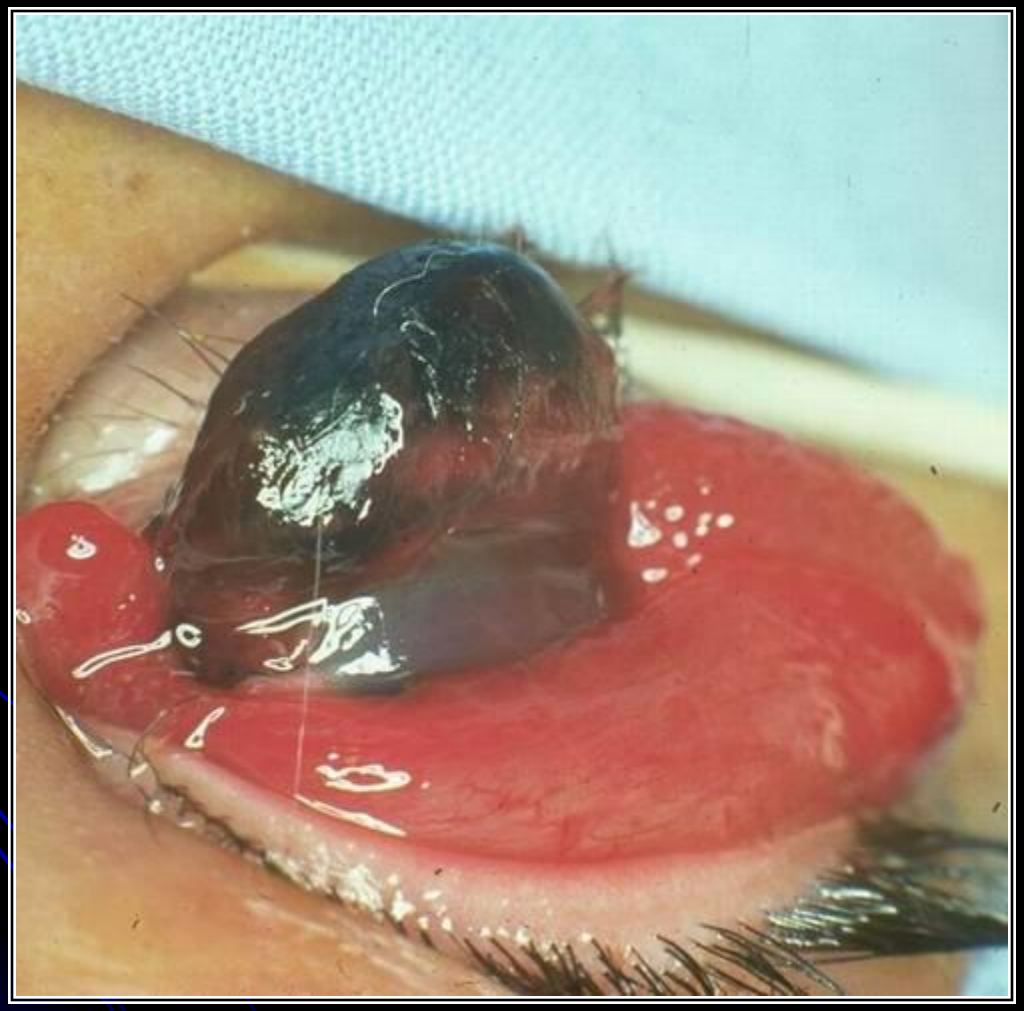


Conjunctival flap



Three months after flap

DISASTER!



SYMPATHETIC OPHTHALMIA

(BILATERAL granulomatous panuveitis after trauma)

- Onset: 5 days to 66 years after penetrating trauma
- Onset: 33% at 3 mo., <50% after 1 year
- Removal of injured eye after onset does not help
- Cause: antigen-antibody interaction
- Risk: 0.015-1.9% (lowest after planned surgery)
- Treatment: immunosuppressive therapy

OCULAR TRAUMA

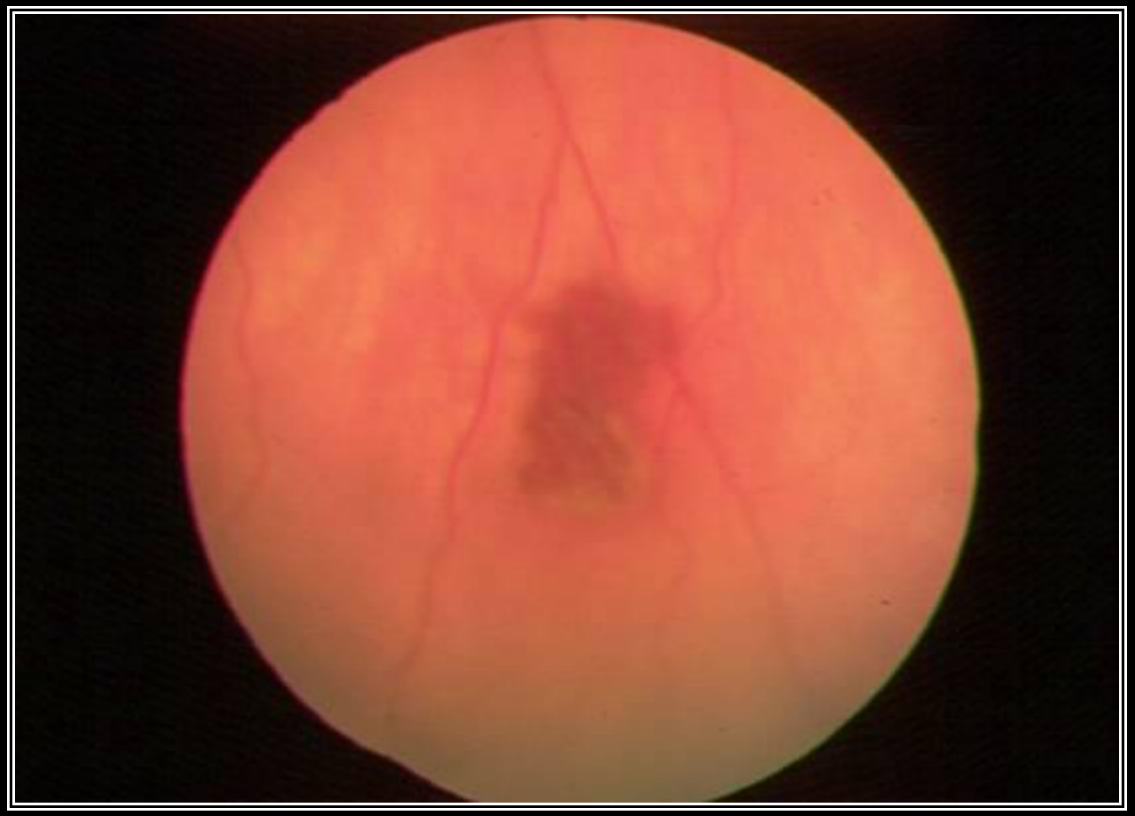
- Intraocular foreign bodies
- Hyphemas
- Orbital wall fractures
- Foreign bodies
- Corneal abrasions
- Chemical burns
- Corneal lacerations

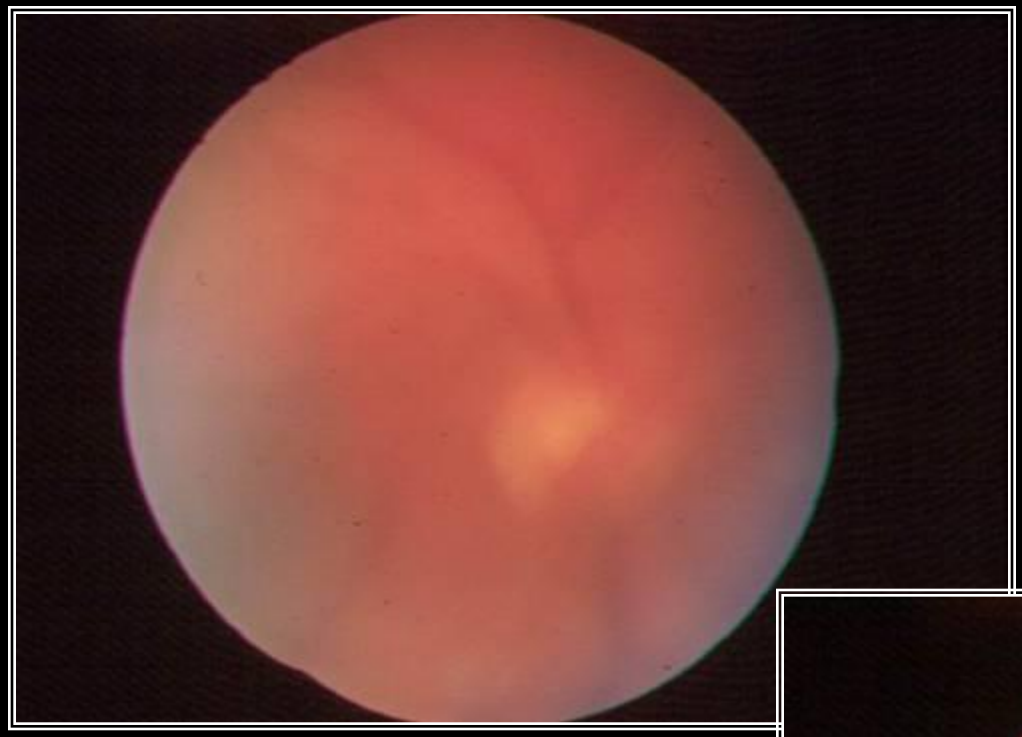
Evaluation of intraocular foreign bodies

- Determine visual acuity
- Examine for global integrity and degree of damage
- Do fundus examination
- Place shield over eye
- Call ophthalmologist

OCULAR TRAUMA

- Intraocular foreign bodies





Situation worsening!

Poor visibility

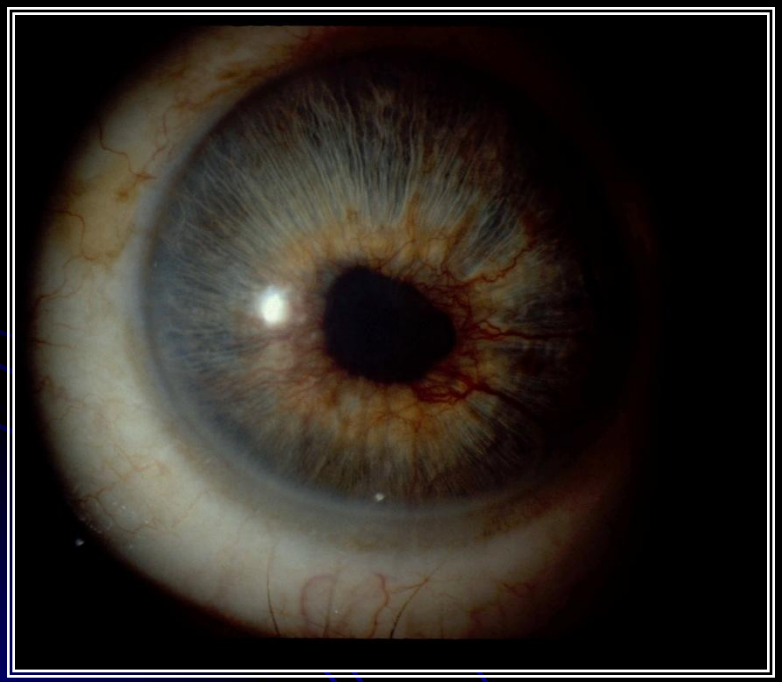
Metal fragment

Complications of Blunt Trauma

- Ruptures of the globe
- Hyphema
- Blow-out fractures
- Retinal tears/detachments
- Glaucoma
- Cataract
- Dislocation of the lens

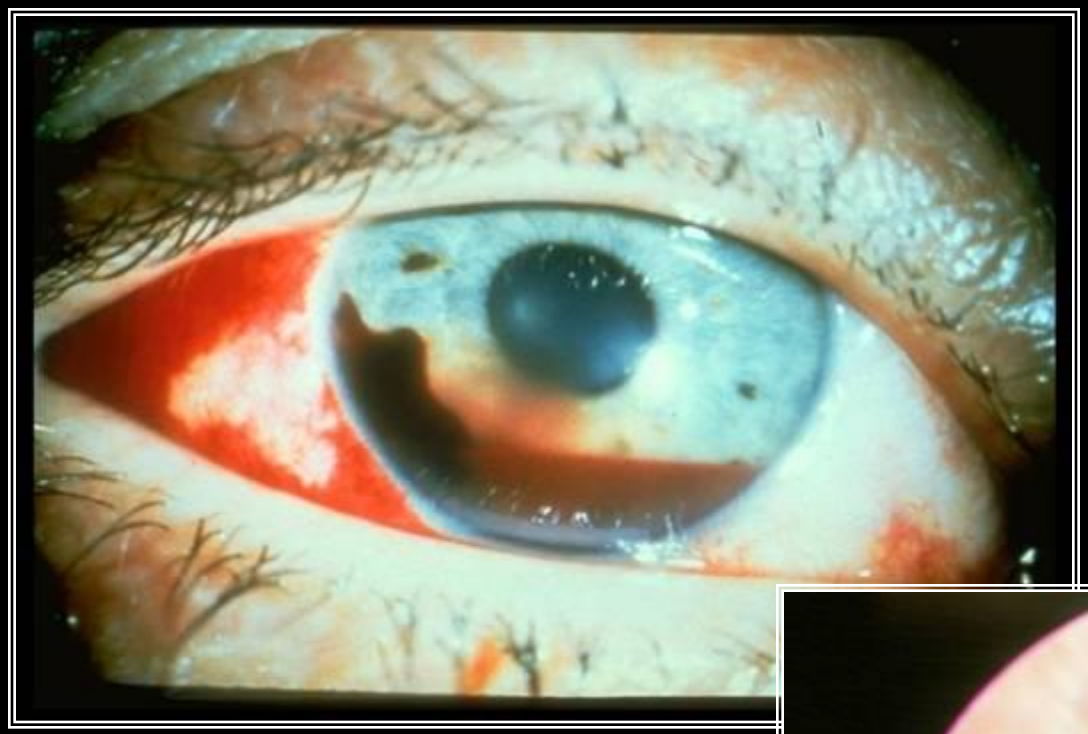
OCULAR TRAUMA

- Hyphemas

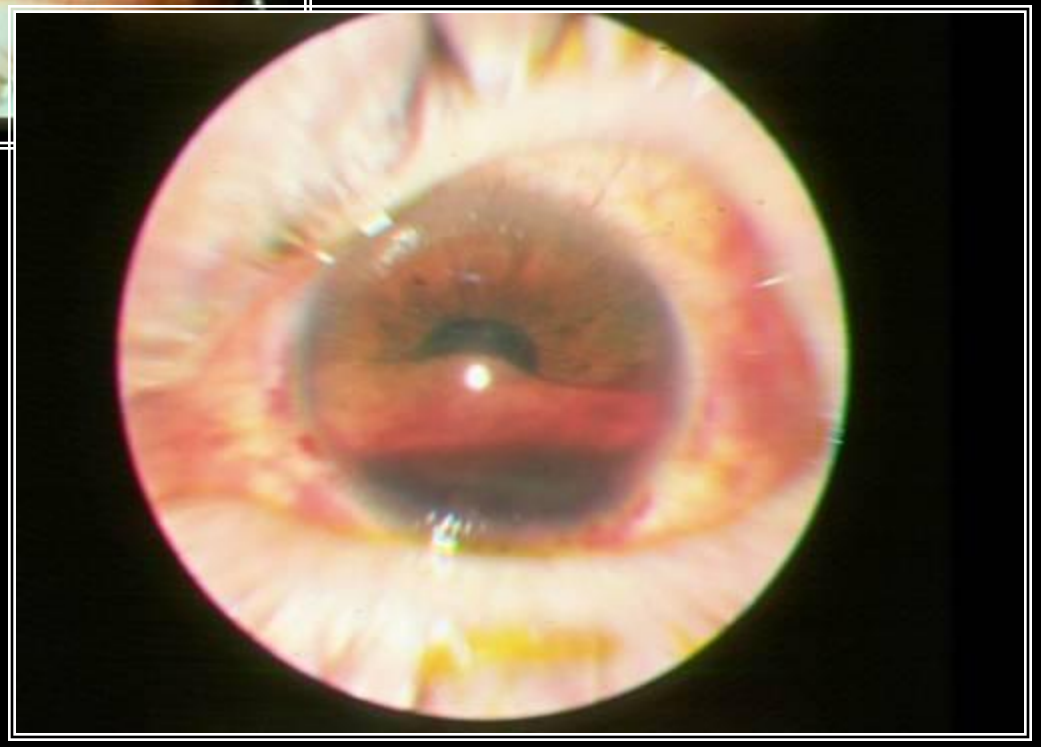


Rubeosis

Hyphema



Layered hyphemas



Visual prognosis among traumatic hyphemas

Degree of hyphema	No. of Patients	Percent with final acuity >20/50	Percent with final acuity <20/200
Partial hyphema	191	**77**	**16**
Total hyphema	36	**33**	**55**
All hyphemas	227	**70**	**22.5**

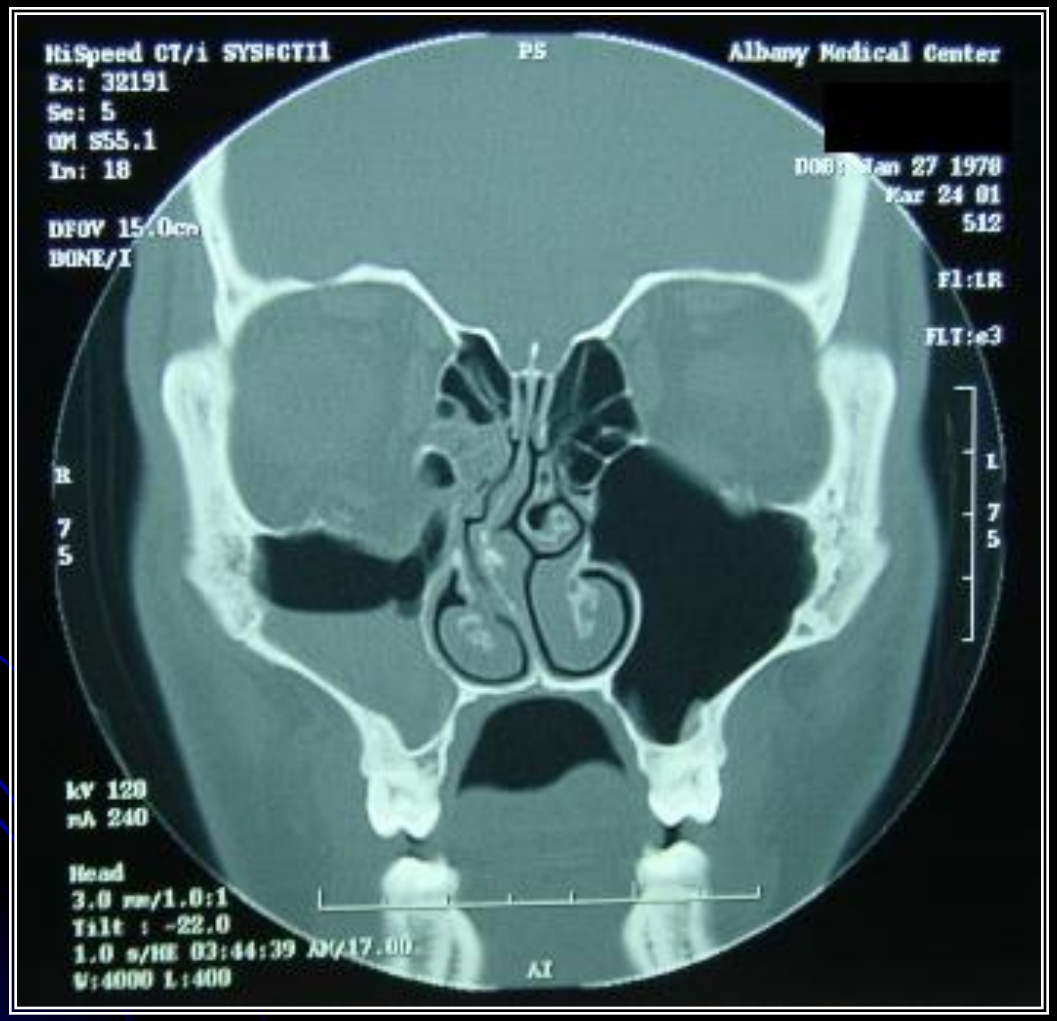
8 month followup Am J Ophthal 5: 1, 1973

OCULAR TRAUMA

- Orbital wall fractures

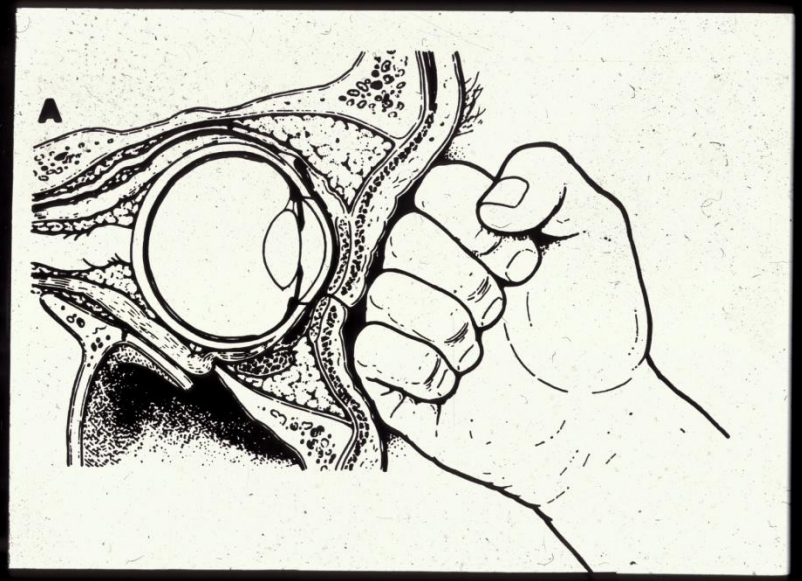
With muscle entrapment

Classic blowout fracture of orbital floor and ethmoids

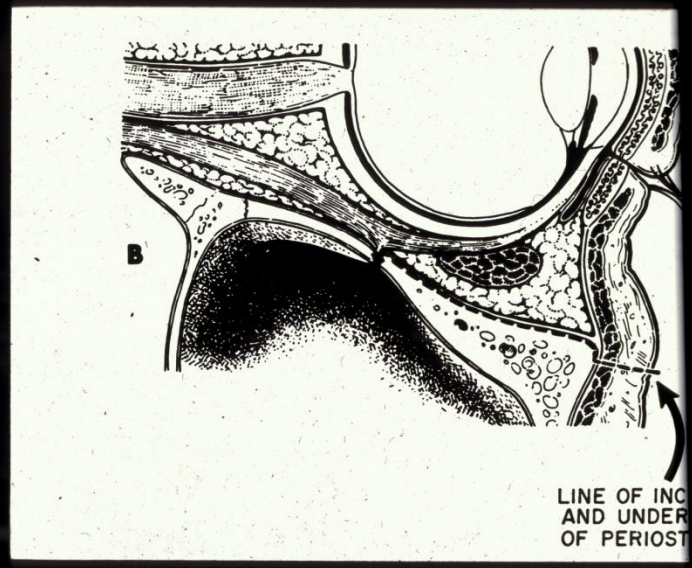


OCULAR TRAUMA

Orbital floor fracture

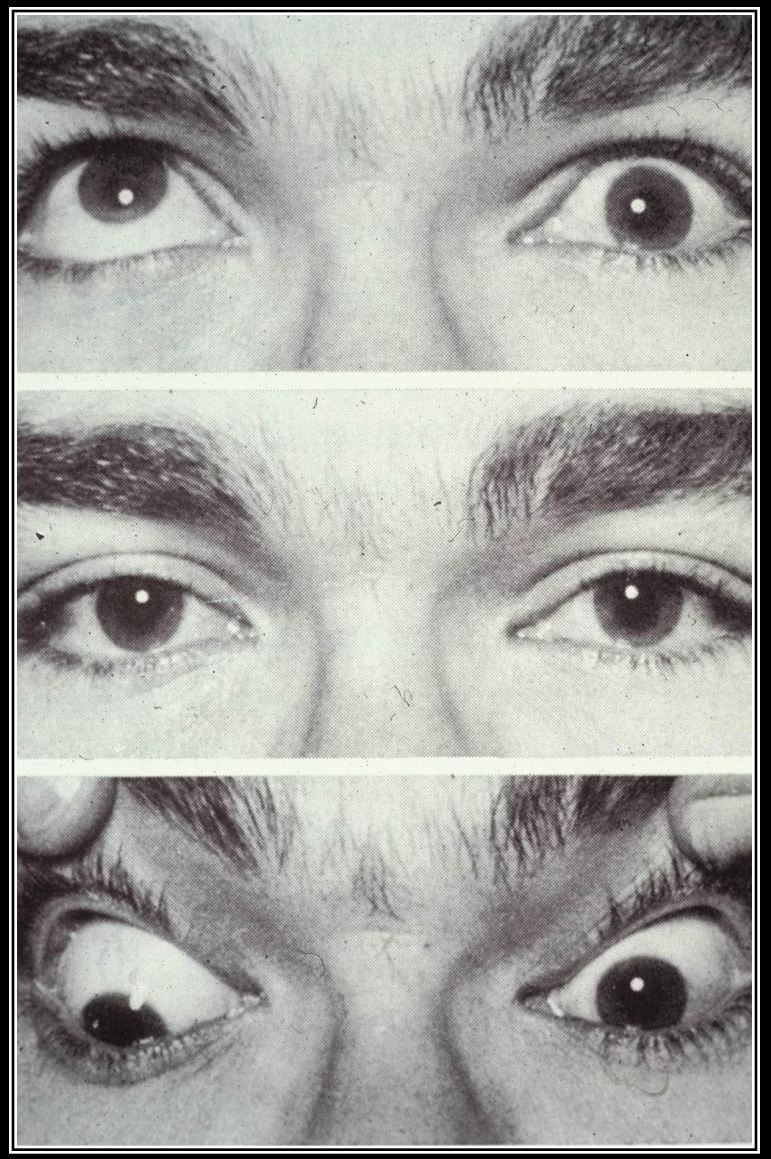


Muscle entrapment



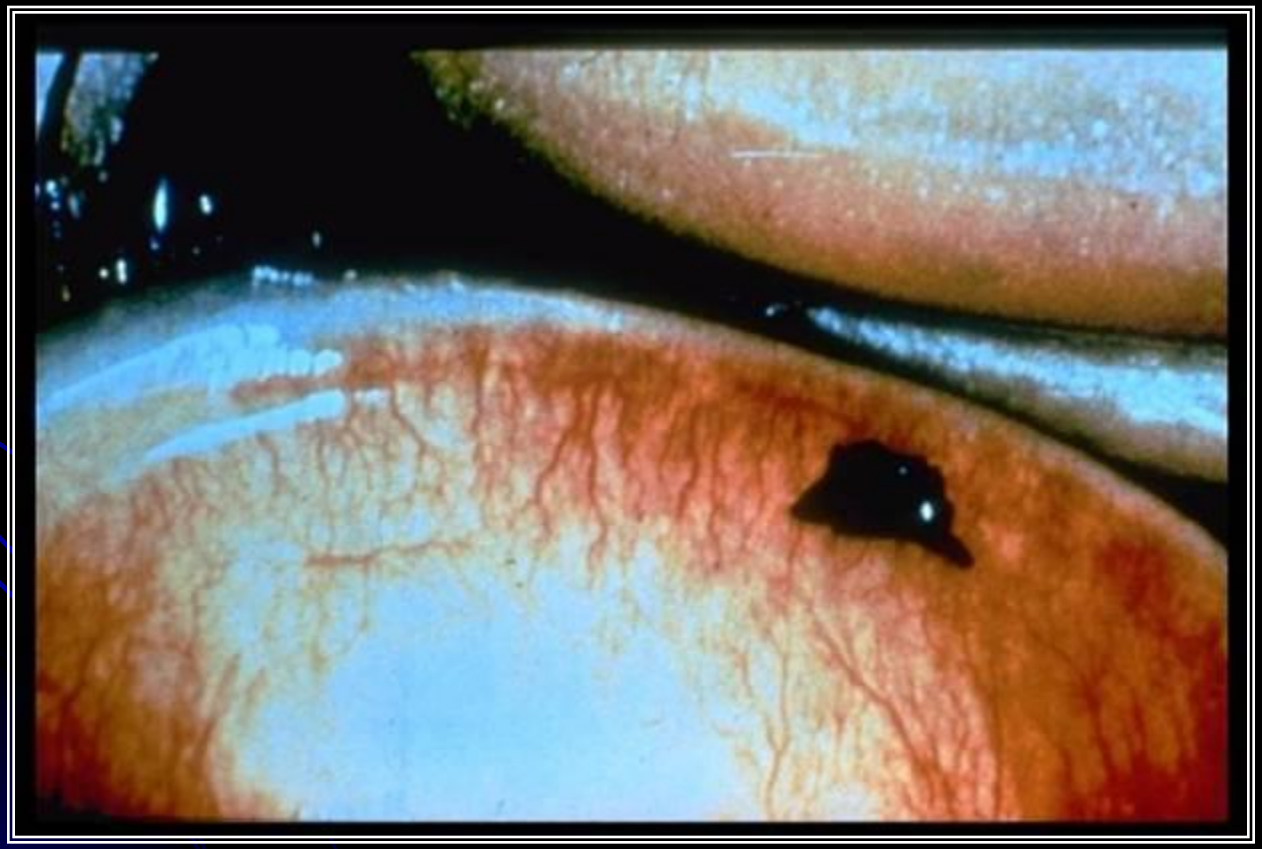
OCULAR TRAUMA

Entrapment of inferior rectus muscle following blowout fracture



OCULAR TRAUMA

- Foreign bodies



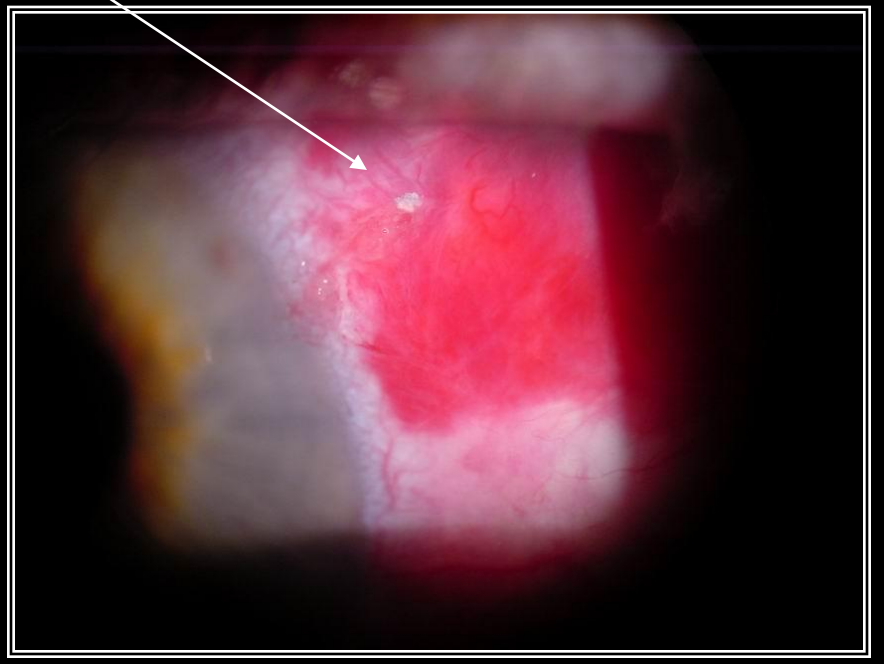
RED EYE

(Rule out trauma)

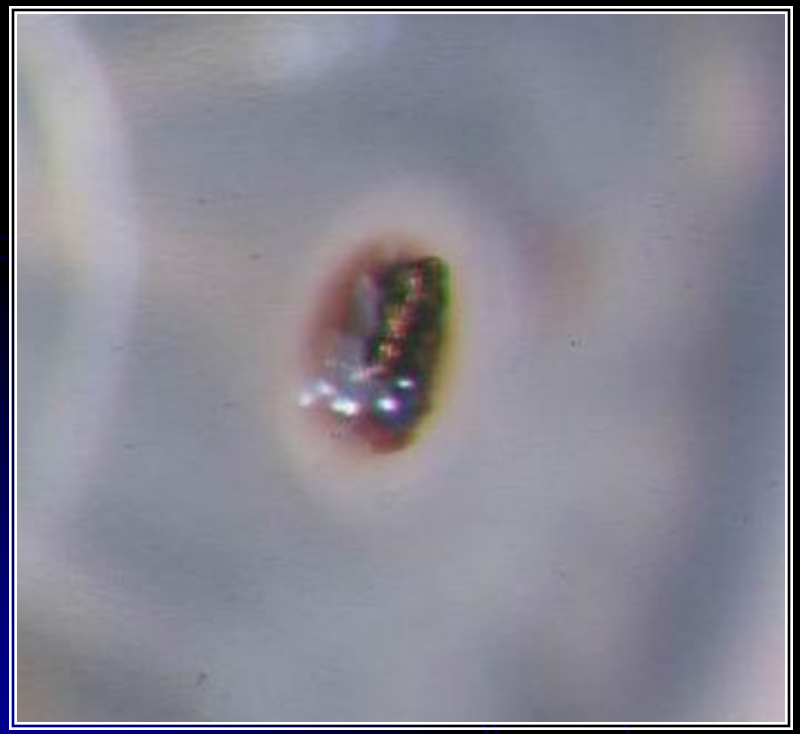
- Foreign bodies

Organic

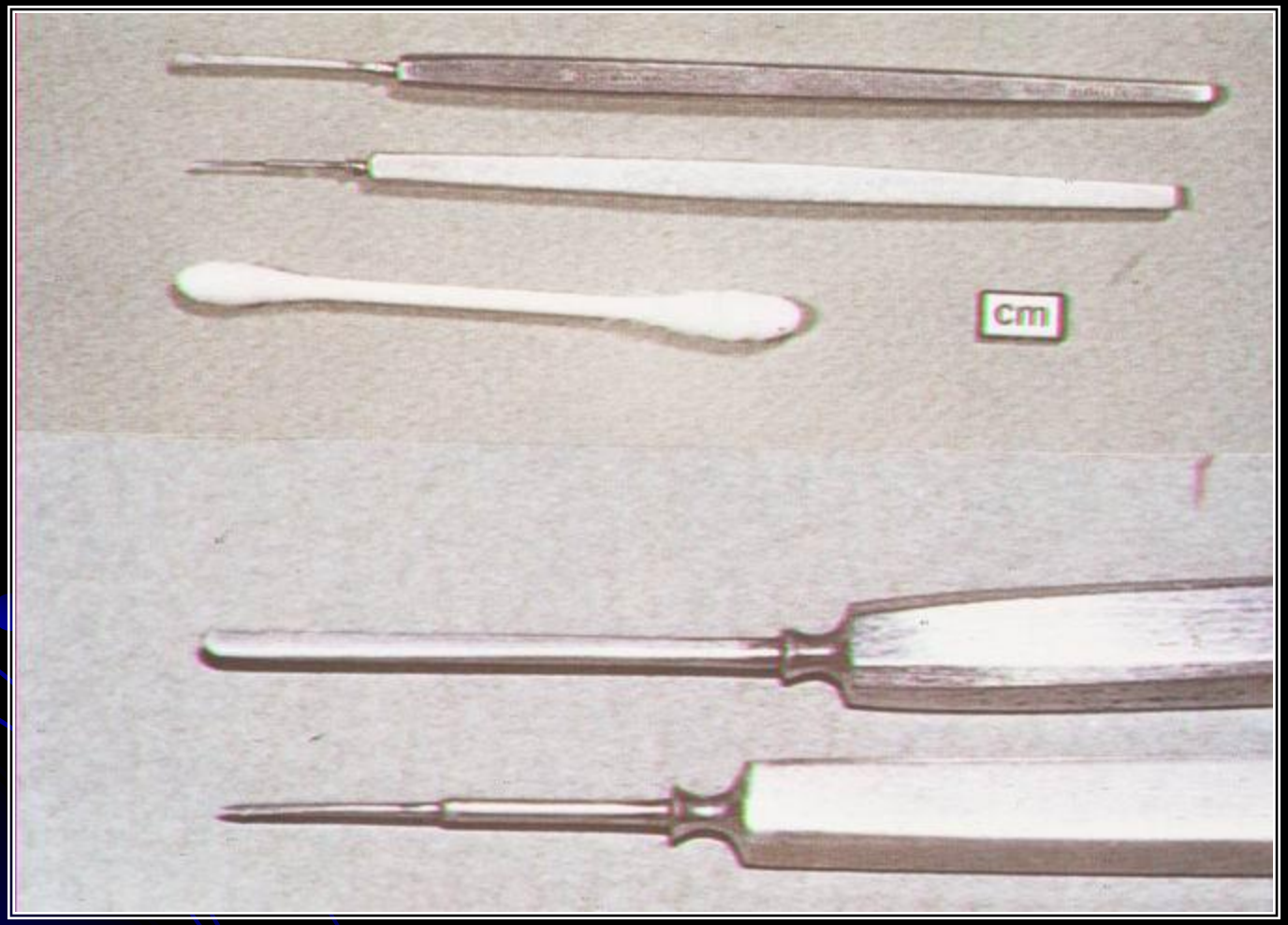
Metallic

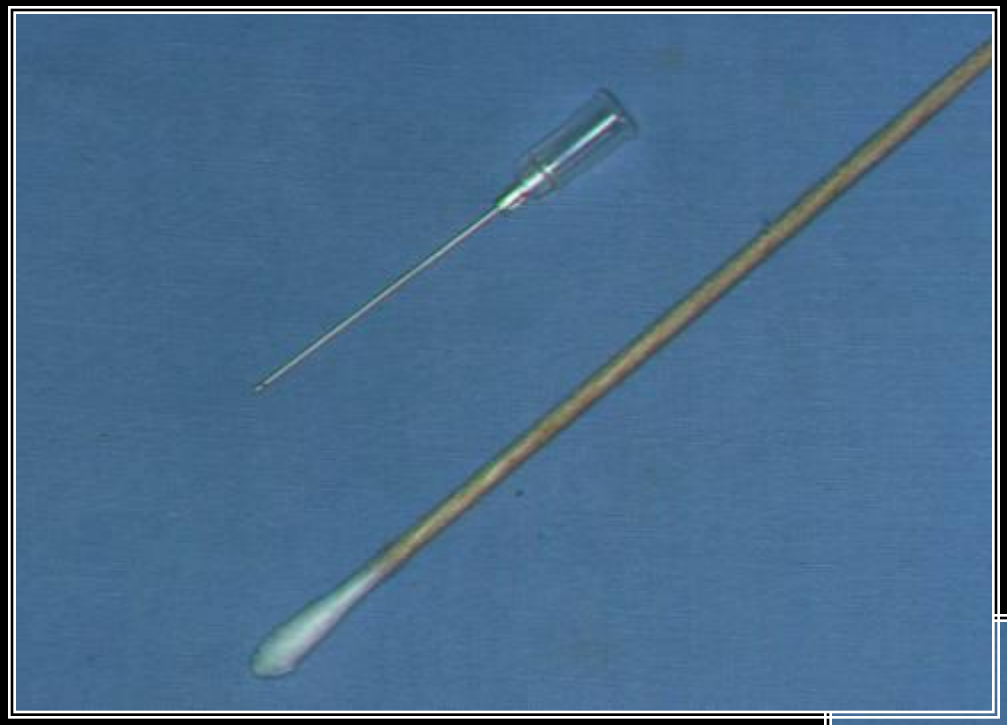


Corneal foreign bodies

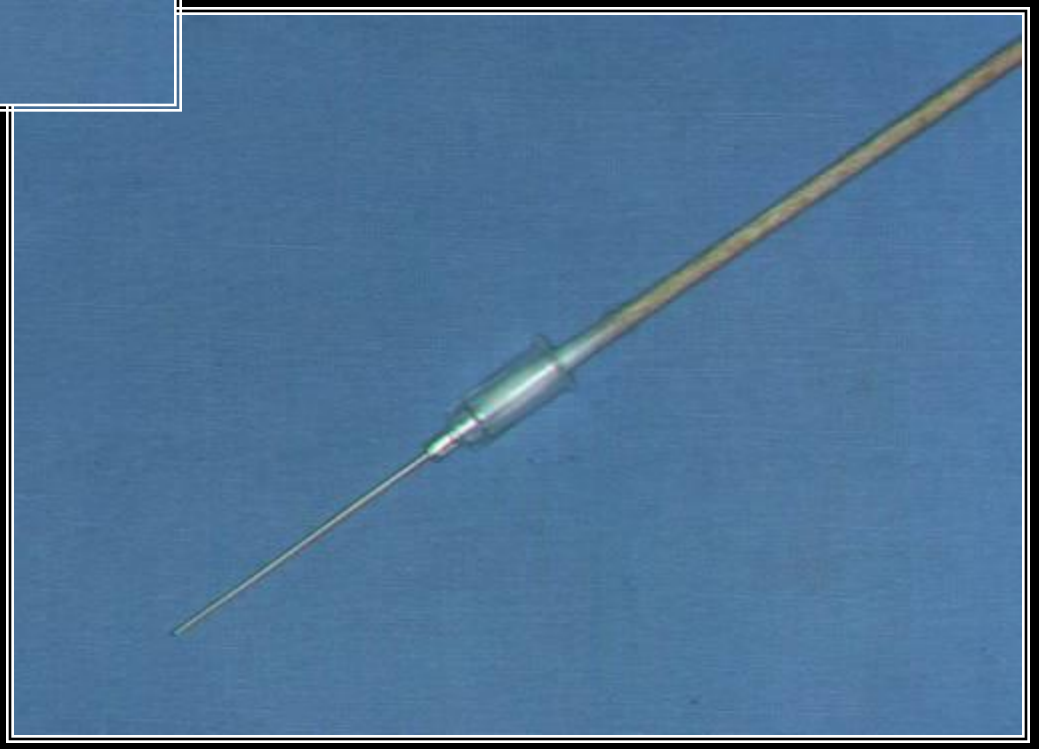


Instruments

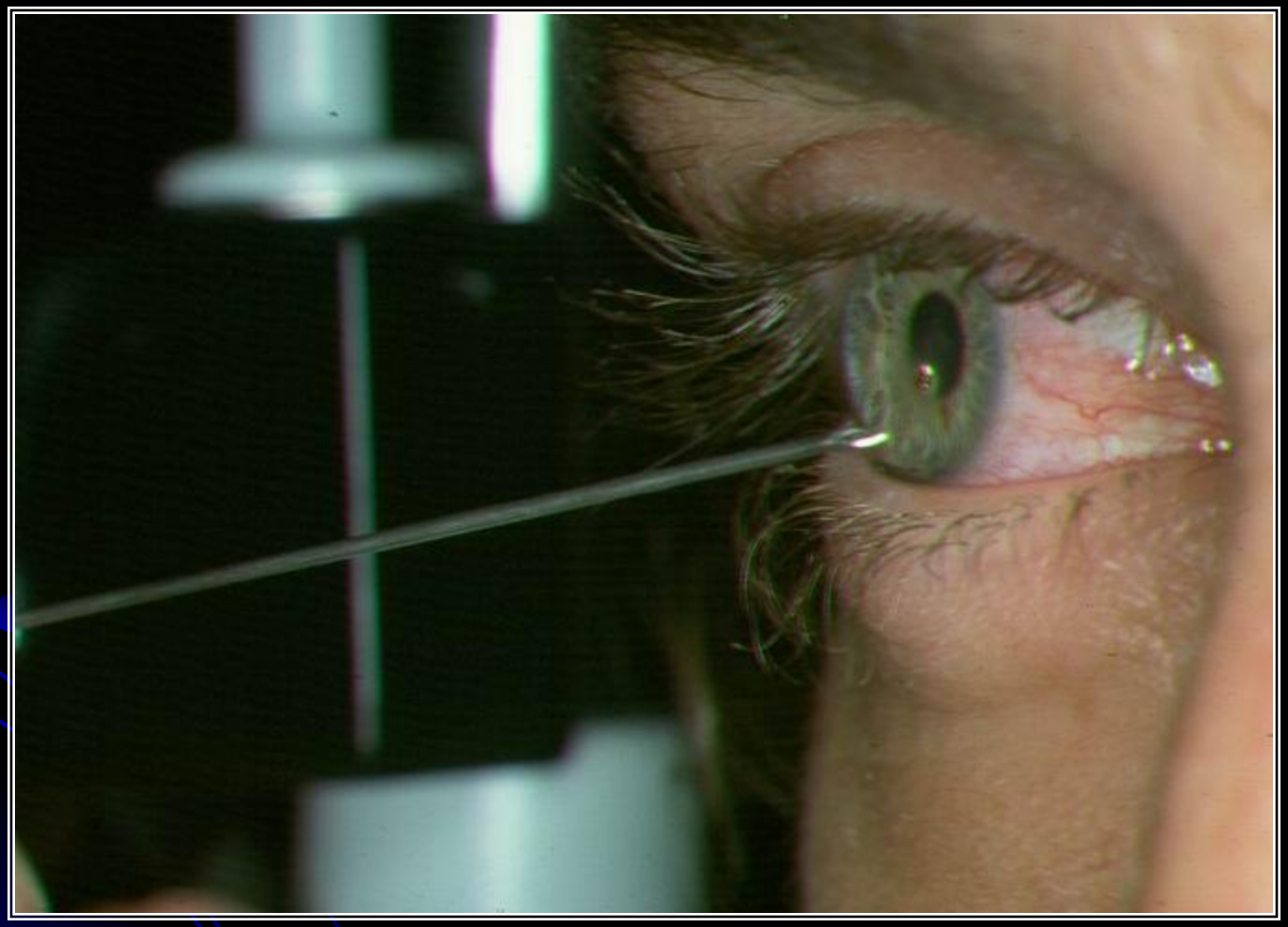




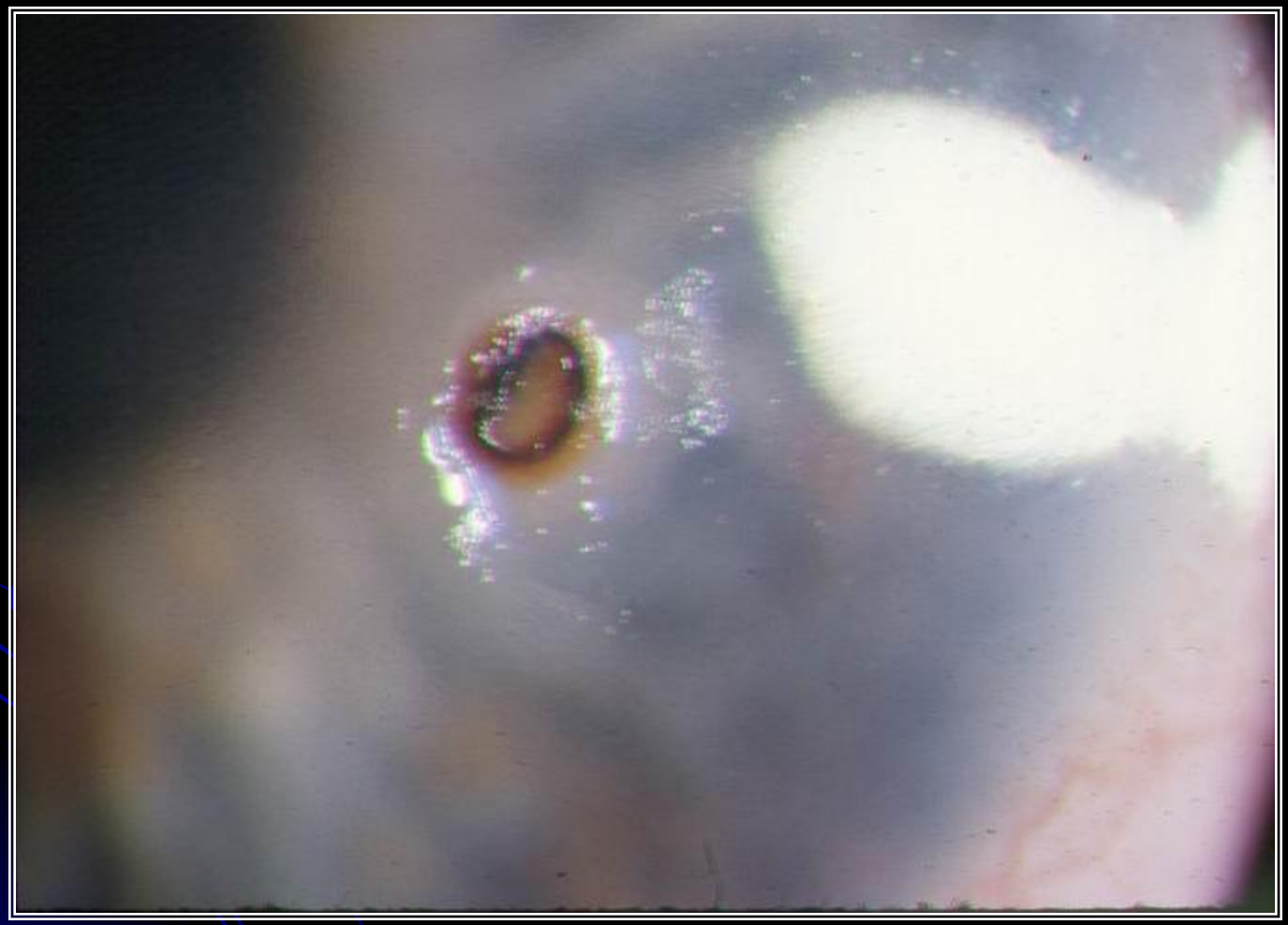
In-office tool



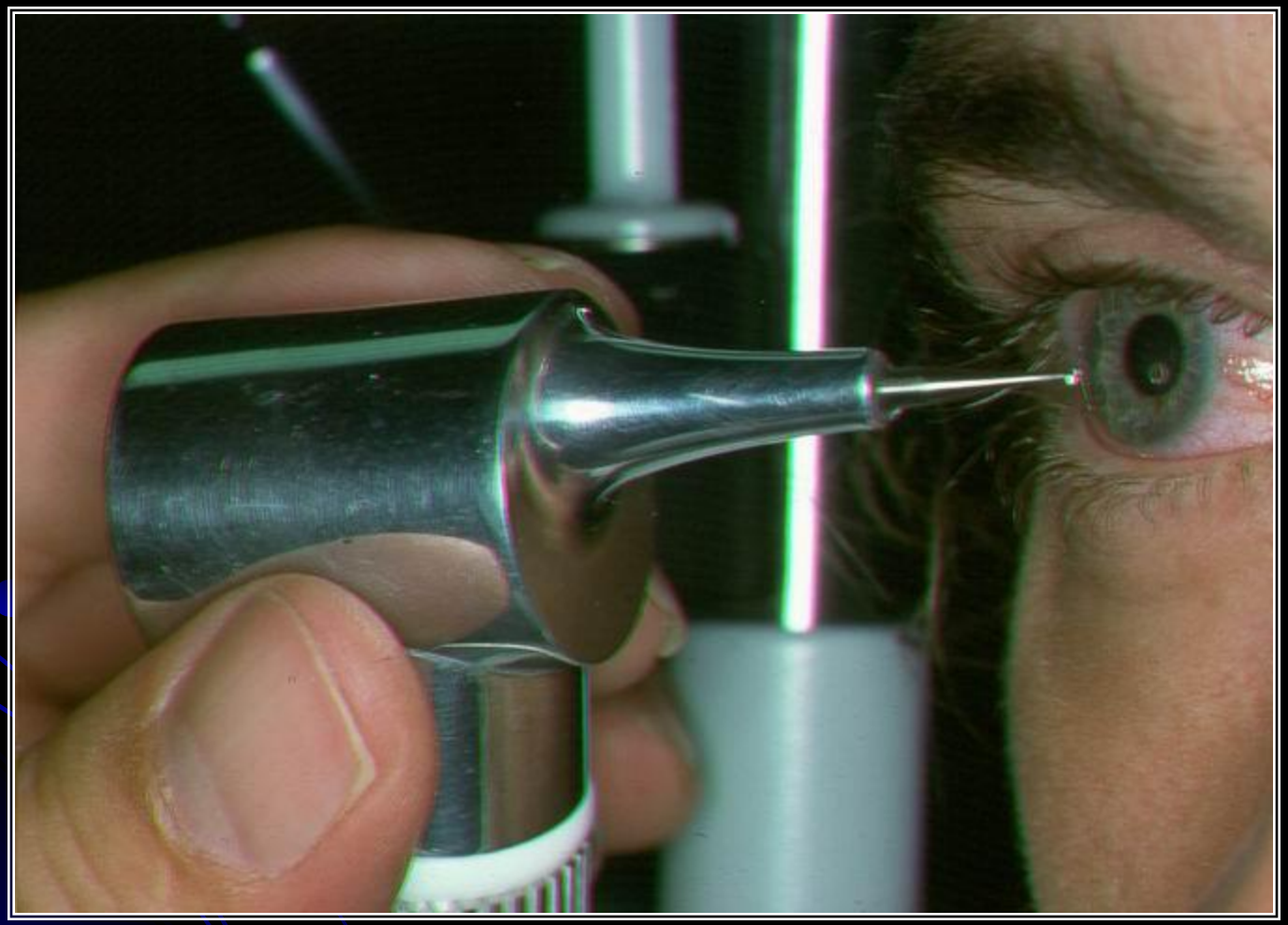
No, No



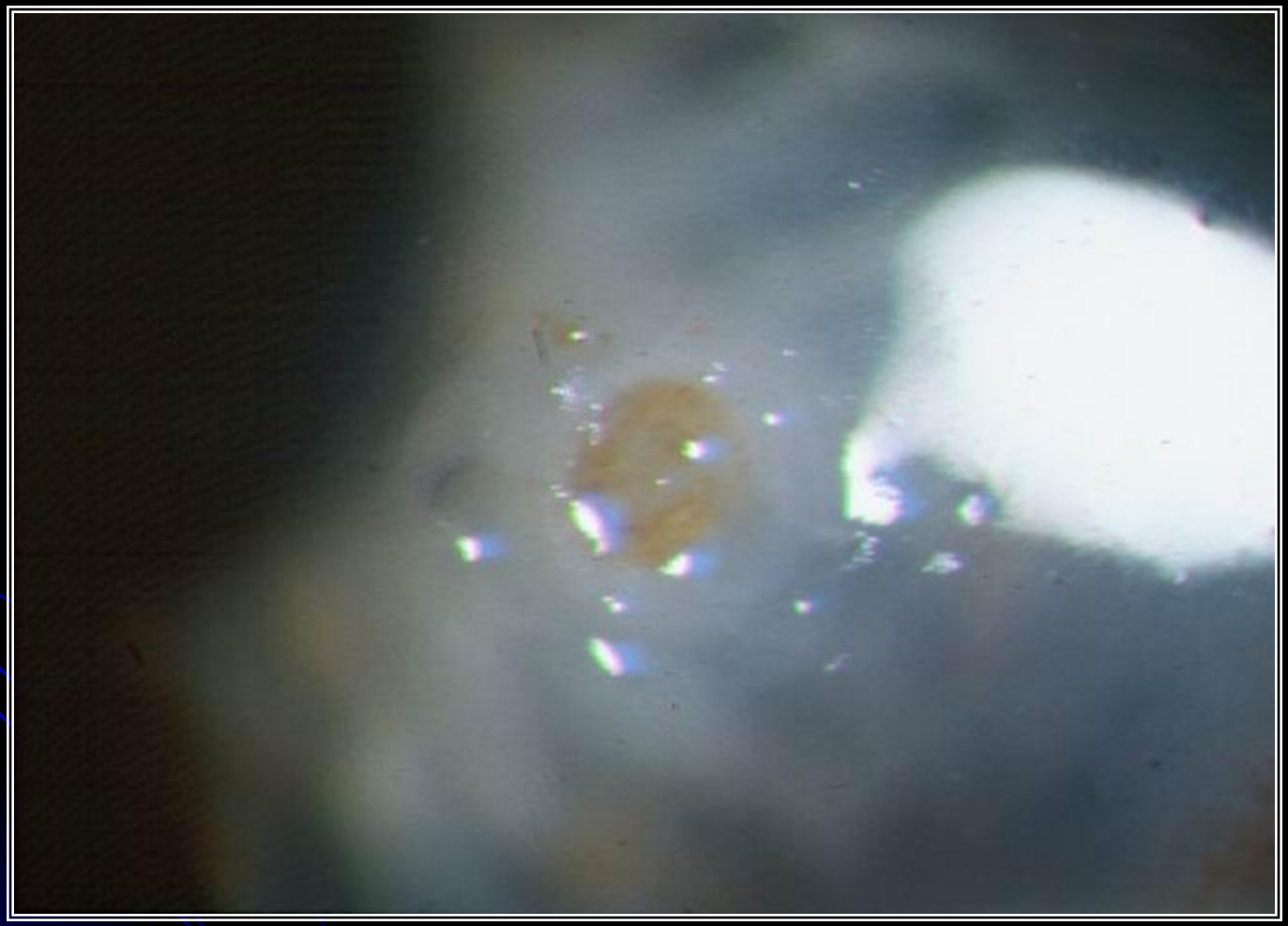
Now what?



Burr the rust!



Limit depth near the pupil



TO PATCH, OR NOT TO PATCH

Cumulative incidence of corneal healing

Probability of corneal healing	Patched N=82	Non-patched N=81
After 1 day	**0.51**	**0.60**
After 2 days	**0.78**	**0.83**
After 3 days	**0.92**	**0.98**

Le Sage, et al: Annals Emerg. Med. 38: 129-134, 2001

Right

Wrong

Never patch more than 12 hours

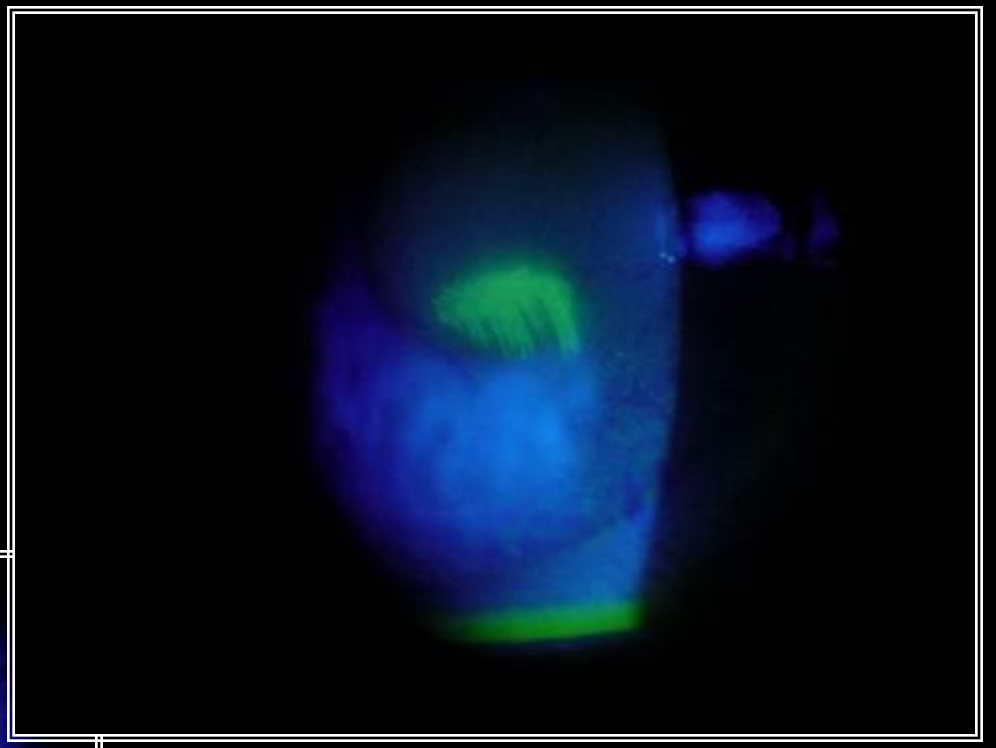
Use antibiotic ointment

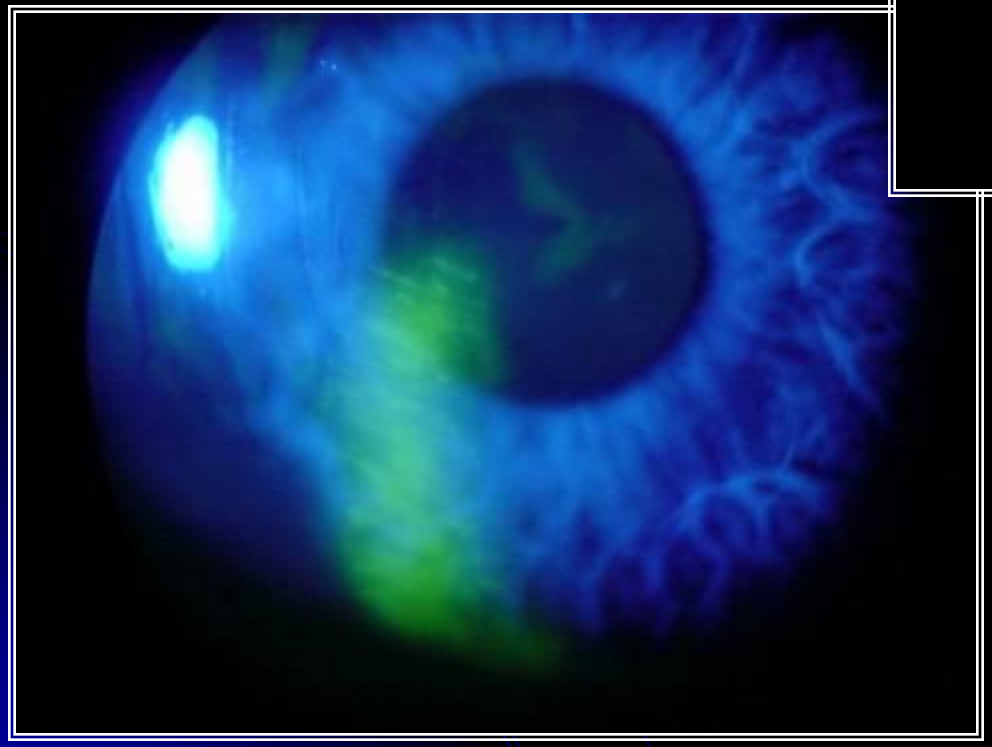
Semipressure patch

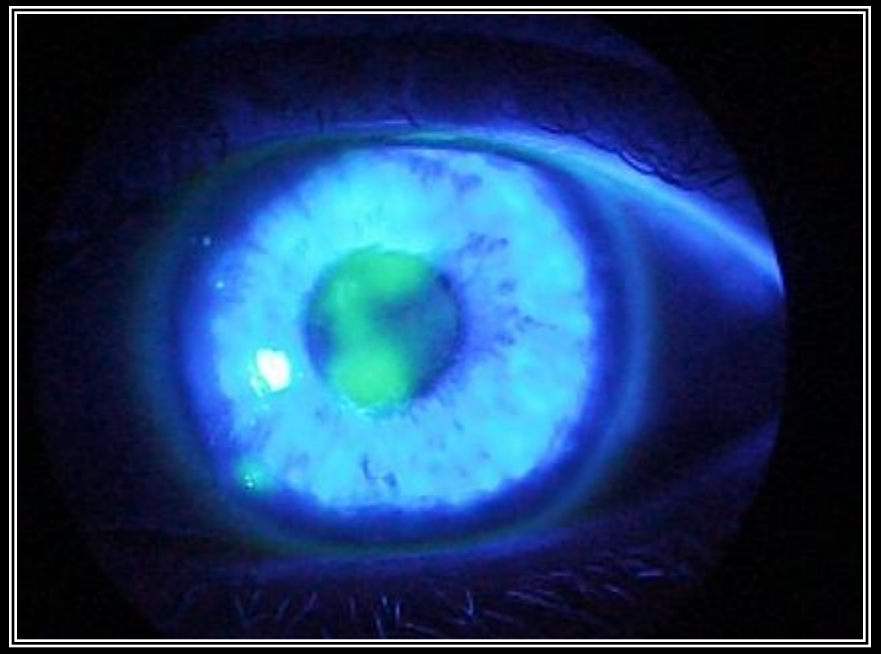
OCULAR TRAUMA

- Corneal abrasions

Fingernail damage

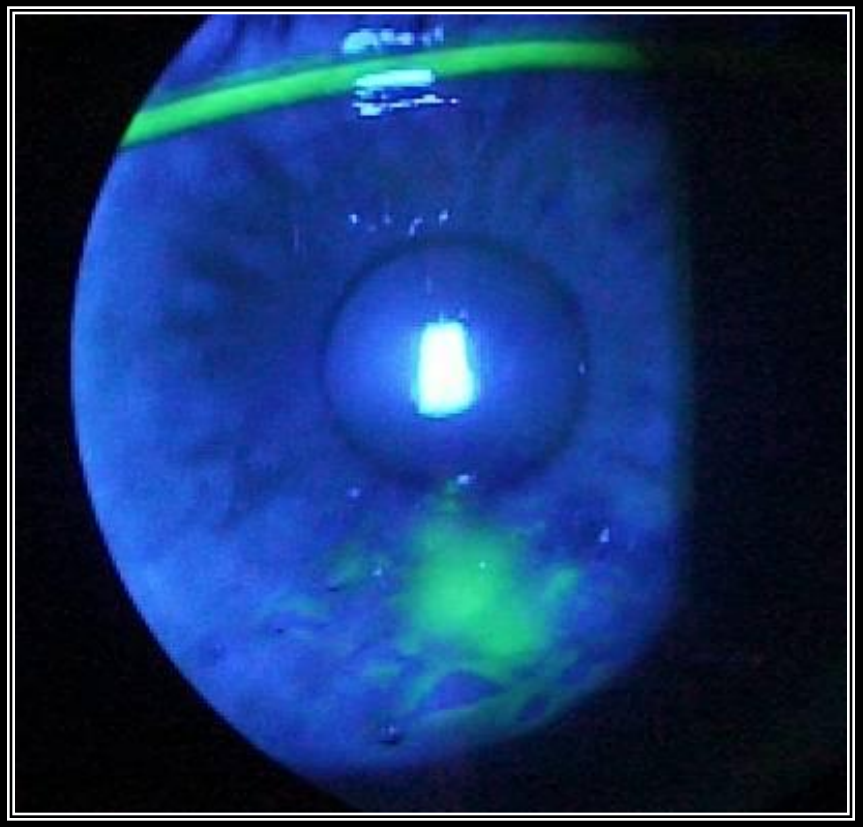






Cigarette burn

Curling iron



Airbag abrasions

OCULAR TRAUMA

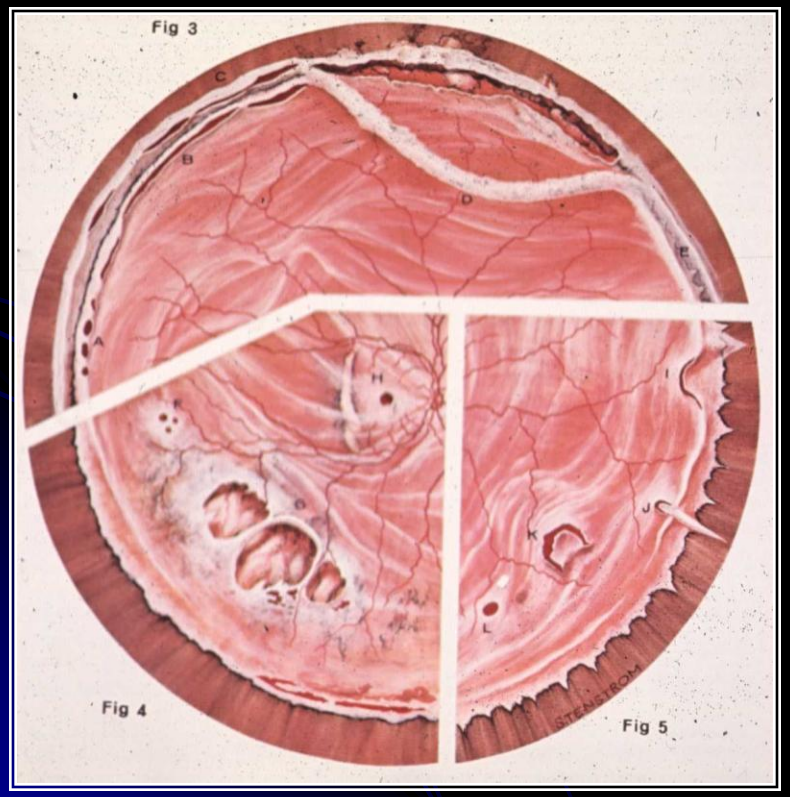
- Chemical burns

Treatment of chemical burns

- Start high volume BSS irrigation
- Sweep fornices for retained material
- Determine type of chemical (alkali worse than acid)
- Check pH (goal is 7.0)
- Call ophthalmologist

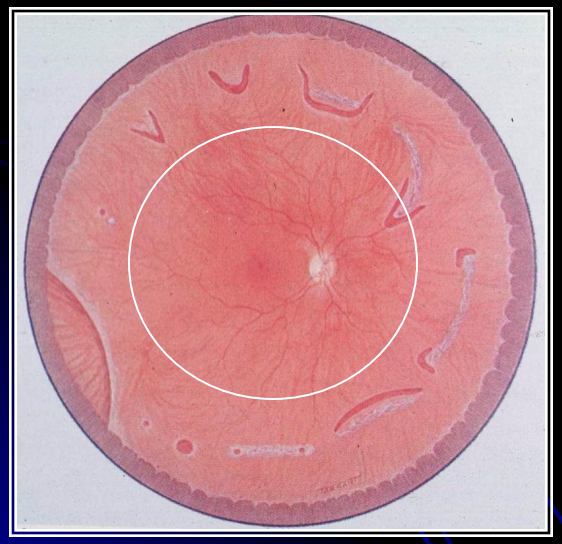
BLUNT TRAUMA

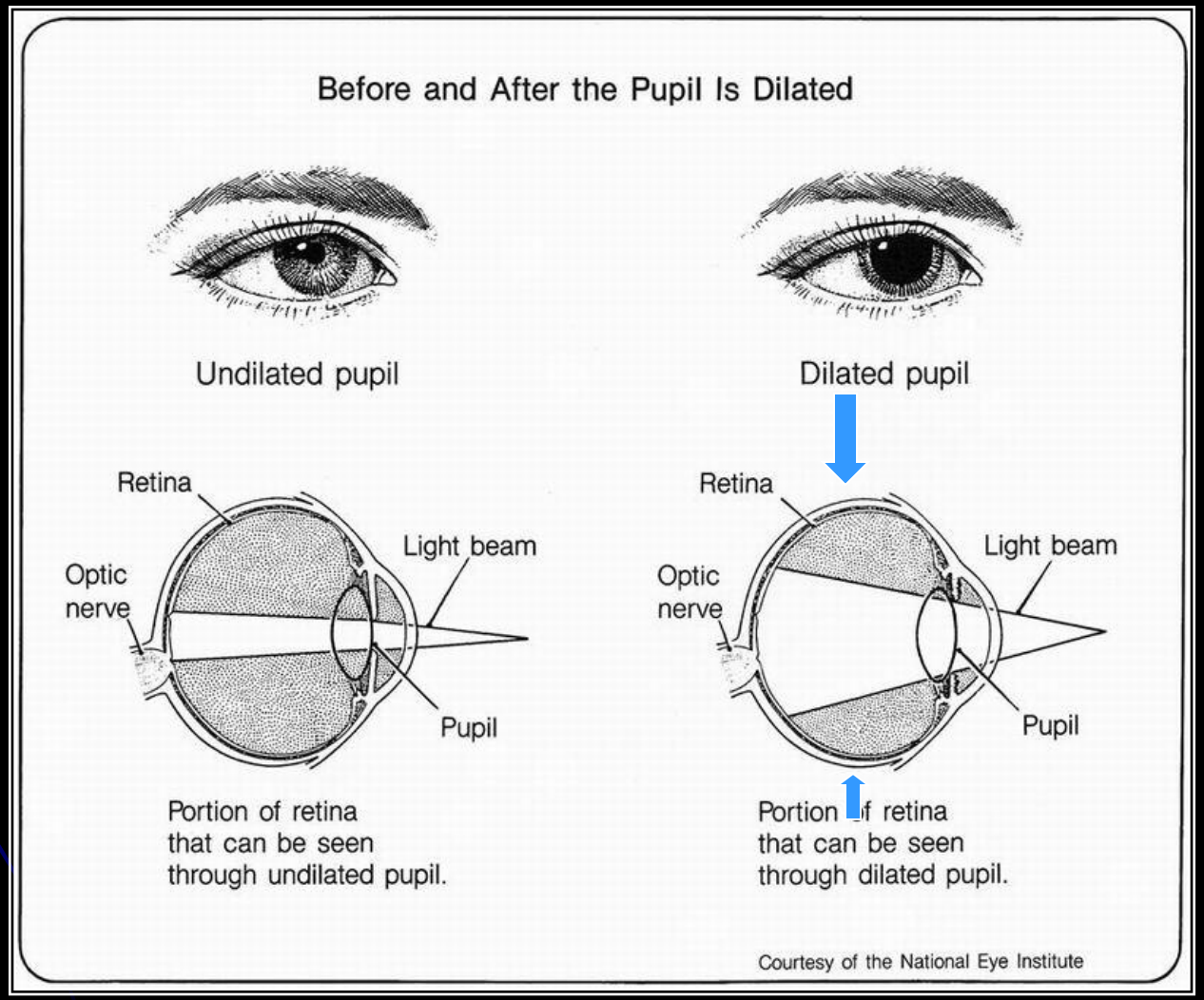
Retinal tears



RETINAL VISUALIZATION

Limited views



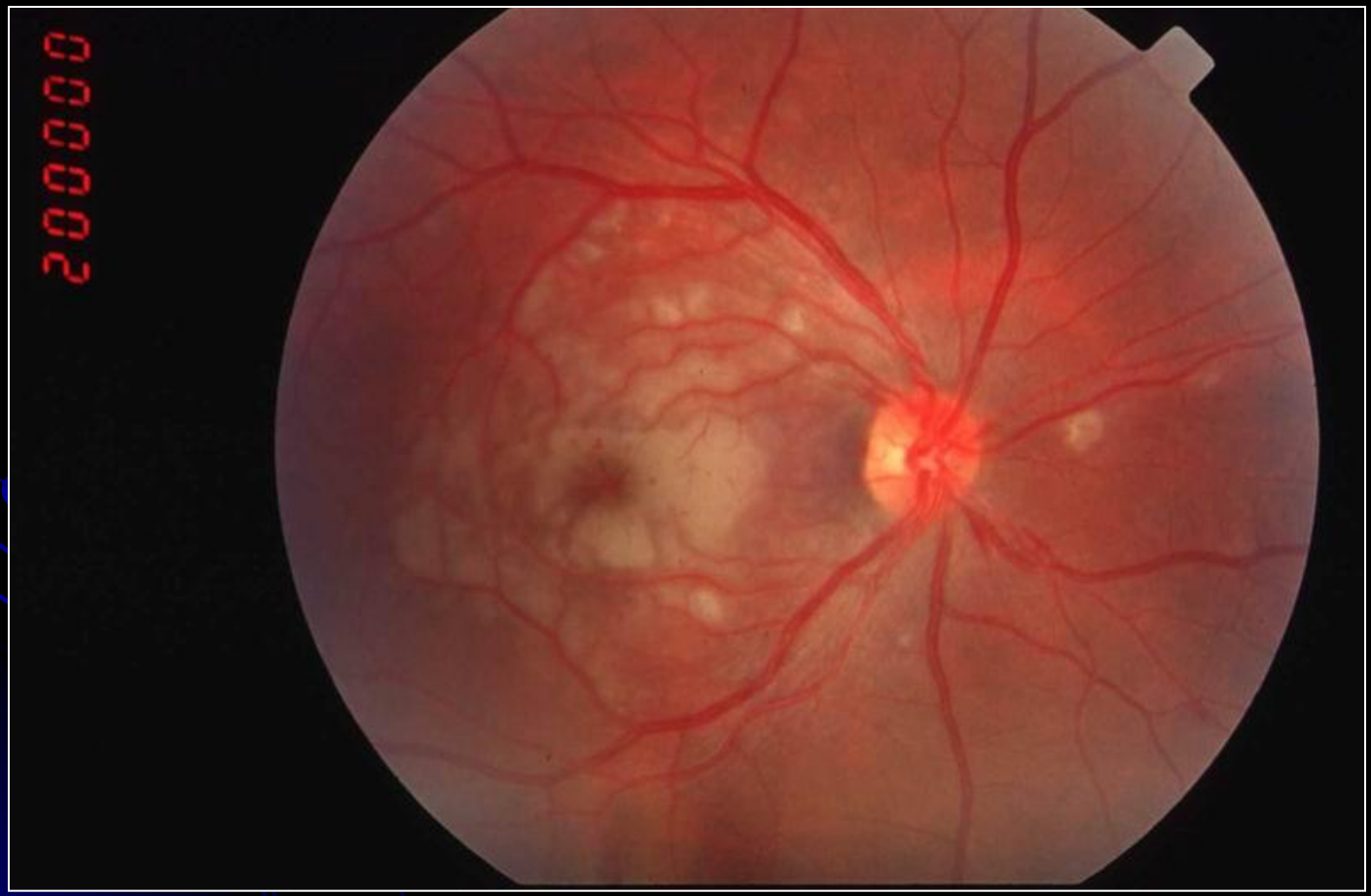


Delayed Diagnosis of Traumatic Retinal Detachments

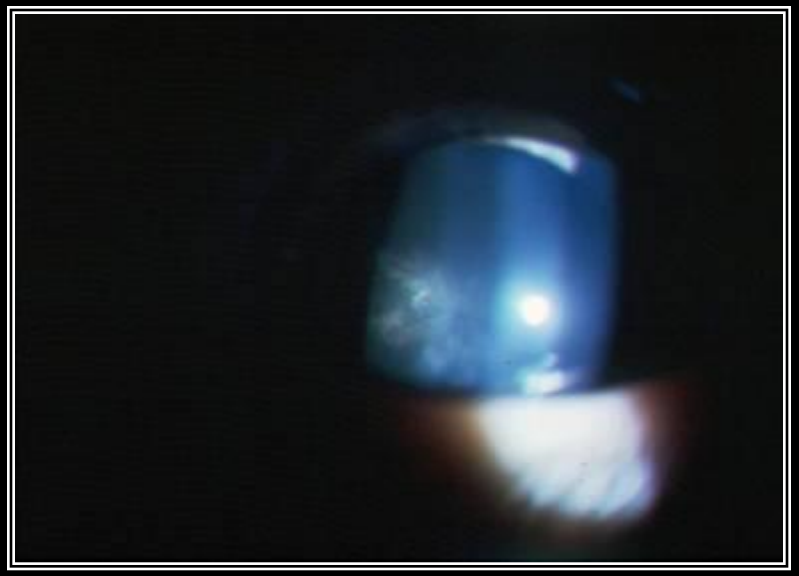
Interval between trauma and diagnosis	Cumulative percentage
Immediate	**12**
1 month	**30**
8 months	**50**
24 months	**80**

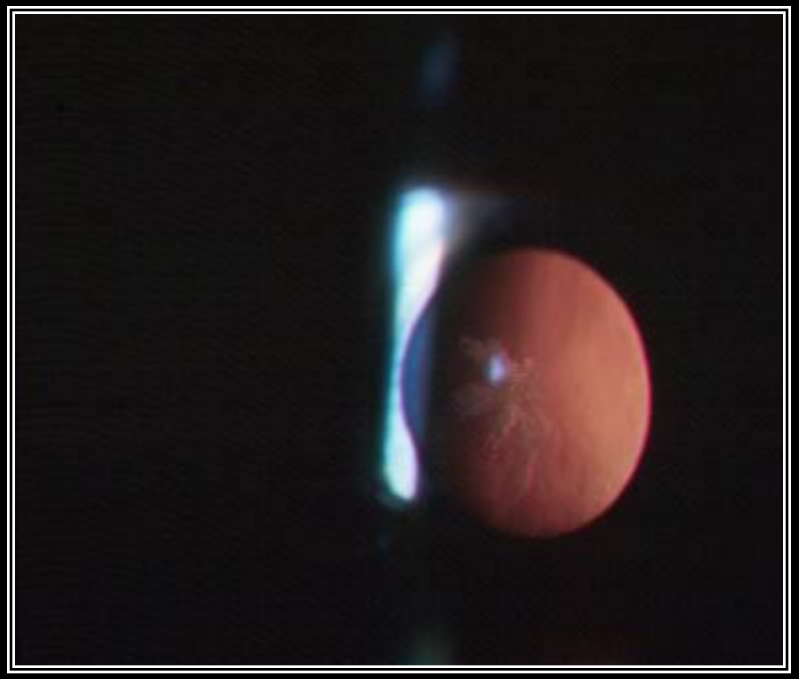
BLUNT TRAUMA

Retinal edema (commotio retinae)

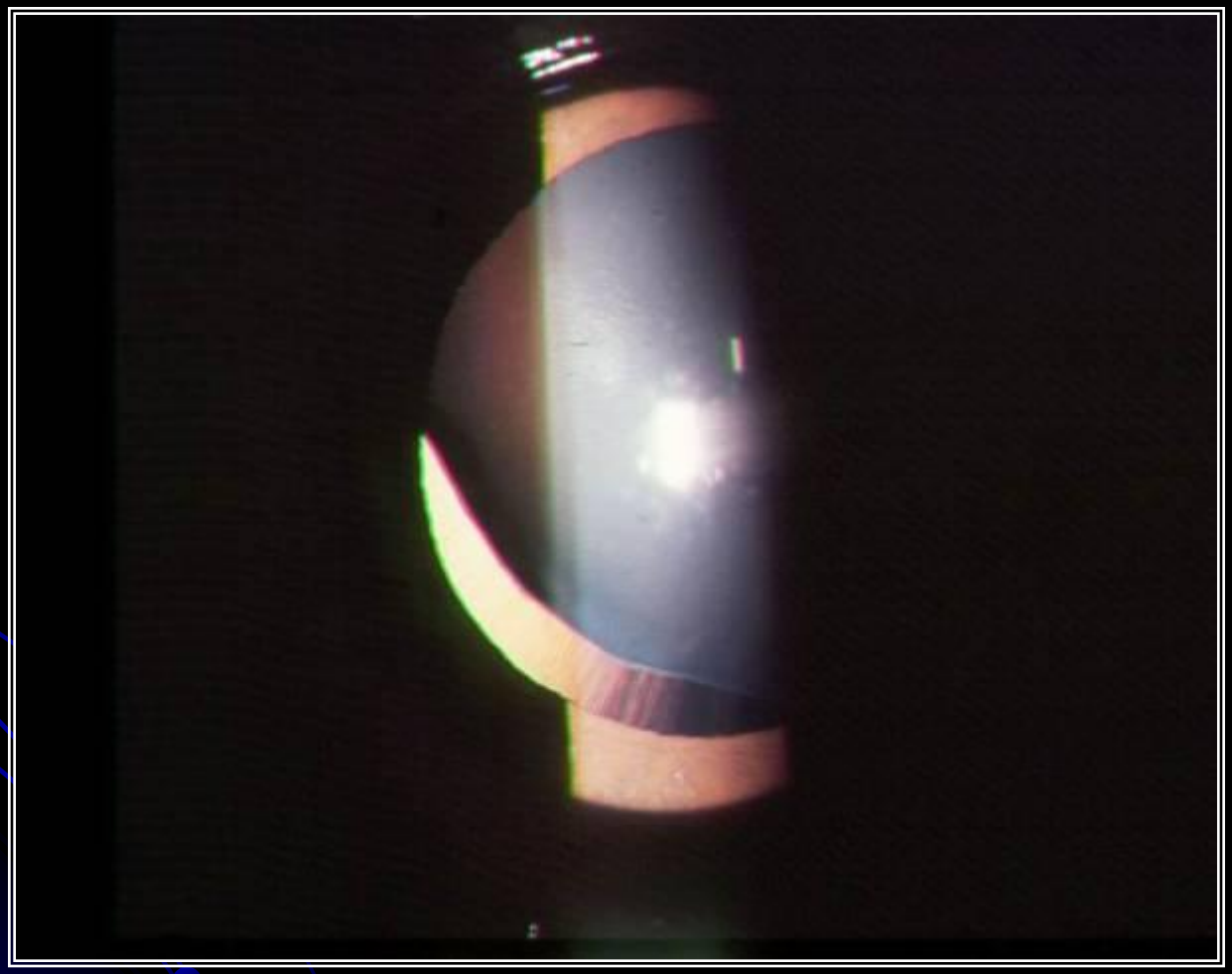


Traumatic cataracts





Ectopia lentis




THANK YOU