STATE BOARD OF OPTOMETRY
2450 DEL PASO ROAD, SUITE 105, SACRAMENTO, CA 95834
P (916) 575-7170 F (916) 575-7292 www.optometry .ca.gov

Continuing Education Course Approval Checklist

Title: Sports Related Eye Injuries

Provider Name: Dr. Jeong-Ah Kim

☑Completed Application
Open to all Optometrists? ☑Yes ☐No
Maintain Record Agreement? ☑Yes ☐No

☑Correct Application Fee

☑Detailed Course Summary

☑Detailed Course Outline

☑PowerPoint and/or other Presentation Materials

☐Advertising (optional)

☑CV for EACH Course Instructor

☑License Verification for Each Course Instructor
Disciplinary History? ☐Yes ☑No

BUSINESS, CONSUMER SERVICES, AND HOUSING AGENCY

GOVERNOR EDMUND G. BROWN JR.

CALIFORNIA STATE BOARD OF OPTOMETRY

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CONTINUING EDUCATION COURSE APPROVAL APPLICATION

$50 Mandatory Fee

$50 PAID

Pursuant to California Code of Regulations (CCR) § 1536, the Board will approve continuing education (CE) courses after receiving the applicable fee, the requested information below and it has been determined that the course meets criteria specified in CCR § 1536(g).

In addition to the information requested below, please attach a copy of the course schedule, a detailed course outline and presentation materials (e.g., PowerPoint presentation). Applications must be submitted 45 days prior to the course presentation date.

Please type or print clearly.

Course Title	**Course Presentation Date**
SPORTS RELATED EYE INJURIES	03/14/2017

Course Provider Contact Information

Provider Name

JEONG-AH (First) KIM (Last) _____ (Middle)

Provider Mailing Address

Street 27107 TOURNEY RD **City** SANTA ~~CLARITA~~ CLARITA **State** CA **Zip** 91355

Provider Email Address jenniferkim10@@hotmail.com

Will the proposed course be open to all California licensed optometrists?	☒ YES ☐ NO
Do you agree to maintain and furnish to the Board and/or attending licensee such records of course content and attendance as the Board requires, for a period of at least three years from the date of course presentation?	☒ YES ☐ NO

Course Instructor Information

Please provide the information below and attach the curriculum vitae for each instructor or lecturer involved in the course. If there are more instructors in the course, please provide the requested information on a separate sheet of paper.

Instructor Name

HOWARD (First) COHEN (Last) ~~MD~~ (Middle)

License Number 2009-00411 (North Carolina)	**License Type** MD.
Phone Number (____) _____	**Email Address** hcohen33@gmail.com

I declare under penalty of perjury under the laws of the State of California that all the information submitted on this form and on any accompanying attachments submitted is true and correct.

_____ 2-9-17

Signature of Course Provider ***Date***

Form CE-01, Rev. 5/16

27107 Tourney Road

Santa Clarita, CA 91355

February 9, 2017

CALIFORNIA BOARD OF OPTOMETRY
2450 Del Paso Road, Suite 105

Sacramento, CA 95834

To whom it may concern:

I am submitting a request for continuing education approval for the Kaiser Permanente Mammoth Ocular Symposium (3/12/17-3/14/17) less than the required 45 days because we have had a last minute cancellation from one of our speakers. Thus, Drs. Howard Cohen and Gary Groesbeck have volunteered to give lectures to replace the speaker who had to cancel.

Thank you so much for your understanding and my apologies for this unforeseeable change in our speakers.

If you need to contact me, please email me at jenniferkim100@hotmail.com or call me at 323-574-8957.

Sincerely,

Jeong-Ah Jennifer Kim, OD
CA Lic 11674TLG

27107 Tourney Road
Santa Clarita, CA 91355
March 4, 2017

State Board of Optometry
2450 Del Paso Road, Suite 105
Sacramento, CA 95834

To whom it may concern:

Thank you for your attention to the Kaiser Permanente Mammoth Ocular Symposium 2017 continuing education approval submission. In anticipation of receiving deficiency notifications for the other lectures, I have included a summary of each of the lectures and the respective powerpoint presentations.

There will be 7 lectures from 3/12/17-3/14/17:

The Retinal and Choroidal Dystrophies lecture is relevant to diagnosing and providing proper care as optometrists perform retinal exams on a regular basis. As optometrists continue to go toward medical aspects of eye care, this lecture will keep us well informed regarding various retinal conditions.

The Update on Cataract Surgery is relevant to optometrists because this is one of the most common referrals we make. It is important for optometrists to remain informed about advancements and changes to cataract surgeries so that we can properly educate our patients.

The Retinal White Dot Syndromes lecture is relevant in providing proper optometric care with respect to retinal diseases. Such retinal conditions may lead to discovering the underlying systemic condition giving rise to the specific white dot syndrome.

The Corneal Ectasias and Cross-Linking lecture provides information for conditions such as keratoconus and its treatment with cross-linking. Optometrists are often the first to diagnose keratoconus thus it's important that we know about various medical treatments, in addition to contact lenses and glasses.

The IOL Materials and Design lecture provides information regarding the details of lens implants for cataract patients. IOL materials and designs are topics that are commonly discussed between optometrists and their patients.

The Sports Injuries lecture is relevant as patients come into our clinics with various sports injuries sustained at school, sporting teams/clubs, and times of recreation. It is

important to anticipate and know what injuries can be sustained as optometrists provide a wide range of eye care.

The Benign Eyelid Lesions lecture provides information and visuals regarding eyelid lesions that optometrists observe daily. This will help to properly diagnose benign lesions and contrast those with lesions that need further work ups and/or referrals.

I apologize for submitting the lectures less than the 45 day request. I was waiting for all the presentations so that the lectures can be submitted together. The Benign Eyelid Lesions and Sports Injuries lectures were submitted less than the 45 request because there was a last minute cancellation of one of the original speakers, thus Drs. Groesbeck and Cohen prepared the presentations thereafter. In the future, an earlier deadline will be proposed so that the submissions will be on time.

I am attaching 2 checks that have already been deposited, one for $250 and the other for $100. All the files could not be sent in one email because the files were too large so there are 3 emails total which contain the required documents.

Thank you very much for your attention.

Sincerely,

Jeong-Ah Jennifer Kim, OD
CA Lic 11674TLG

- SPORTS RELATED EYE INJURIES
  HOWARD B. COHEN M.D.
- THREE AMIGOS
- Sports Related Eye Injuries
- CDC – 2.4 million eye related emergency room visits yearly between 2007 – 2010
- 38/10,000 were secondary to trauma
- 100,000 sports related eye injuries yearly. 42,000 requiring emergency care. 1 every 13 minutes.
- 13,500 result in permanent visual loss
- Leading cause of blindness in school age children
- 175 – 200 million in costs yearly
- 1/8 result in legal action
- Recreational Eye Injuries are a Major Public Health Concern
- SPORTS REALATED EYE INJURIES

1/8 with severe injuries and 1/20 with less severe injuries result in law suits

Document everything

Say nothing to incite

- Sports Related Eye Injuries
- Hurling ball 113Hoc mph
- Baseball 95 – 108 mph
- Badminton 140 mph
- Golf 210 mph
- Jai Alai 187 mph
- Squash 174 mph
- Tennis 163
- Soccer 130 mph
- Hockey puck 100 mph

- Sport Risk Categories
- HURLING
- HURLING
- Frequency of Eye Injuries by Sport and Age
  Based on a 1998 Sports and Recreational Eye Injury Study by Prevent Blindness America involving NEISS statistics related to 39,297 emergency room visits
- Basketball Eye Injuries
- Basketball represents the greatest risk for eye injury when compared to all other sports and has been shown to be the leading cause of sports eye injuries requiring emergency room treatment (22.2%)
- One in ten college basketball players will suffer an eye injury each season
- It is estimated that 6000 basketball players are legally blinded each year due to sports eye injuries
- Less serious basketball eye injuries are typically minor abrasions, lacerations, contusions, corneal abrasions and traumatic iritis caused by opponents fingers or elbows striking the players eye, frequently during aggressive play under the boards
- Avulsion of the optic nerve, usually due to the force transmitted by the extended finger, was most commonly reported in basketball than in any other sport
- Players that have had LASIK or incisional refractive surgery are at a greater risk due to the possibility of ruptured RK incisions or late LASIK flap dislocation
- Basketball represents the greatest risk for eye injury when compared to all other sports and has been shown to be the leading cause of sports eye injuries requiring emergency room treatment (32%)
- ASTM F803 protective eyewear certified for basketball is tested for the sport's specific injuries (including a finger poke test) and should be worn by all players
- Basketball Eye Injuries
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- Baseball and Softball
  Eye Injuries
- Baseball represents the greatest risk of sports eye injuries to players aged 5-14 years old
- Women's softball has approximately half the incidence of eye injury as men's baseball
- It is estimated that over 2,000 baseball players are legally blinded each year due to sports eye injuries

- Approximately 55% of baseball eye injuries are caused by ball impact among kids aged 5-14 years, with impact from a batted ball occurring 361% more often than a pitched ball
- Approximately two thirds of all baseball eye injuries occur in the field
- Baseball Stars Mookie Wilson and Jackie Gutierrez have suffered serious eye injuries due to the shattering of streetwear in the playing field
- ASTM F803 protective eyewear certified for baseball should be worn by all baseball and softball players in the field
- An ASTM F910 certified protective faceguard should be use by all baseball and softball batters
- Ice and Field Hockey
  Eye Injuries
- Hockey full face protectors worn by over 1.2 million North American ice hockey players has reduced eye and face injuries by approximately 70,000 and societal medical bills by approximately USD $10 million
- The widespread use of protective devises has virtually eliminated serious eye and face injuries to protected players
- Field hockey eye injuries tend to be severe and include ruptured globes from impact with the stick
- One in twenty-five field hockey players will experience an eye injury over an eight year career
- ASTM standard F513 face mask attached to the helmet should be worn by all ice hockey players
- ASTM standard F1587 face mask attached to the helmet should be worn by all ice hockey goalies
- ASTM F803 protective eyewear certified for women's lacrosse should be worn by all players
- Soccer Eye Injuries
- Soccer is the leading cause of sports eye injuries in Europe
- Approximately one in fifty soccer players will suffer an eye injury in the course of an eight year career
- Contrary to previous ophthalmology teaching that eye injuries are rarely caused by balls larger than 4" in diameter, the 8.6" diameter soccer ball is responsible for approximately 80% of soccer eye injuries. The risk of ball related eye injury drops to approximately 66.6% for experienced (older) players.
- Because of its deformative characteristics (i.e. softness), on impact the soccer ball can remain in the eye orbit longer than any other sports ball
- Soccer eye injuries can be serious (hyphema, vitreous hemorrhage, retinal tear, chorioretinal rupture, angle recession) as well as minor (corneal abrasions and contusions)
- ASTM F803 protective eyewear (certified for any sport) should be worn by all soccer players

- Due to the absence of proper techniques necessary to protect the brain and retina, heading should be discouraged for younger players
- Soccer Eye Injuries
- Soccer Eye Injuries
- Soccer Eye Injuries
- SOCCER INJURIES
- Football and Lacrosse
  Eye Injuries
- The average football team will experience four eye injuries each season, and one severe eye injury every two seasons
- Although single and double bar facemasks have reduced facial injuries in football by approximately 80-90%, facial injuries continue to represent approximately 10% of all football injuries
- All presently available football helmets allow penetration of a finger through facemasks that are not supplemented with a polycarbonate visor, with enough force to result in retinal detachment or visual loss to the injured eye
- Prior to the mandating of protective eyewear, eye injuries occurred fifteen times more frequently in women's lacrosse than in men's lacrosse
- Fractured orbits, hyphema, angle recession with lifelong tendency to glaucoma and ocular contusions are historically the most common injuries in women's lacrosse
- Polycarbonate shields should be encouraged for all football players
- NOCSAE facemask attached to the helmet is mandated for all men's lacrosse players
- ASTM standard F803 certified for women's lacrosse is mandated by the International Federation of Women's Lacrosse Associations
- Racket Sports Eye Injuries
- In a Canadian study, racket sports accounted for 24.5% of all reported eye injuries and 8.8% of all eyes blinded by sports
- In a US study, racket sports were responsible for 40.3% of sports eye injuries seen in a private practice, and 23% of all admissions for Hyphema to the Massachusetts Ear and Eye Infirmary
- In a survey conducted by the American Amateur Racquetball Association, 61% of members and 77% of former officials thought that eye protection should be mandated for the sport
- A study in Massachusetts showed that tennis was the leading cause of eye injuries in west-suburban-Boston working aged women

- The majority of racket sport eye injuries are related to impact with the ball, followed by impact with another player's racket (in doubles sports)
- Despite the availability of ASTM and CSA certification standards, some major manufacturers continue to promote unsafe eyewear for use in racket sports
- ASTM F803 or CSA P400 protective eyewear certified for the specific racquet sport should be worn by all players
- Immediate Referral
- Sudden decrease or loss of vision
- Loss of field of vision
- Pain of eye movement
- Photophobia
- Diplopia
- Flashes and / or floaters
- Irregular pupil
- Immediate Referral
- Foreign body sensation
- Red inflamed eye
- Hyphema
- Halos around lights
- Laceration of lid margin or medial canthus
- Chemosis
- Broken contact or shattered glasses
- Immediate Referal
- Suspected globe perforation
- Litigenous patient or parents
- CONJUCTIVA
- Abrasion
- Laceration
- Subconjuctival hemorrhage
- Chemosis

- All of the above
- HYPHEMA
- Most hyphema are microscopic with only 50% forming a layer.
- 40% have a clot adherant to the iris stroma.
- 10% have a clot in contact with the endothelium. Increased risk of corneal blood staining.
- Most common site of bleeding is the anterior aspect of the ciliary body (71%)
- Duration of uncomplicated hyphema is usually 5 - 6 days
- HYPHEMA
- GRADE 1 - BLOOD OCCUPYING LESS THEN ONE THIRD OF ANTERIOR CHAMBER. 58%
- GRADE 2 - BLOOD OCCUPYING ONE THIRD TO ONE HALF OF ANTERIOR CHAMBER. 20%
- GRADE 3 - BLOOD FILLING ONE HALF TO LESS THAN TOTAL OF ANTERIOR CHAMBER. 14%
- GRADE 4 - TOTAL CLOTTED BLOOD (8 BALL). 8%
- Hyphema Grading
- HYPHEMA COMPLICATIONS
- Rebleeding
- Glaucoma
- Posterior synechiae
- Peripheral anterior synechiae
- Corneal bloodstaining
- HYPHEMA
- REBLEEDING SIGNIFICANTLY WORSENS THE PROGNOSIS.
- 64% OF PATIENTS WITH REBLEED HAVE 20/50 OR BETTER VISION COMPARED WITH 80% OF PATIENTS WITHOUT REBLEED.
- REBLEEDS OCCURS IN 25% OF ALL HYPHEMAS (7 - 38%).
- HIGHER INCIDENCE IN GRADES 3 AND 4.
- MOST OFTEN BETWEEN DAYS 3 - 4 (RANGE 2 - 7 DAYS).
- 33% OF CHILDREN YOUNGER THAN 6.
- MORE FREQUENT IN AFRICAN AMERICANS 24.2% VS 4.5%

- HYPHEMA - INCREASED IOP
- IOP MAY OCCUR IN HYPHEMAS OF ANY SIZE.
- INCREASED IOP > 22 OCCURS IN 32%.
- HIGHER ELEVATIONS OF IOP ARE MORE COMMONLY ASSOCIATED WITH NEAR TOTAL OR TOTAL HYPEMAS.
- PATIENTS PREDISPOSED TO GLAUCOMA OR HAVE GLAUCOMA HAVE A HIGHER INCIDENCE.

- HYPHEMA COMPLICATIONS ANTERIOR SYNECHIAE
- Peripheral anterior synechiae develop in medically treated patients in whom the blood has remained for a prolonged period of time. Most often longer then 9 days.
- Anterior synechiae result from inflammation secondary to the initial trauma and /or chemical iritis from blood in the anterior chamber.
- HYPHEMA COMPLICATIONS POSTERIOR SYNECHIAE
- Posterior synechiae develop secondary to iritis or iridocyclitis. Occur rarely in medically treated patients.
- HYPHEMA -CORNEAL BLOODSTAINING
- Status of endothelium
- Large clot in contact with endothelium.
- Grade 3 or 4 with elevated intraocular pressure for at least 6 days.
- May occur with lower IOP or higher IOP over a shorter period of time.
- Starts centrally and spreads peripherally.
- Clears over weeks to months. Clearing starts peripherally.
- HYPHEMA - PROGNOSIS
- Overall 75% maintain good vision.
- 80% with grade 1 regain visual acuity of 20/40 or better.
- Depends on whether there are other associated injuries.
- 60% with grade 3 regain visual acuity of 20/40 or better.
- 35% with grade 4 regain visual acuity of 20/40 or better.
- Poor visual acuity related directly to hyphema 11%
- HYPHEMA - TREATMENT

- Hospitalization vs nonhospitalization
- Topical steroids
- Cycloplegics
- Antifibrinolytic agents - aminocaproic acid (aca), tranexamic acid (txa)
- Systemic steroids
- Patching
- Restricted activity
- Patient specific
- Yasuna no touch
- High Risk Factors Rebleed
- Sickle-cell trait or anemia
- Secondary hemorrhage
- Penetrating ocular trauma
- Suspected child abuse
- Grade III or IV hyphema
- Noncompliant patients
- Intractable glaucoma
- Indications for Surgery
- Microscopic corneal blood staining
- In sickle-cell trait or sickle-cell disease, hyphema of any size and IOP > 24 Hg for more than 24 hours
- Hyphema >1/2 of the anterior chamber for >8 days(to prevent peripheral anterior synechiae)
- Total hyphema with IOP of >50 mm Hg for 4 days(to prevent optic atrophy)
- Total hyphema or >3/4 of anterior chamber volume present for 6 days with IOP of >25 mm Hg (to prevent corneal blood staining)
- Indications for Surgery
- IOP greater than 60 mm Hg for 2 days (to prevent optic atrophy).
- IOP greater than 24 mm Hg over the first 24 hours or if repeated IOP spikes more than 30 mm Hg in sickle-cell disease or trait.
- IOP greater than 25mmHg with a total hyphema for 5 days(to prevent corneal blood staining).

- Microscopic corneal blood staining.
- The hyphema fails to resolve to less than 50% of the anterior chamber volume by 8 days (to prevent peripheral anterior synechiae formation).
- Pearls in Management of Hyphema
- All patients of hyphema should be evaluated in detail for systemic injuries and retained IOFB
- Absolute bed rest and hospitalization is not mandatory
- Topical steroids and cycloplegics are used frequently for initial control of inflammation and rebleeds
- Beta blockers and prostaglandin analogues should be used to control IOP
- Avoid carbonic anhydrase inhibitors, alpha agonists and hyperosmotics in sickle-cell disease/trait
- Most aggressive treatment is needed to prevent optic nerve damage
- Recurrent hemorrhage can occur 2e7 days after trauma
- Regular ophthalmic evaluation is required in patients with angle recession >180
- NORMAL ANGLE
- Angle Recession
- Less than 20% develop glaucoma
- < 180 degrees unusual to develop glaucoma
- > 180 degrees 4 - 9%
- > 240 degrees highest risk
- All races affected equally
- CORNEAL ABRASION
- CORNEAL ABRASION
- CORNEAL ABRASION
- CORNEAL ABRASION TREATMENT
- Topical antibiotics
- Cycloplegics
- Topical steroids
- Patch
- No patch

- Soft contact lens
- Shield
- CORNEAL LACERATION
- LENS TRAUMA
- LENS TRAUMA
- ANTERIOR DISLOCATION
- POSTERIOR DISLOCATION
- TRAUMATIC CATARACT
- TRAUMATIC CATARACT
- Cataracts that are not subluxated and with intact capsule - IOL
- Subluxation , dislocated, ruptured capsule - vitrectomy and lensectomy
- Secondary sutured IOL in cases requiring lensectomy
- VITREOUS HEMORRHAGE
- VITREOUS HEMORRHAGE
- Vitrectomy indicated for nonclearing hemorrhages
- Prompt vitrectomy for hemorrhages associated with retinal detachment , uncontrolled ghost cell glaucoma, ruptured lens , vitreous traction threatening macula
- Laser for some cases of subhyloid hemorrhage
- GHOST CELL GLAUCOMA
- Anti glaucoma medication
- Anterior chamber washout
- Vitrectomy
- Continue anti glaucoma medications after removal of ghost cells.
- RETINAL DETACHMENT
-
- RETINAL DETACHMENT
- Pneumatic retinopexy
- Scleral buckle
- Vitrectomy

l COMMOTIO RETINA

l Commotio Retina

l Extra cellular edema, glial swelling, photoreceptor outer segment swelling.

l When macula affected may have cherry red spot or yellow color. Sometimes called Berlins edema.

l Prognosis most often good. Resolves in 3 – 4 weeks.

l Complications can include macular hole, choroidal rupture, retinal pigment dysfunction and vision less then 20/200.

l No proven acute treatment

l TRAUMATIC MACULAR HOLE

l TRAUMATIC MACULAR HOLE

l MACUALR HOLE

l Vitrectomy

l Gas bubble and face down

l Silicone oil

l CHOROIDAL RUPTURE

l OPTIC NERVE INJURY

l Decreased central acuity, blurry vision, scotomas

l Decreased color vision

l Afferent pupillary defect

l Visual field defect

l Normal appearance initially with atrophy developing in 3 – 6 weeks

l OPTIC NERVE INJURY

l OPTIC NERVE INJURY

l OPTIC NERVE INJURY

l OPTIC NERVE INJURY

l The treatment of traumatic optic neuropathy: the

International optic nerve trauma study

Ophthalmology ; 2000 may 107(5) : 814

" No clear benefit was found for either corticosteroid

Therapy or optic canal decompression surgery.

These results and the existing literature provide

sufficient evidence to conclude that neither...should

Be considered the standard of care...reasonable to decide

Treat or not treat on an individual patient basis."

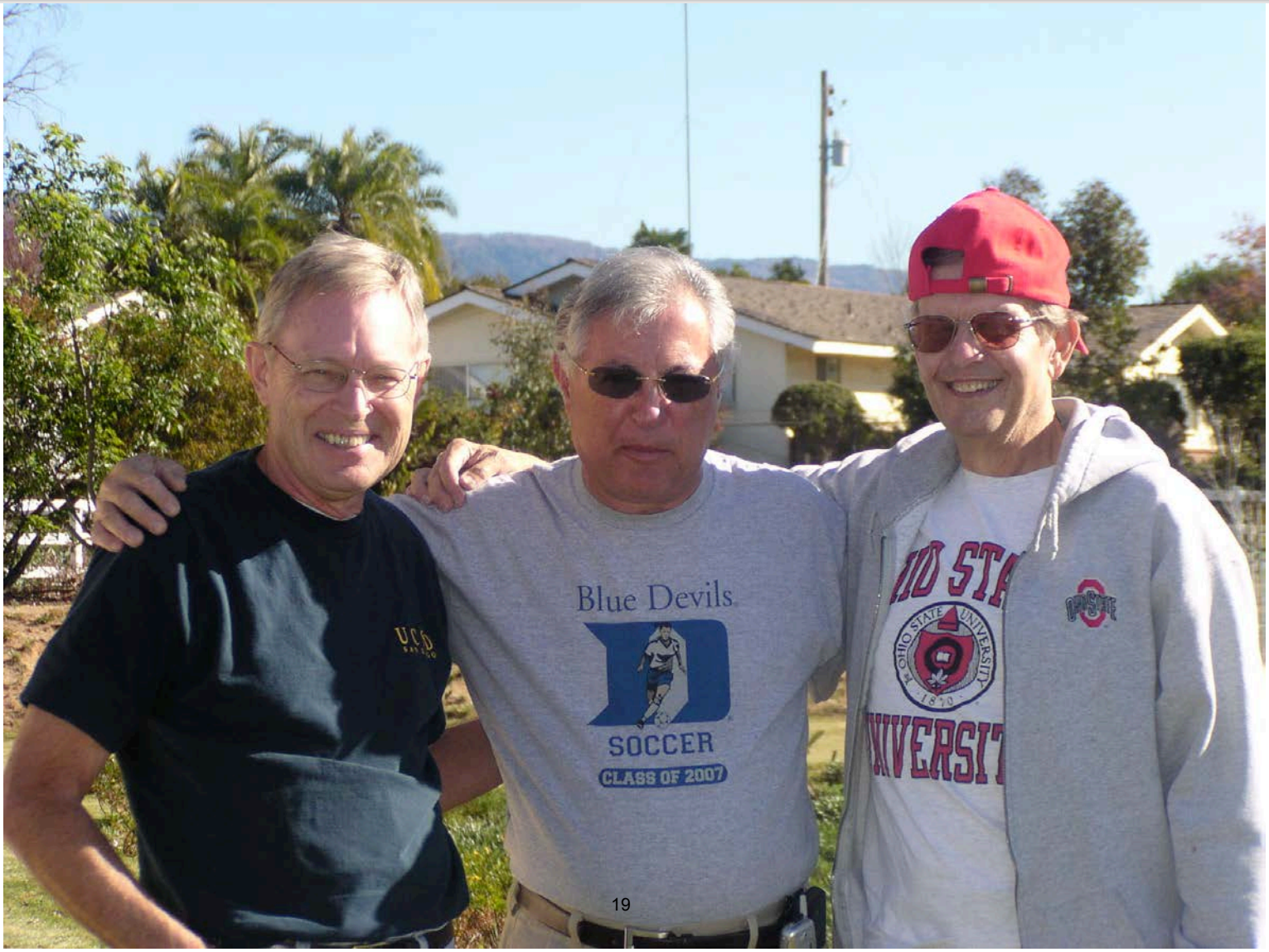
- Optic Nerve Injury
- 2016 update of results of International optic nerve trauma study are unchanged.
- In addition steroids should not be in cases with concomitant traumatic brain injury or after 8 hours after injury.
- RUPTURED GLOBE
- ORBITAL FLOOR FRACTURE
- FLOOR FRACTURE
- MEDIAL WALL FRACTURE
- ROOF FRACTURE
- ORBITAL FLOOR FRACTURE
- Critical Lens Materials: Polycarbonate or Trivex
- **Polycarbonate 2.0**
  - 21 x stronger than CR 39 (standard ophthalmic plastic lens material) on impact with a 1/8" missile
  - 100 x stronger than CR 39 on impact with a 1" missile
  - Compulsory ballistic testing for Polycarbonate 2.0 includes impact with a ¼" missile fired at 150 feet/second
- Photochromic lenses in Polycarbonate or Trivex are an excellent choice for indoor/outdoor sports

Risks to the One-Eyed Athlete

- Eye injuries are the leading cause of monocular blindness

- The one-eyed athlete is 150 times more likely to go completely blind than an athlete with two fully functioning eyes
- Protective eyewear should be mandated for all one-eyed athletes participating in risk-prone sports

SPORTS RELATED EYE INJURIES
HOWARD B. COHEN M.D.


Blue Devils
SOCCER
CLASS OF 2007
OHIO STATE UNIVERSITY
1870

Sports Related Eye Injuries

- CDC – 2.4 million eye related emergency room visits yearly between 2007 – 2010
- 38/10,000 were secondary to trauma
- 100,000 sports related eye injuries yearly. 42,000 requiring emergency care. 1 every 13 minutes.
- 13,500 result in permanent visual loss
- Leading cause of blindness in school age children
- 175 – 200 million in costs yearly
- 1/8 result in legal action

Recreational Eye Injuries are a Major Public Health Concern

FREQUENT

- More than 600,000 eye injuries related to sports and recreation occur each year[1]
- 42,000 of these injuries are of a severity that requires Emergency Room attention[2]
- It is estimated that approximately 13,500 legally blinding sports eye injuries occur each year
- One-in-eighteen college athletes will sustain an eye injury each season. The odds increase to one-in-ten for basketball players[7]

SEVERE

- Eye injury is the leading cause of visual impairment in one eye
- Sports participants using “street wear” (corrective eyewear or sunwear that does not conform to ASTM certified protective standards) are at a far more severe risk of eye injury than participants using no eye protection at all[4]
- The one-eyed athlete is 150 times more likely to go completely blind than an athlete with two fully functioning eyes.

PREVENTABLE

- More than 90% of all eye injuries can be prevented with the use of appropriate protective eyewear[3]
- According to the 2002 National Health Interview Survey, 84.6% of children do not utilize protective eyewear in situations that represent a risk of eye injury

SPORTS REALATED EYE INJURIES

1/8 with severe injuries and 1/20 with less severe injuries result in law suits

Document everything

Say nothing to incite

Sports Related Eye Injuries

- Hurling ball 113Hoc mph
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- Badminton 140 mph
- Golf 210 mph
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- Squash 174 mph
- Tennis 163
- Soccer 130 mph
- Hockey puck 100 mph

Sport Risk Categories

High Risk	**Small/Fast Projectiles:** Air Rifle, BB Gun, Paintball **Hard Projectiles, "Sticks", Close Contact:** Basketball, Field Hockey, Ice Hockey, Lacrosse, Racquetball, Baseball, Softball, Squash, Wrestling, Fencing, Cricket **Intentional Injury:** Boxing, Full Contact Martial Arts
Moderate Risk	Soccer, Football, Tennis, Volleyball, Fishing, Golf, Pool Activities, Badminton
Low Risk	Diving, Skiing (snow and water), Non-contact Martial Arts, Bicycling
Eye Safe	Track & Field, Gymnastics


O'NEILL

Frequency of Eye Injuries by Sport and Age

Based on a 1998 Sports and Recreational Eye Injury Study by Prevent Blindness America involving NEISS statistics related to 39,297 emergency room visits

	Total Estimated Injuries	Under 5 Years Old	5-14 Years Old	15-24 Years Old	Over 24 Years Old
Basketball	22.2%	1.7%	26.8%	44.2%	27.3%
Swimming and Pool Sports	11.7%	2.9%	38.8%	15.2%	39.6%
Baseball	10.3%	4.5%	54.5%	20.4%	20.6%
Racquet and Court Sports	7.0%	0.0%	36.1%	33.5%	29.7%
Hockey	4.1%	0.0%	31.9%	38.9%	29.2%
Football	3.7%	0.0%	36.4%	39.8%	23.8%
Soccer	3.4%	0.0%	55.9%	28.5%	15.5%
Ball Sports	3.2%	9.1%	45.7%	29.5%	12.6%
Golf	2.1%	0.8%	17.1%	9.1%	72.9%
Combatives	1.1%	0.0%	12.5%	18.3%	69.2%
Select Sport Total	68.9%	2.2%	36.5%	31.1%	30.2%
Other Sports	31.1%	11.9%	28.5%	24.3%	35.3%
Total	100.0%	5.2%	34.0%	29.0%	31.8%

Basketball Eye Injuries

- Basketball represents the greatest risk for eye injury when compared to all other sports and has been shown to be the leading cause of sports eye injuries requiring emergency room treatment (22.2%)
- One in ten college basketball players will suffer an eye injury each season
- It is estimated that 6000 basketball players are legally blinded each year due to sports eye injuries
- Less serious basketball eye injuries are typically minor abrasions, lacerations, contusions, corneal abrasions and traumatic iritis caused by opponents fingers or elbows striking the players eye, frequently during aggressive play under the boards
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- ASTM F803 protective eyewear certified for basketball is tested for the sport's specific injuries (including a finger poke test) and should be worn by all players


4
PERS
TEAM
31

Baseball and Softball Eye Injuries

- Baseball represents the greatest risk of sports eye injuries to players aged 5-14 years old
- Women's softball has approximately half the incidence of eye injury as men's baseball
- It is estimated that over 2,000 baseball players are legally blinded each year due to sports eye injuries
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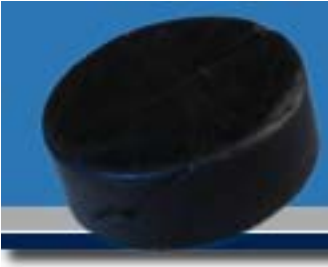
- ASTM F803 protective eyewear certified for baseball should be worn by all baseball and softball players in the field
- An ASTM F910 certified protective faceguard should be use by all baseball and softball batters


AP

Ice and Field Hockey Eye Injuries



- Hockey full face protectors worn by over 1.2 million North American ice hockey players has reduced eye and face injuries by approximately 70,000 and societal medical bills by approximately USD $10 million
- The widespread use of protective devises has virtually eliminated serious eye and face injuries to protected players
- Field hockey eye injuries tend to be severe and include ruptured globes from impact with the stick
- One in twenty-five field hockey players will experience an eye injury over an eight year career
- ASTM standard F513 face mask attached to the helmet should be worn by all ice hockey players
- ASTM standard F1587 face mask attached to the helmet should be worn by all ice hockey goalies
- ASTM F803 protective eyewear certified for women's lacrosse should be worn by all players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Soccer Eye Injuries

- Soccer is the leading cause of sports eye injuries in Europe
- Approximately one in fifty soccer players will suffer an eye injury in the course of an eight year career
- Contrary to previous ophthalmology teaching that eye injuries are rarely caused by balls larger than 4” in diameter, the 8.6” diameter soccer ball is responsible for approximately 80% of soccer eye injuries. The risk of ball related eye injury drops to approximately 66.6% for experienced (older) players.
- Because of its deformative characteristics (i.e. softness), on impact the soccer ball can remain in the eye orbit longer than any other sports ball
- Soccer eye injuries can be serious (hyphema, vitreous hemorrhage, retinal tear, chorioretinal rupture, angle recession) as well as minor (corneal abrasions and contusions)
- ASTM F803 protective eyewear (certified for any sport) should be worn by all soccer players
- Due to the absence of proper techniques necessary to protect the brain and retina, heading should be discouraged for younger players


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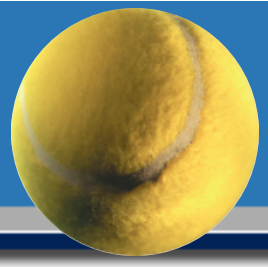
Football and Lacrosse Eye Injuries

- The average football team will experience four eye injuries each season, and one severe eye injury every two seasons
- Although single and double bar facemasks have reduced facial injuries in football by approximately 80-90%, facial injuries continue to represent approximately 10% of all football injuries
- All presently available football helmets allow penetration of a finger through facemasks that are not supplemented with a polycarbonate visor, with enough force to result in retinal detachment or visual loss to the injured eye
- Prior to the mandating of protective eyewear, eye injuries occurred fifteen times more frequently in women's lacrosse than in men's lacrosse
- Fractured orbits, hyphema, angle recession with lifelong tendency to glaucoma and ocular contusions are historically the most common injuries in women's lacrosse
- Polycarbonate shields should be encouraged for all football players
- NOCSAE facemask attached to the helmet is mandated for all men's lacrosse players
- ASTM standard F803 certified for women's lacrosse is mandated by the International Federation of Women's Lacrosse Associations

Racket Sports Eye Injuries



- In a Canadian study, racket sports accounted for 24.5% of all reported eye injuries and 8.8% of all eyes blinded by sports
- In a US study, racket sports were responsible for 40.3% of sports eye injuries seen in a private practice, and 23% of all admissions for Hyphema to the Massachusetts Ear and Eye Infirmary
- In a survey conducted by the American Amateur Racquetball Association, 61% of members and 77% of former officials thought that eye protection should be mandated for the sport
- A study in Massachusetts showed that tennis was the leading cause of eye injuries in west-suburban-Boston working aged women
- The majority of racket sport eye injuries are related to impact with the ball, followed by impact with another player's racket (in doubles sports)
- Despite the availability of ASTM and CSA certification standards, some major manufacturers continue to promote unsafe eyewear for use in racket sports
- ASTM F803 or CSA P400 protective eyewear certified for the specific racquet sport should be worn by all players

Toby Melville / AFP file

Immediate Referral

- Sudden decrease or loss of vision
- Loss of field of vision
- Pain of eye movement
- Photophobia
- Diplopia
- Flashes and / or floaters
- Irregular pupil

Immediate Referral

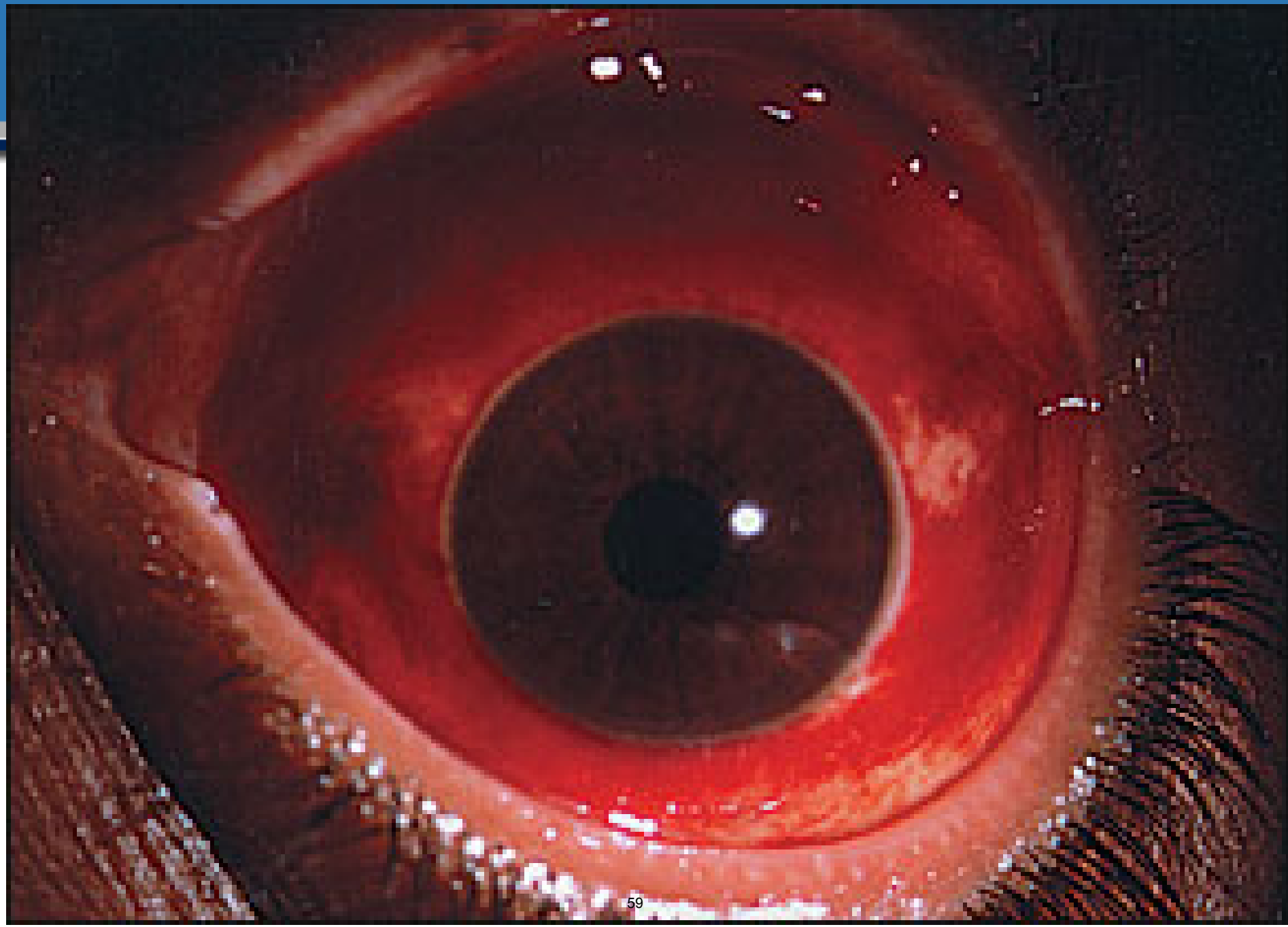
- Foreign body sensation
- Red inflamed eye
- Hyphema
- Halos around lights
- Laceration of lid margin or medial canthus
- Chemosis
- Broken contact or shattered glasses

Immediate Referal

- Suspected globe perforation
- Litigenous patient or parents

CONJUCTIVA

- Abrasion
- Laceration
- Subconjuctival hemorrhage
- Chemosis
- All of the above

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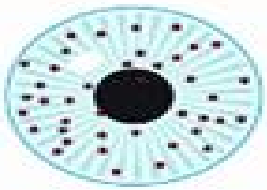
HYPHEMA

- Most hyphema are microscopic with only 50% forming a layer.
- 40% have a clot adherant to the iris stroma.
- 10% have a clot in contact with the endothelium. Increased risk of corneal blood staining.
- Most common site of bleeding is the anterior aspect of the ciliary body (71%)
- Duration of uncomplicated hyphema is usually 5 - 6 days

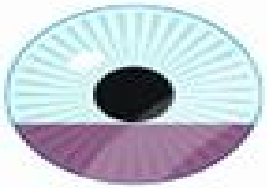
HYPHEMA

- GRADE 1 - BLOOD OCCUPYING LESS THEN ONE THIRD OF ANTERIOR CHAMBER. 58%
- GRADE 2 - BLOOD OCCUPYING ONE THIRD TO ONE HALF OF ANTERIOR CHAMBER. 20%
- GRADE 3 - BLOOD FILLING ONE HALF TO LESS THAN TOTAL OF ANTERIOR CHAMBER. 14%
- GRADE 4 - TOTAL CLOTTED BLOOD (8 BALL). 8%

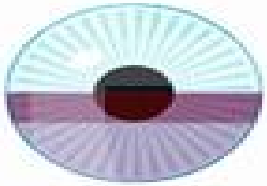
Hyphema Grading



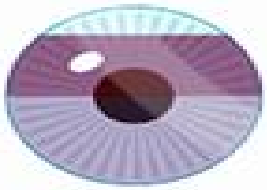
Microhyphema
Circulating red blood cells



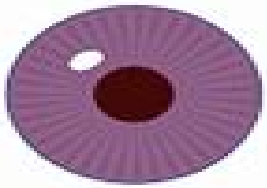
Grade I
≤ 1/3 anterior chamber vol.



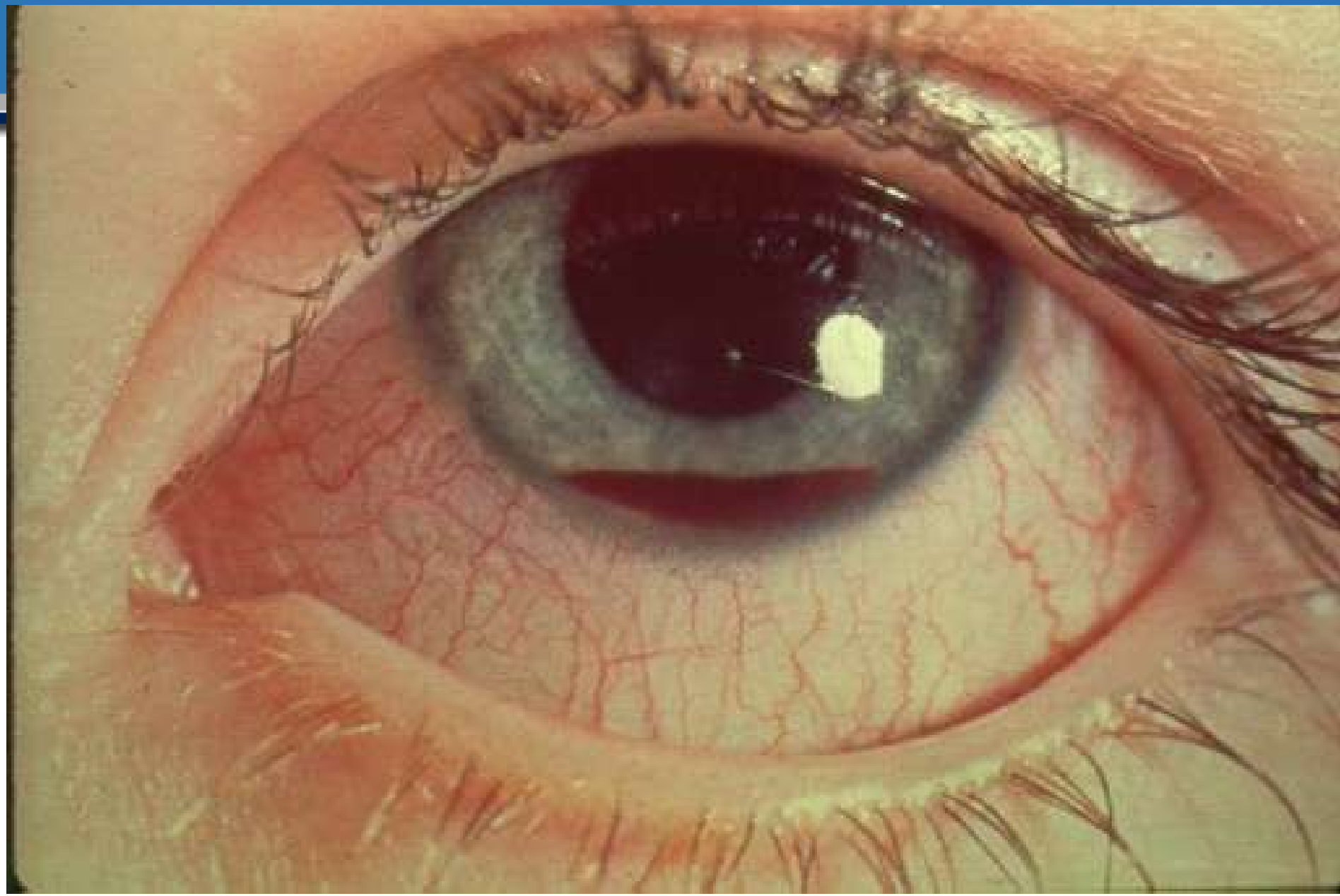
Grade II
1/3 - 1/2 anterior chamber vol.

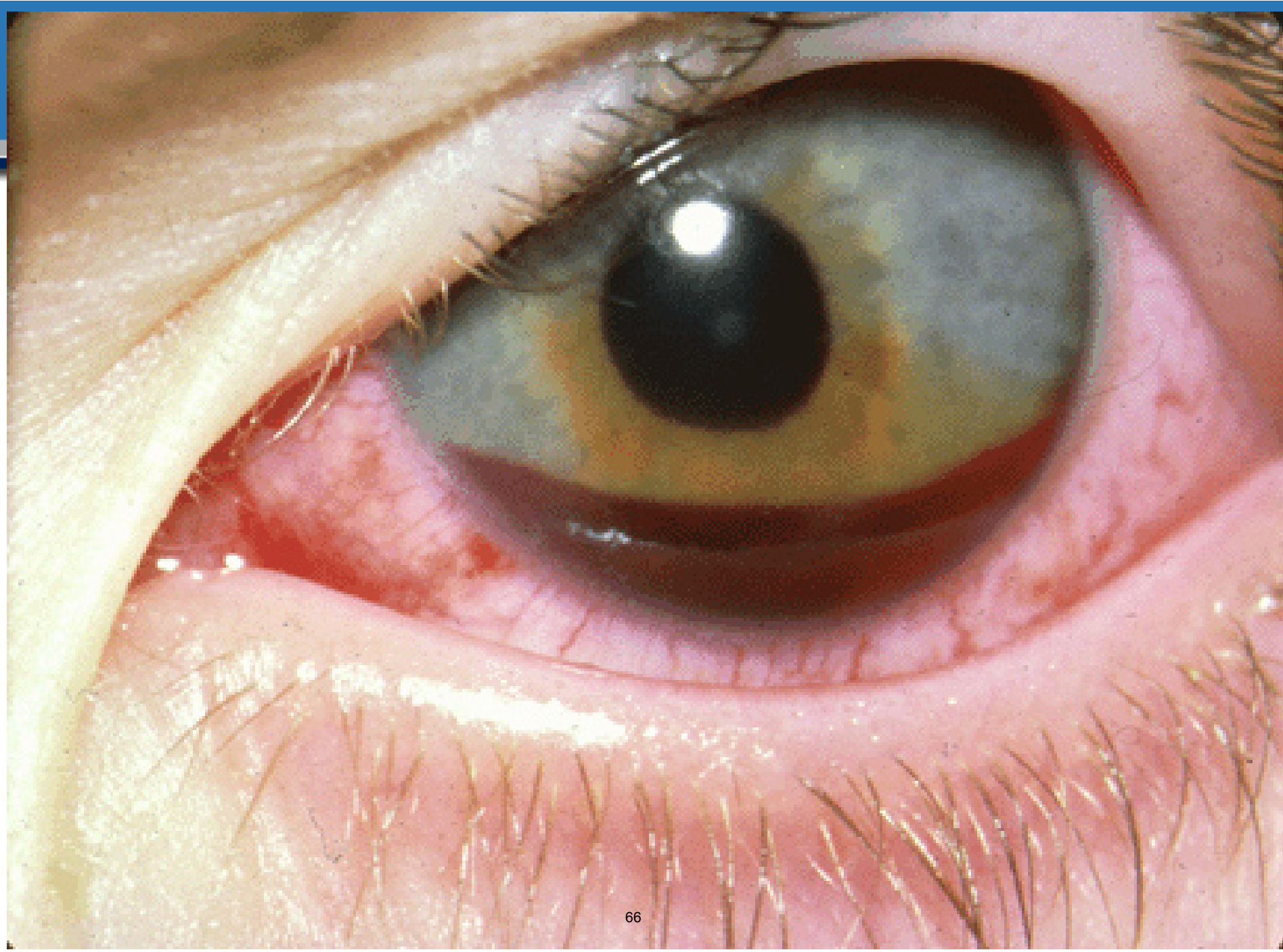


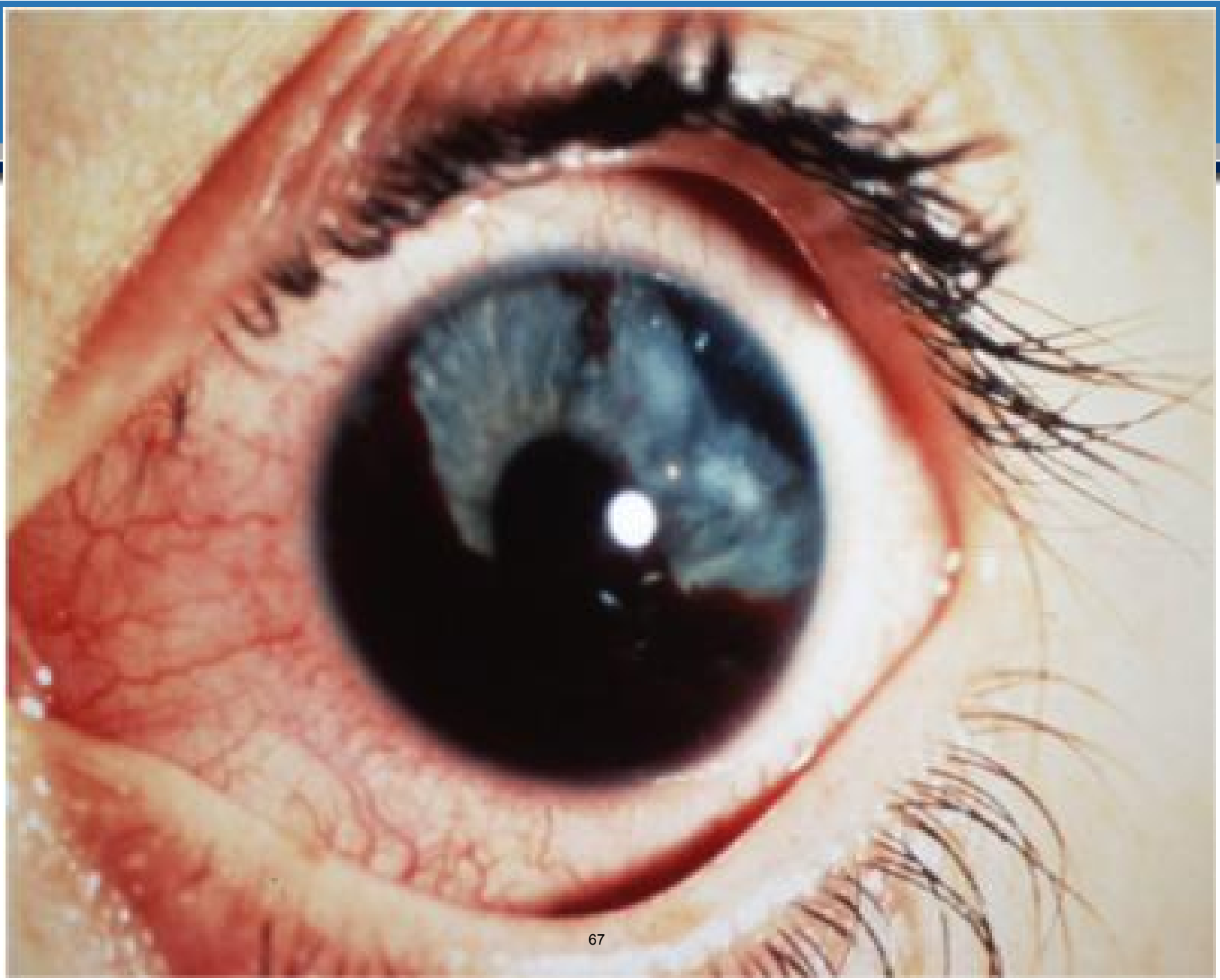
Grade III
> 1/2 anterior chamber vol.

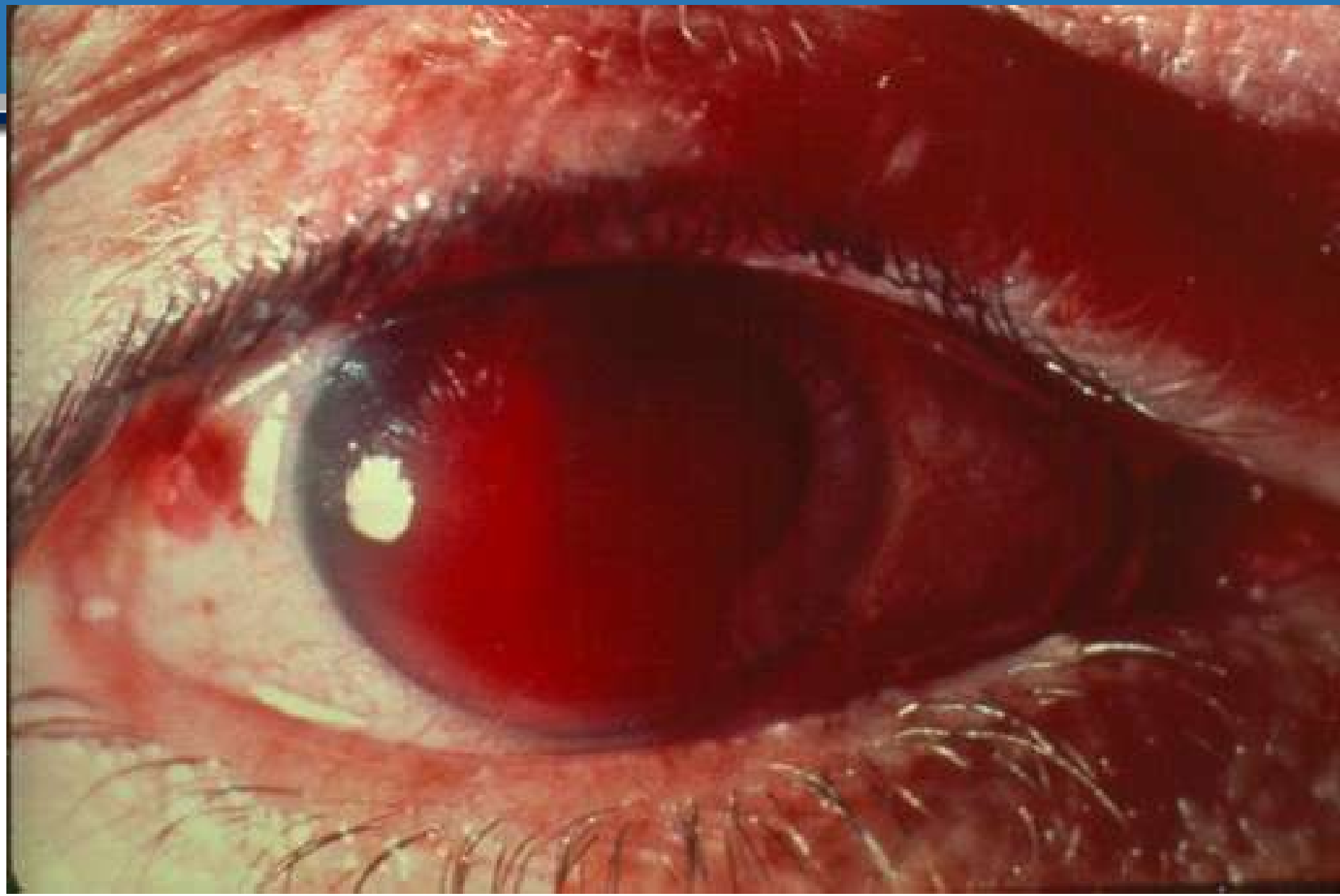


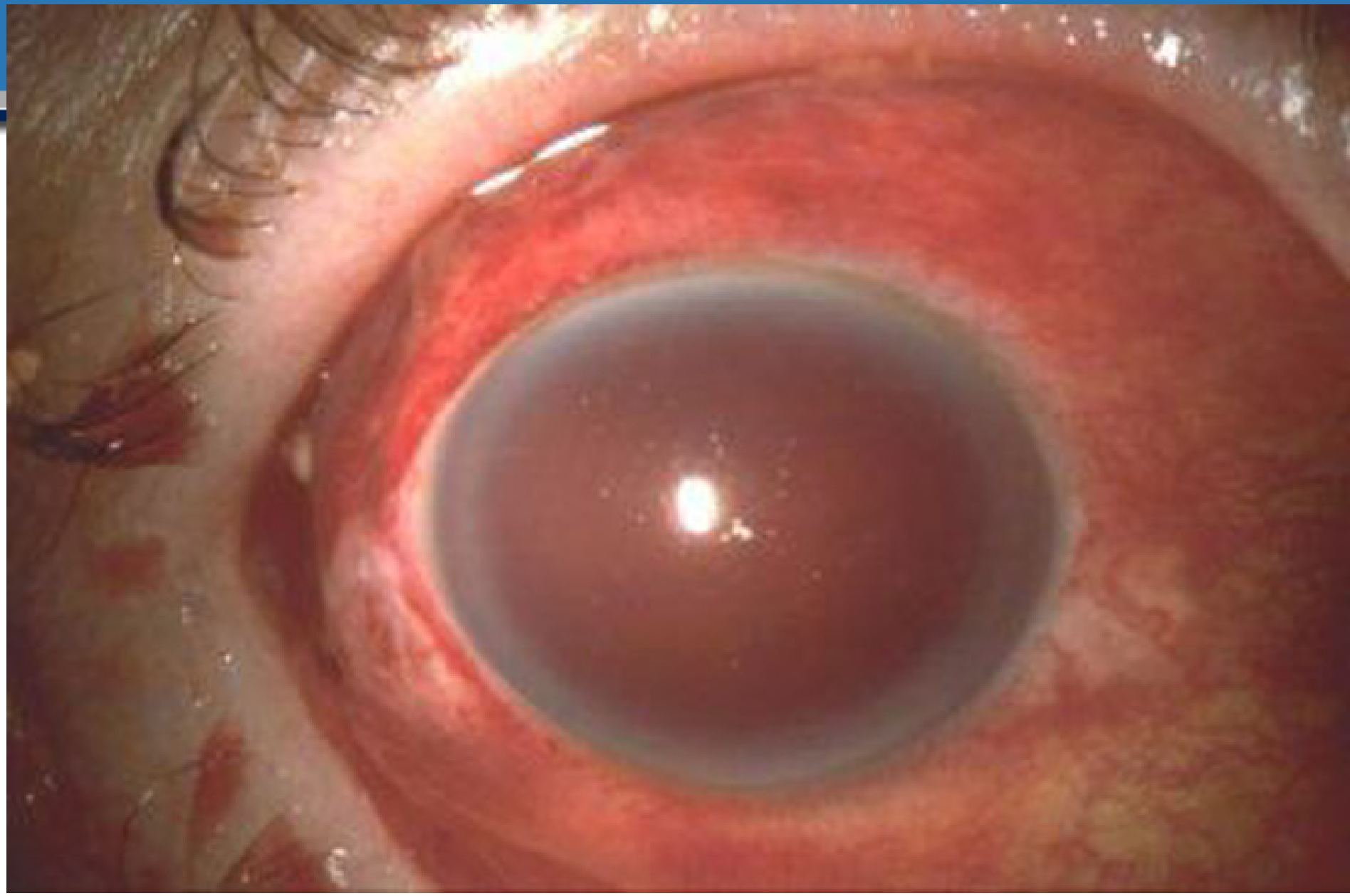
Grade IV
Total anterior chamber vol.
"eight ball hyphema"

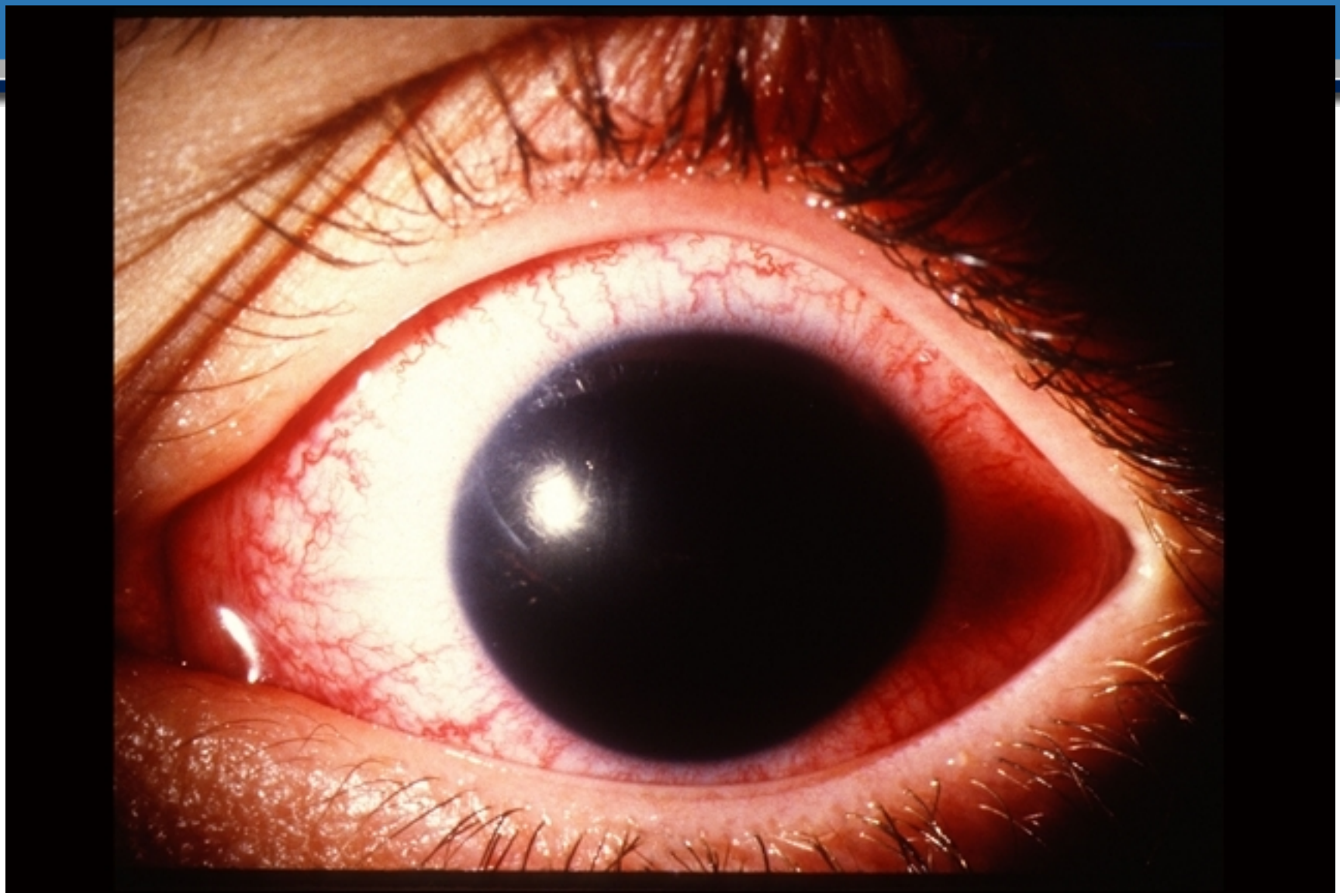












HYPHEMA COMPLICATIONS

- Rebleeding
- Glaucoma
- Posterior synechiae
- Peripheral anterior synechiae
- Corneal bloodstaining

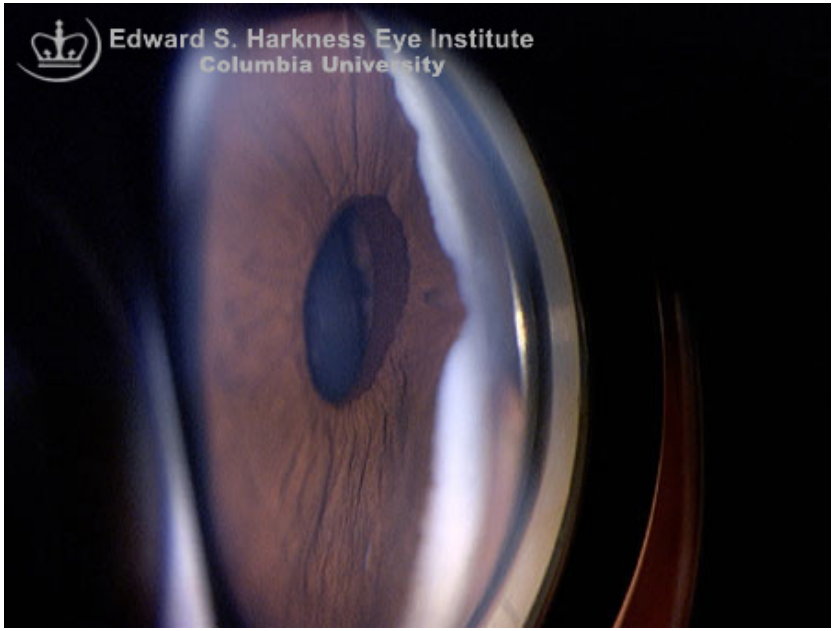
HYPHEMA

- REBLEEDING SIGNIFICANTLY WORSENS THE PROGNOSIS.
- 64% OF PATIENTS WITH REBLEED HAVE 20/50 OR BETTER VISION COMPARED WITH 80% OF PATIENTS WITHOUT REBLEED.
- REBLEEDS OCCURS IN 25% OF ALL HYPHEMAS (7 - 38%).
- HIGHER INCIDENCE IN GRADES 3 AND 4.
- MOST OFTEN BETWEEN DAYS 3 - 4 (RANGE 2 - 7 DAYS).
- 33% OF CHILDREN YOUNGER THAN 6.
- MORE FREQUENT IN AFRICAN AMERICANS 24.2% VS 4.5%

HYPHEMA - INCREASED IOP

- IOP MAY OCCUR IN HYPHEMAS OF ANY SIZE.
- INCREASED IOP > 22 OCCURS IN 32%.
- HIGHER ELEVATIONS OF IOP ARE MORE COMMONLY ASSOCIATED WITH NEAR TOTAL OR TOTAL HYPEMAS.
- PATIENTS PREDISPOSED TO GLAUCOMA OR HAVE GLAUCOMA HAVE A HIGHER INCIDENCE.

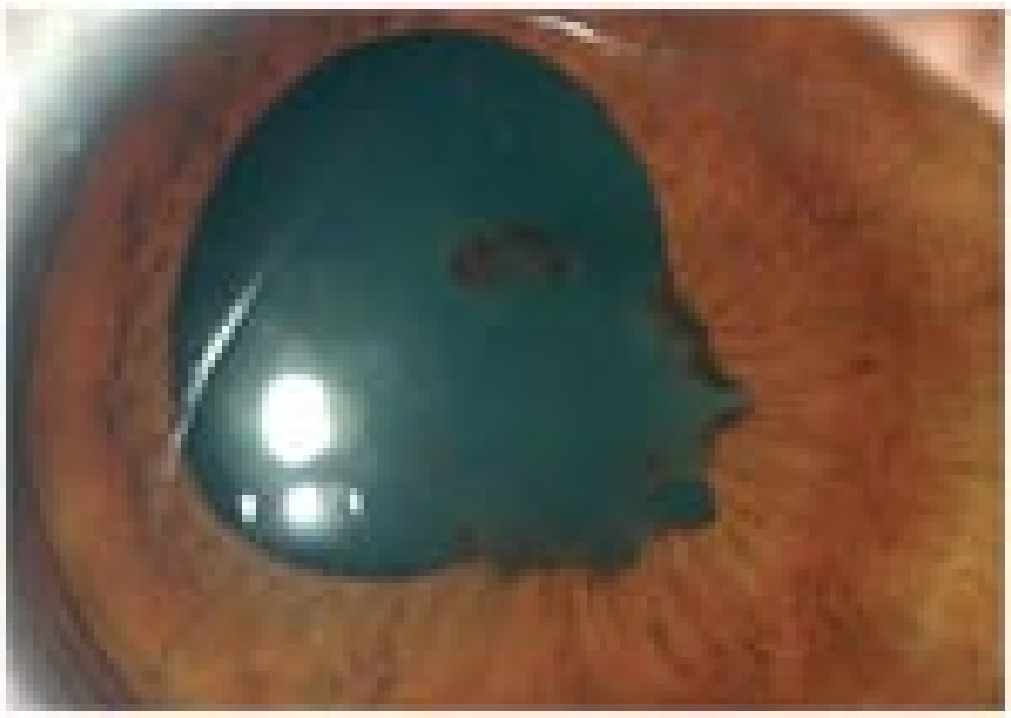
HYPHEMA COMPLICATIONS ANTERIOR SYNECHIAE



- Peripheral anterior synechiae develop in medically treated patients in whom the blood has remained for a prolonged period of time. Most often longer then 9 days.

- Anterior synechiae result from inflammation secondary to the initial trauma and /or chemical iritis from blood in the anterior chamber.

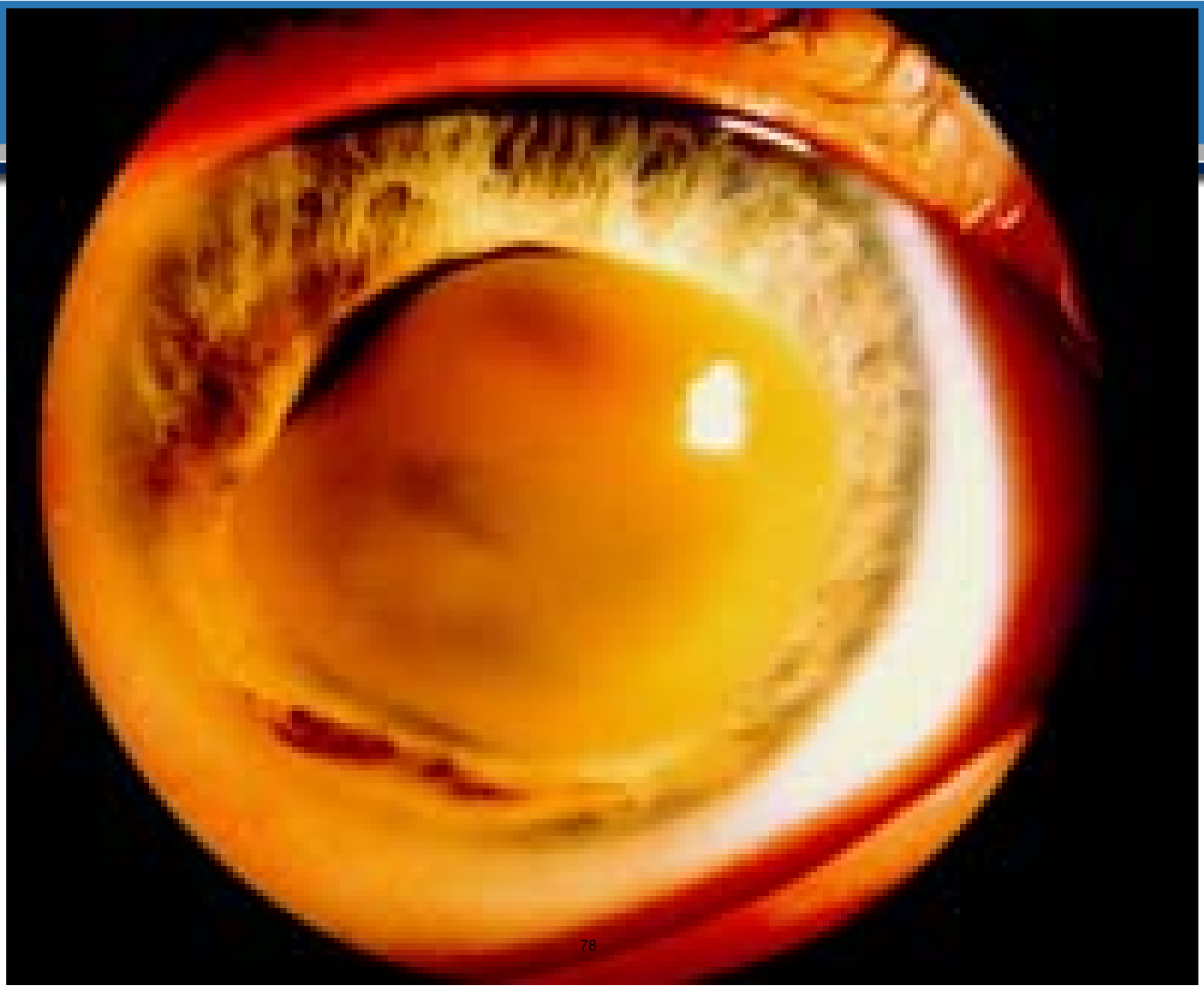
HYPHEMA COMPLICATIONS POSTERIOR SYNECHIAE



- Posterior synechiae develop secondary to iritis or iridocyclitis. Occur rarely in medically treated patients.

HYPHEMA -CORNEAL BLOODSTAINING

- Status of endothelium
- Large clot in contact with endothelium.
- Grade 3 or 4 with elevated intraocular pressure for at least 6 days.
- May occur with lower IOP or higher IOP over a shorter period of time.
- Starts centrally and spreads peripherally.
- Clears over weeks to months. Clearing starts peripherally.

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HYPHEMA - PROGNOSIS

- Overall 75% maintain good vision.
- 80% with grade 1 regain visual acuity of 20/40 or better.
- Depends on whether there are other associated injuries.
- 60% with grade 3 regain visual acuity of 20/40 or better.
- 35% with grade 4 regain visual acuity of 20/40 or better.
- Poor visual acuity related directly to hyphema 11%

HYPHEMA - TREATMENT

- Hospitalization vs nonhospitalization
- Topical steroids
- Cycloplegics
- Antifibrinolytic agents - aminocaproic acid (aca), tranexamic acid (txa)
- Systemic steroids
- Patching
- Restricted activity
- Patient specific
- Yasuna no touch

High Risk Factors Rebleed

- Sickle-cell trait or anemia
- Secondary hemorrhage
- Penetrating ocular trauma
- Suspected child abuse
- Grade III or IV hyphema
- Noncompliant patients
- Intractable glaucoma

Indications for Surgery

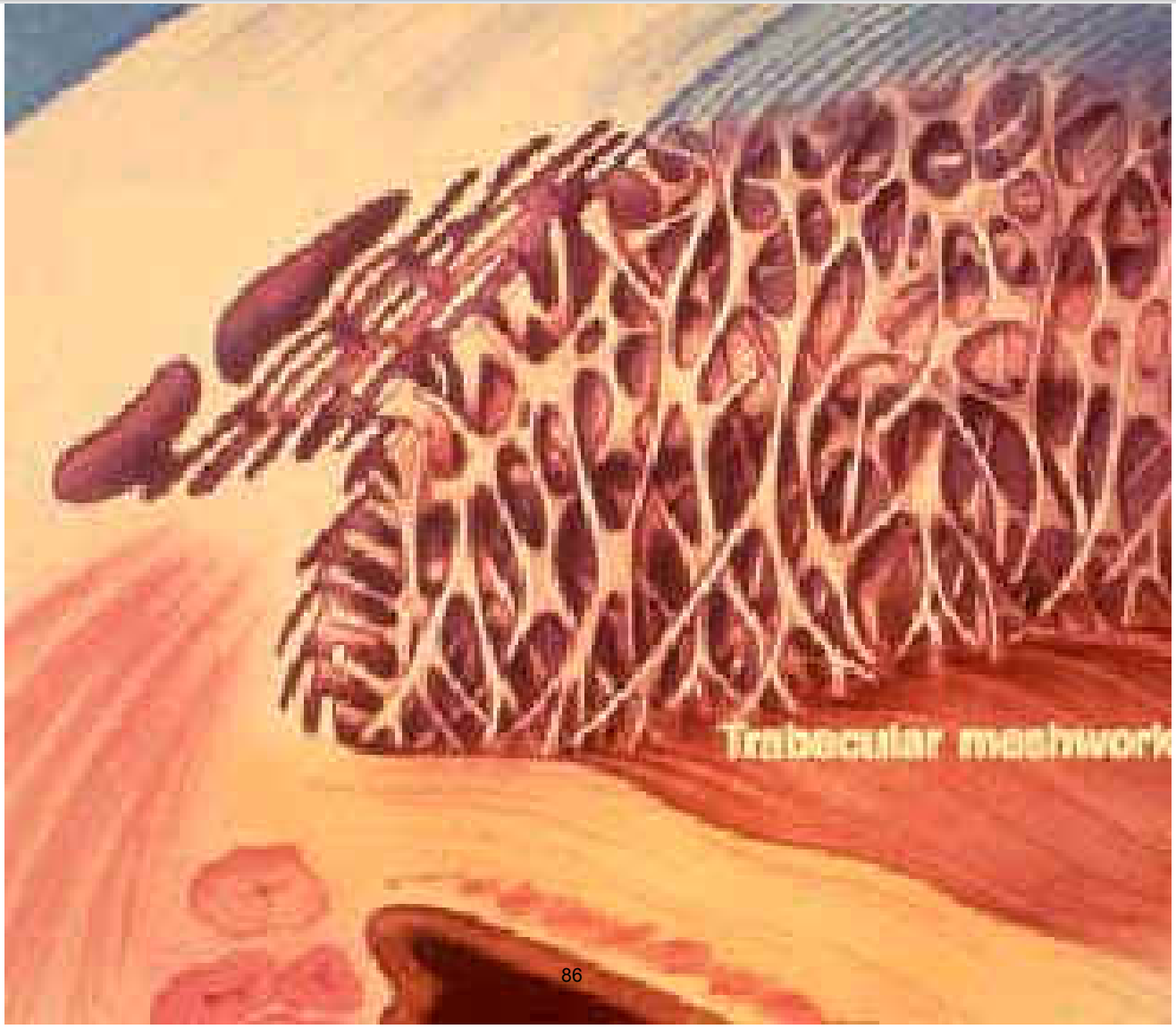
- Microscopic corneal blood staining
- In sickle-cell trait or sickle-cell disease, hyphema of any size and IOP > 24 Hg for more than 24 hours
- Hyphema >1/2 of the anterior chamber for >8 days(to prevent peripheral anterior synechiae)
- Total hyphema with IOP of >50 mm Hg for 4 days(to prevent optic atrophy)
- Total hyphema or >3/4 of anterior chamber volume present for 6 days with IOP of >25 mm Hg (to prevent corneal blood staining)

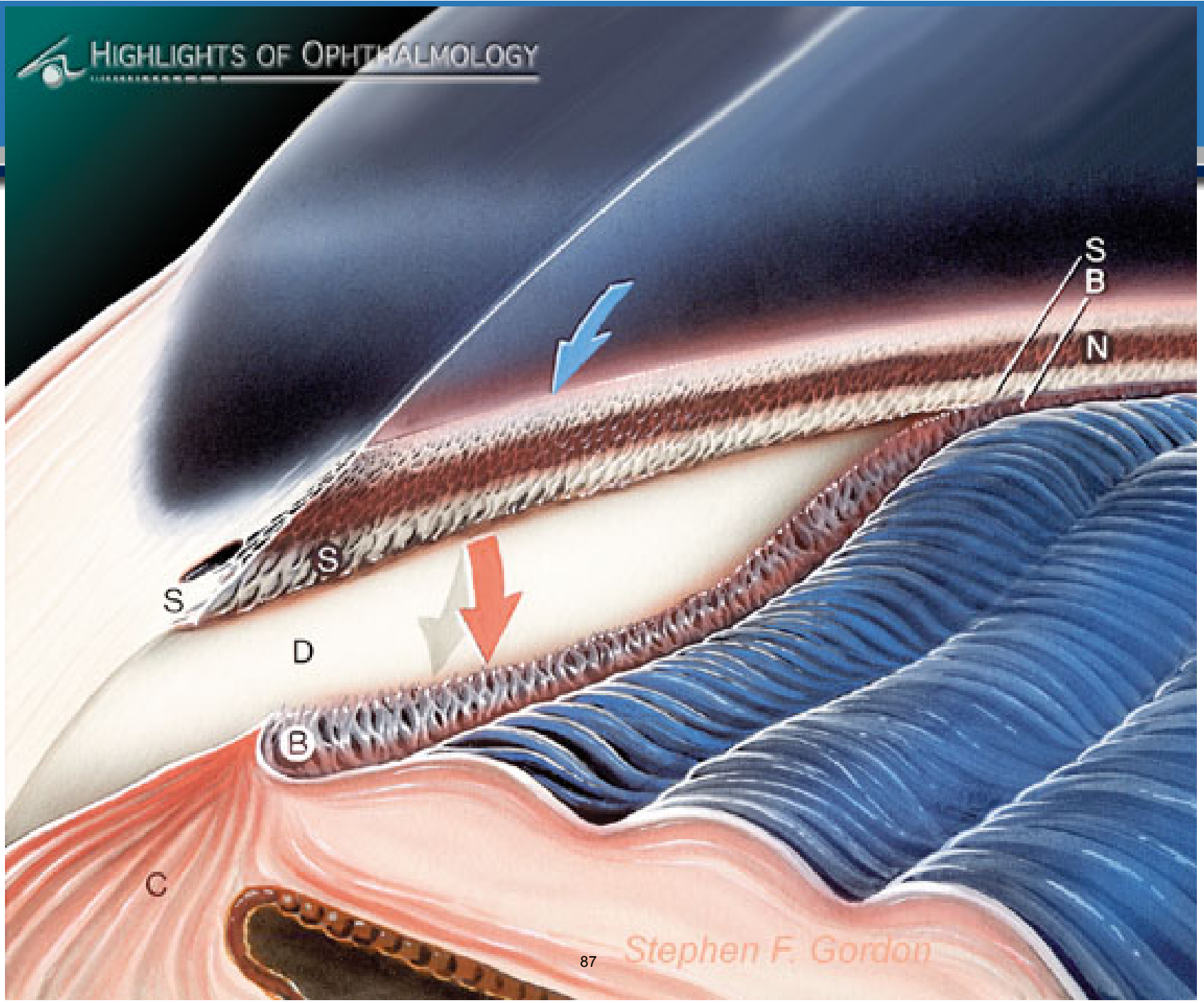
Indications for Surgery

- IOP greater than 60 mm Hg for 2 days (to prevent optic atrophy).
- IOP greater than 24 mm Hg over the first 24 hours or if repeated IOP spikes more than 30 mm Hg in sickle-cell disease or trait.
- IOP greater than 25mmHg with a total hyphema for 5 days(to prevent corneal blood staining).
- Microscopic corneal blood staining.
- The hyphema fails to resolve to less than 50% of the anterior chamber volume by 8 days (to prevent peripheral anterior synechiae formation).

Pearls in Management of Hyphema

- All patients of hyphema should be evaluated in detail for systemic injuries and retained IOFB
- Absolute bed rest and hospitalization is not mandatory
- Topical steroids and cycloplegics are used frequently for initial control of inflammation and rebleeds
- Beta blockers and prostaglandin analogues should be used to control IOP
- Avoid carbonic anhydrase inhibitors, alpha agonists and hyperosmotics in sickle-cell disease/trait
- Most aggressive treatment is needed to prevent optic nerve damage
- Recurrent hemorrhage can occur 2e7 days after trauma
- Regular ophthalmic evaluation is required in patients with angle recession >180


Trabecular meshwork


HIGHLIGHTS OF OPHTHALMOLOGY
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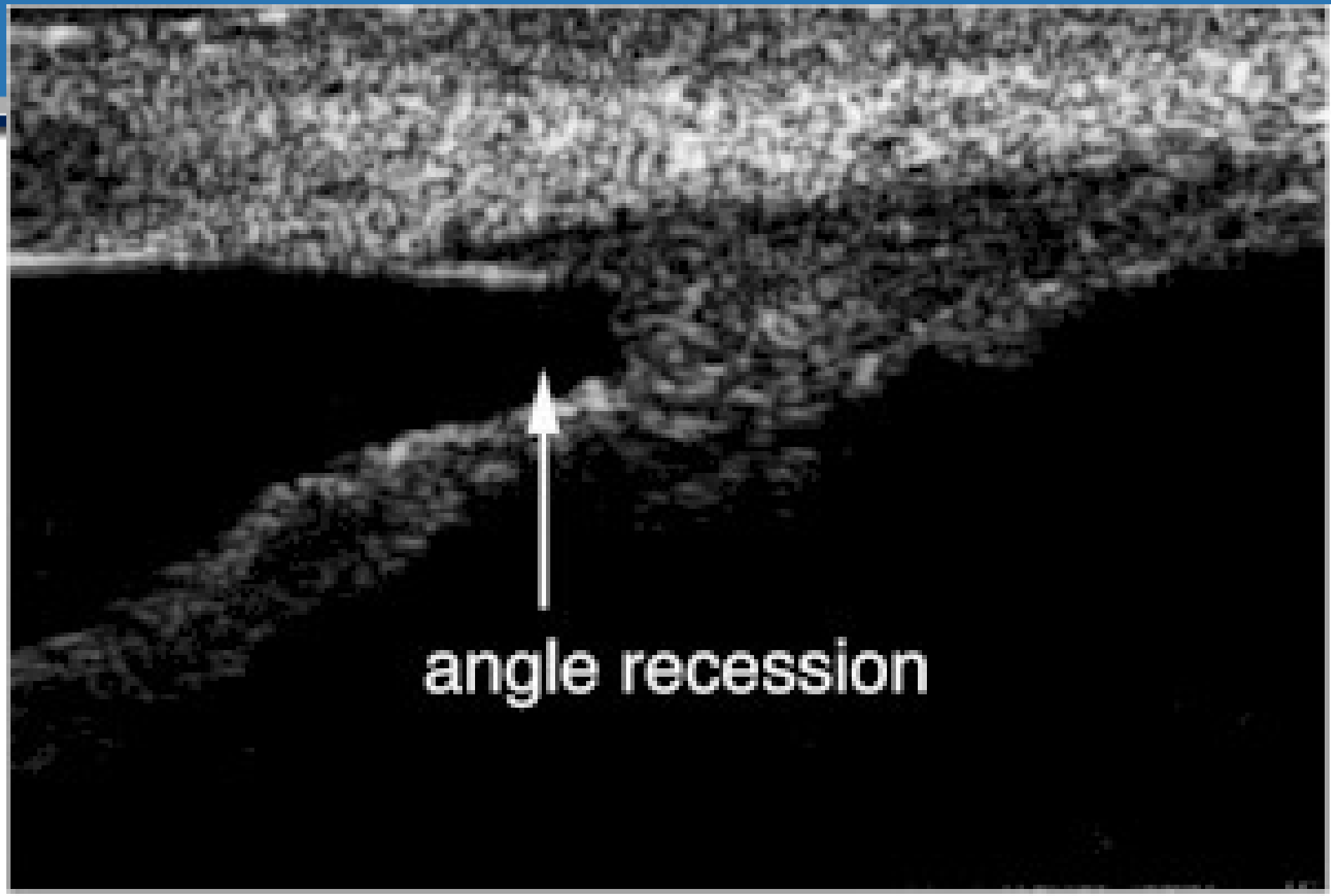
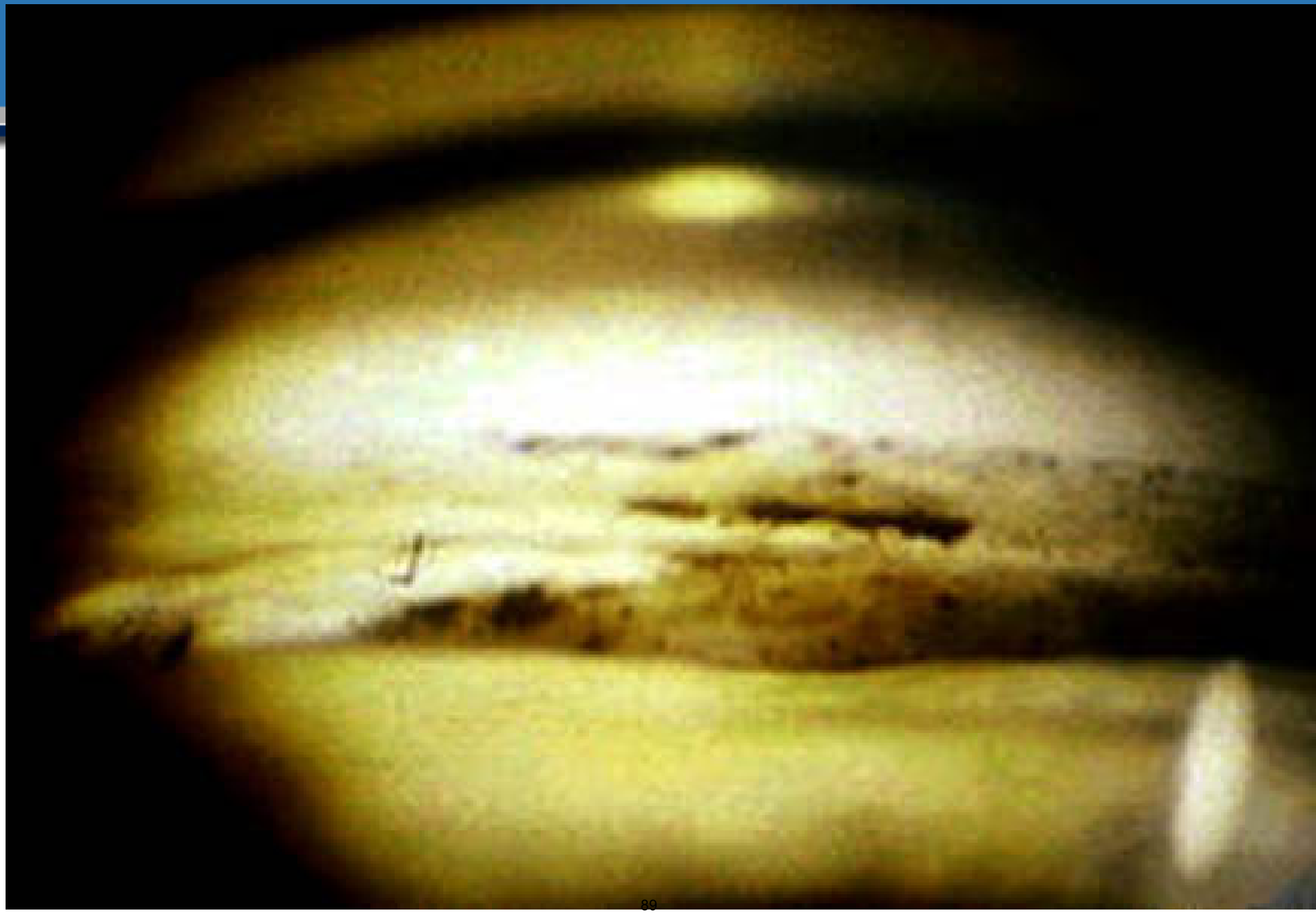
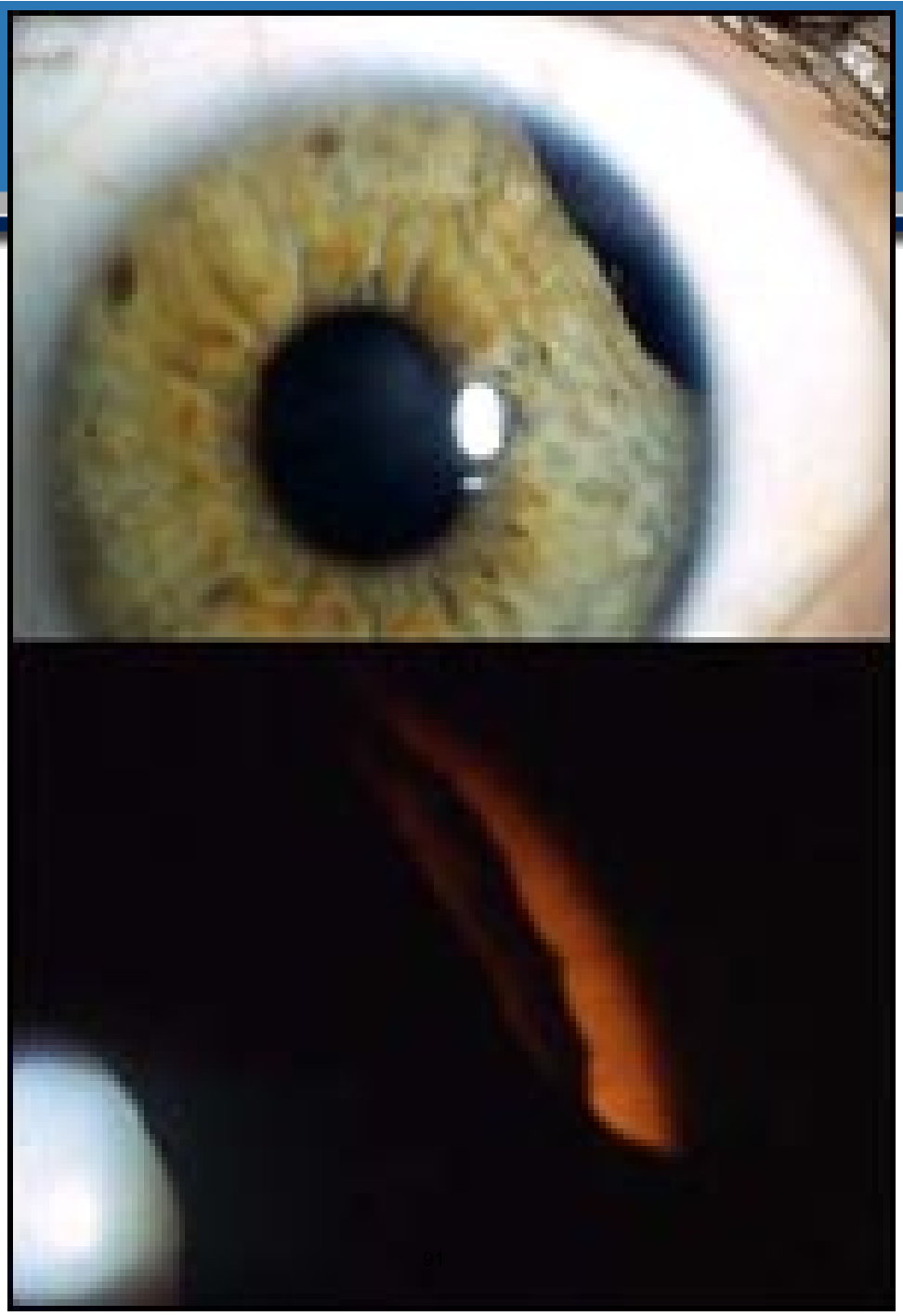
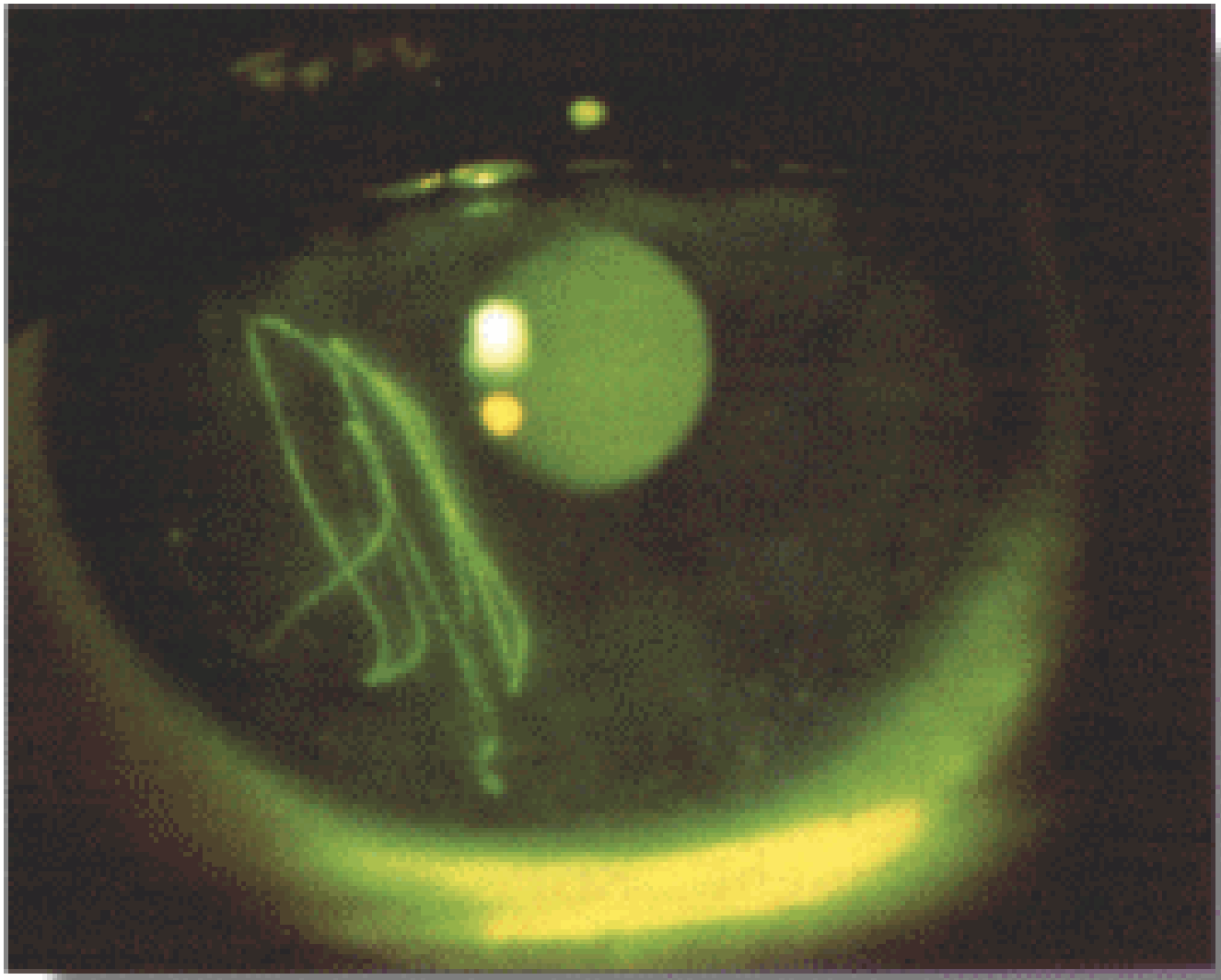

angle recession

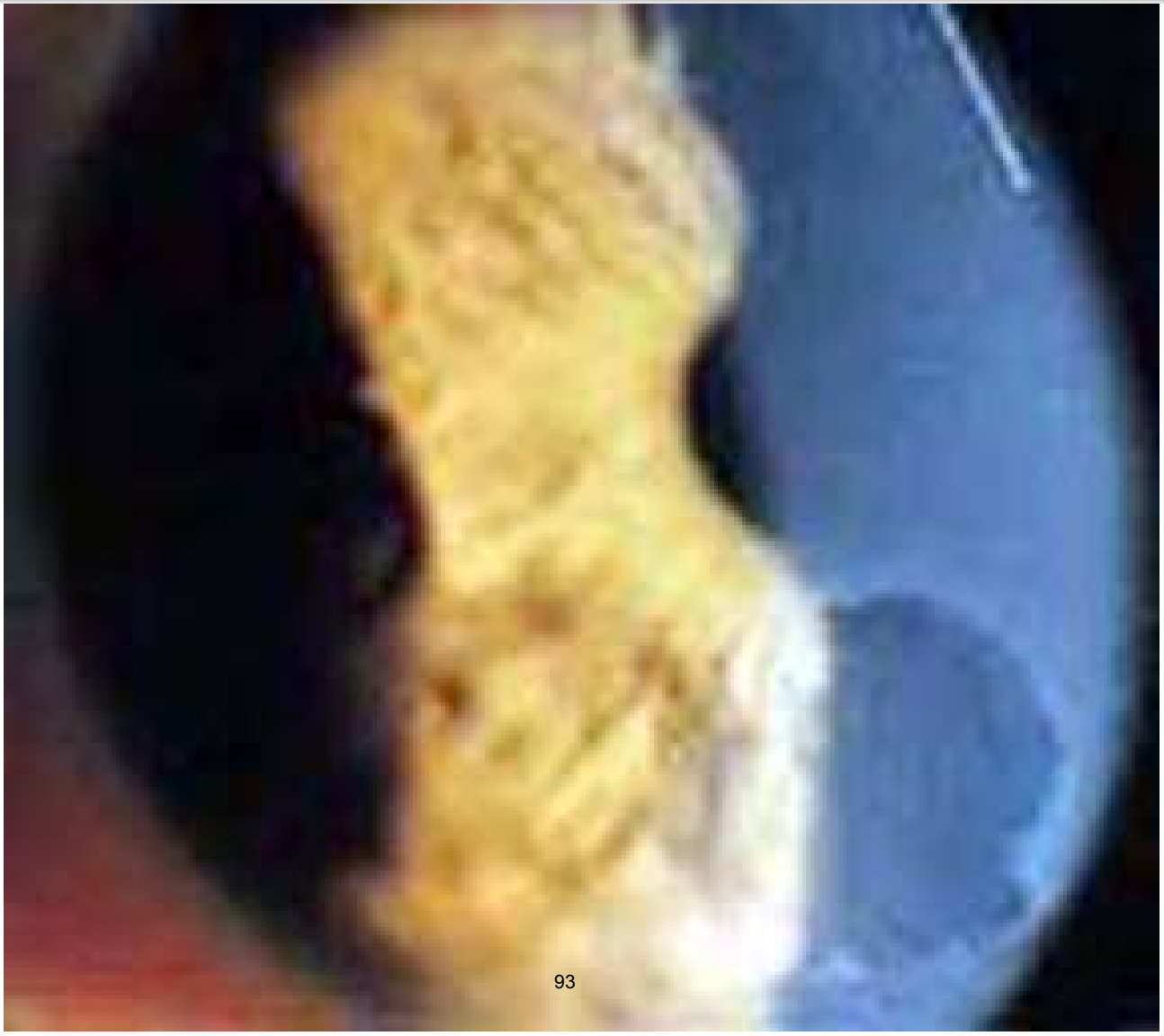


Angle Recession

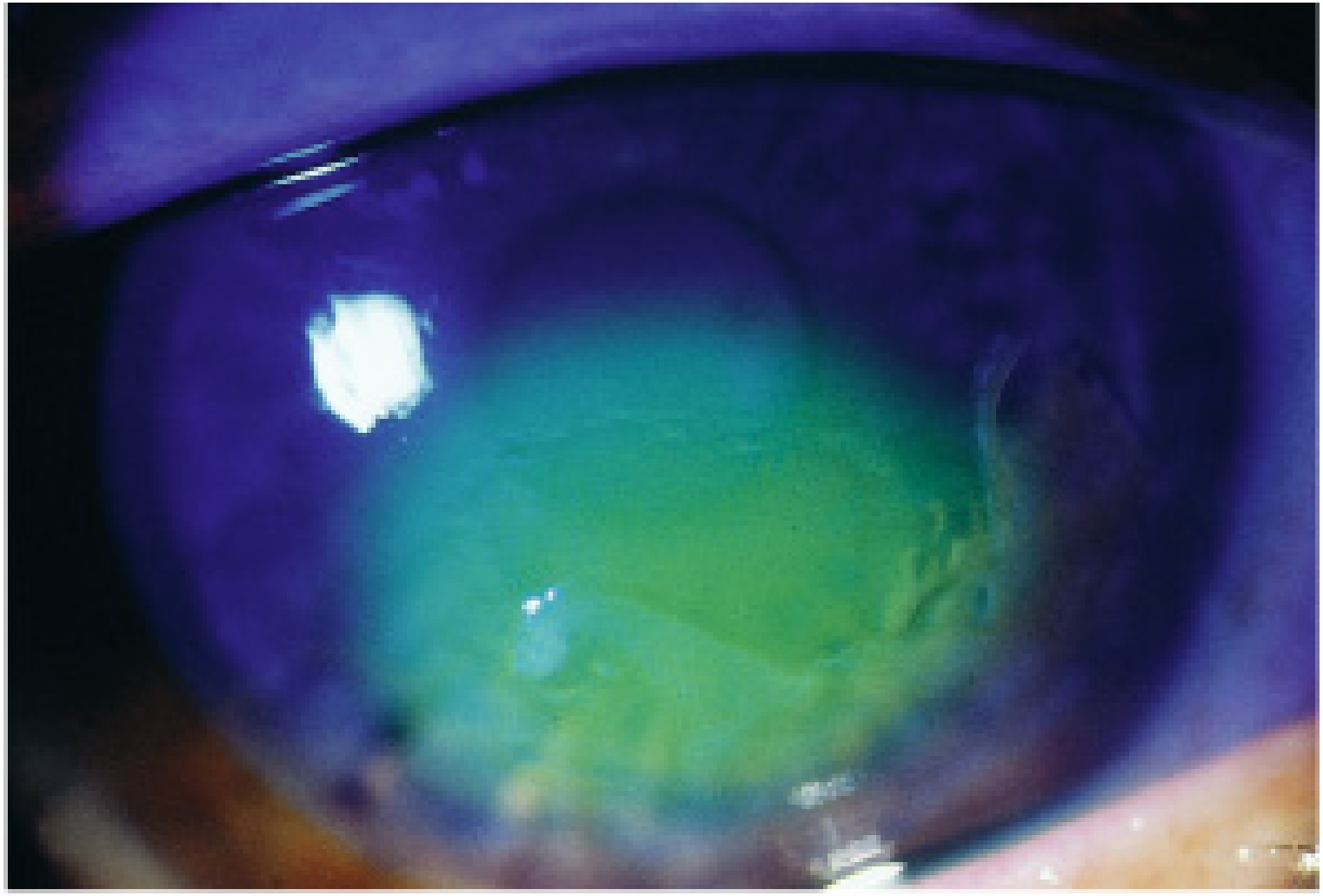
- Less than 20% develop glaucoma
- < 180 degrees unusual to develop glaucoma
- > 180 degrees 4 - 9%
- > 240 degrees highest risk
- All races affected equally





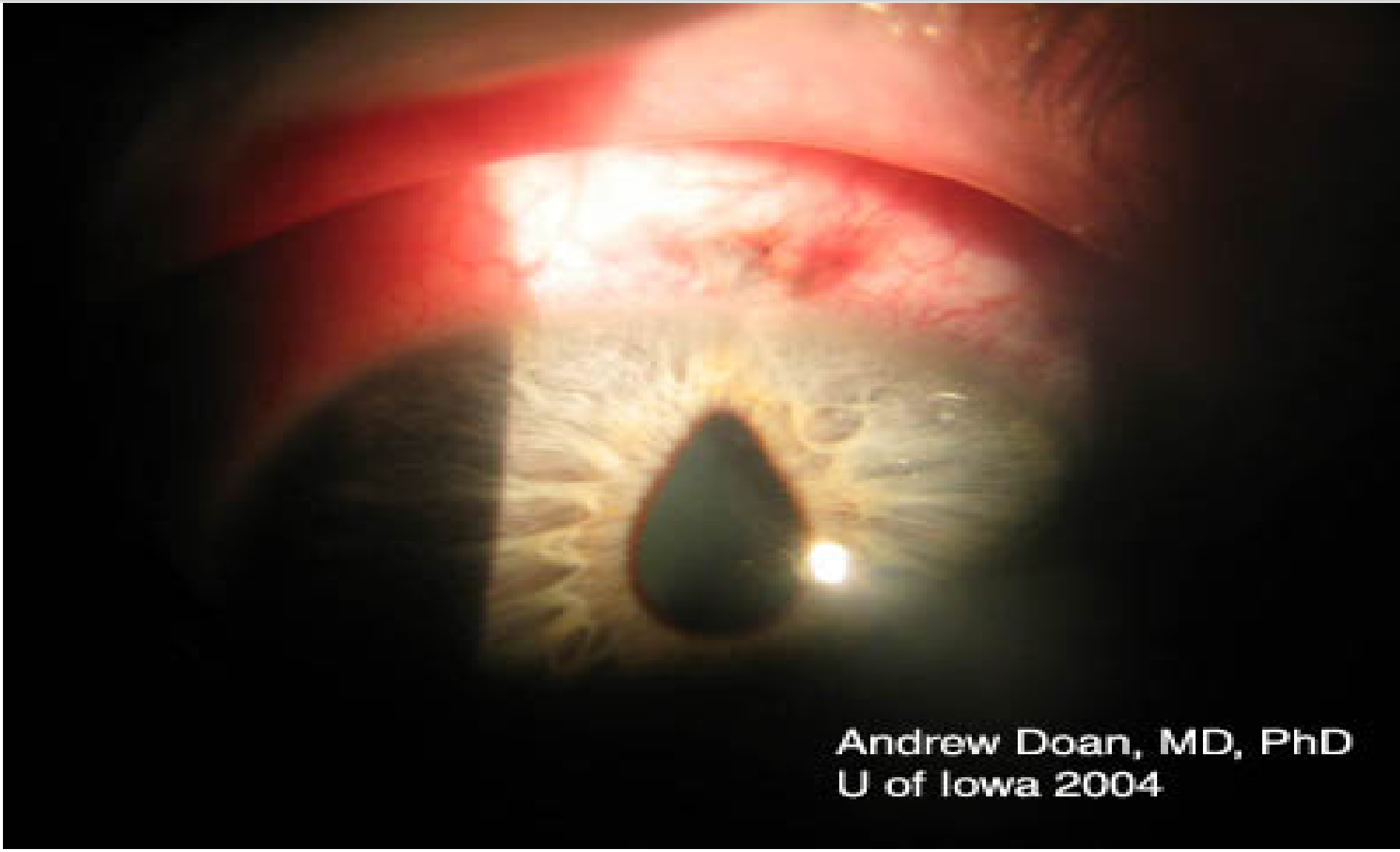


CORNEAL ABRASION



CORNEAL ABRASION TREATMENT

- Topical antibiotics
- Cycloplegics
- Topical steroids
- Patch
- No patch
- Soft contact lens
- Shield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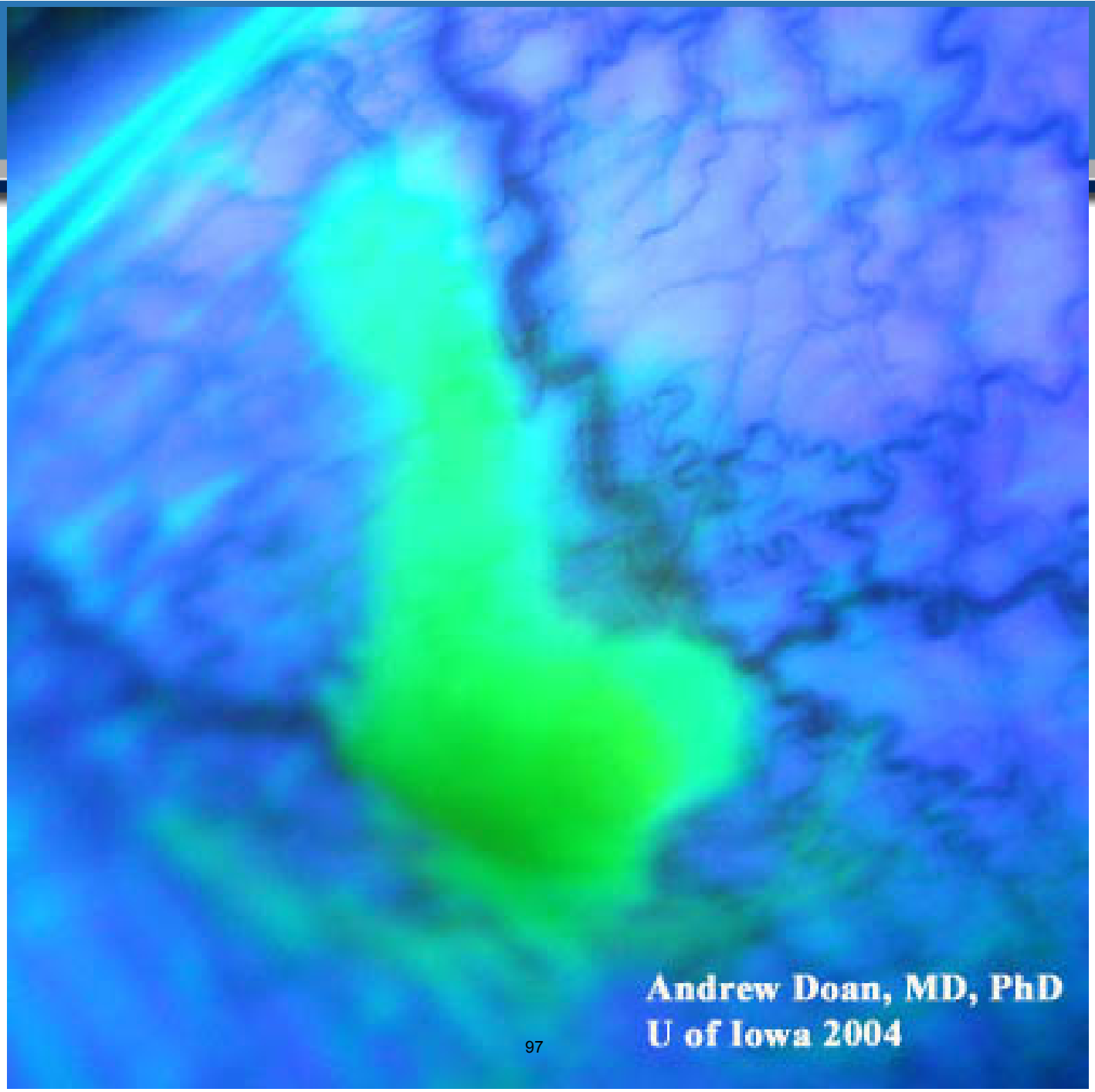
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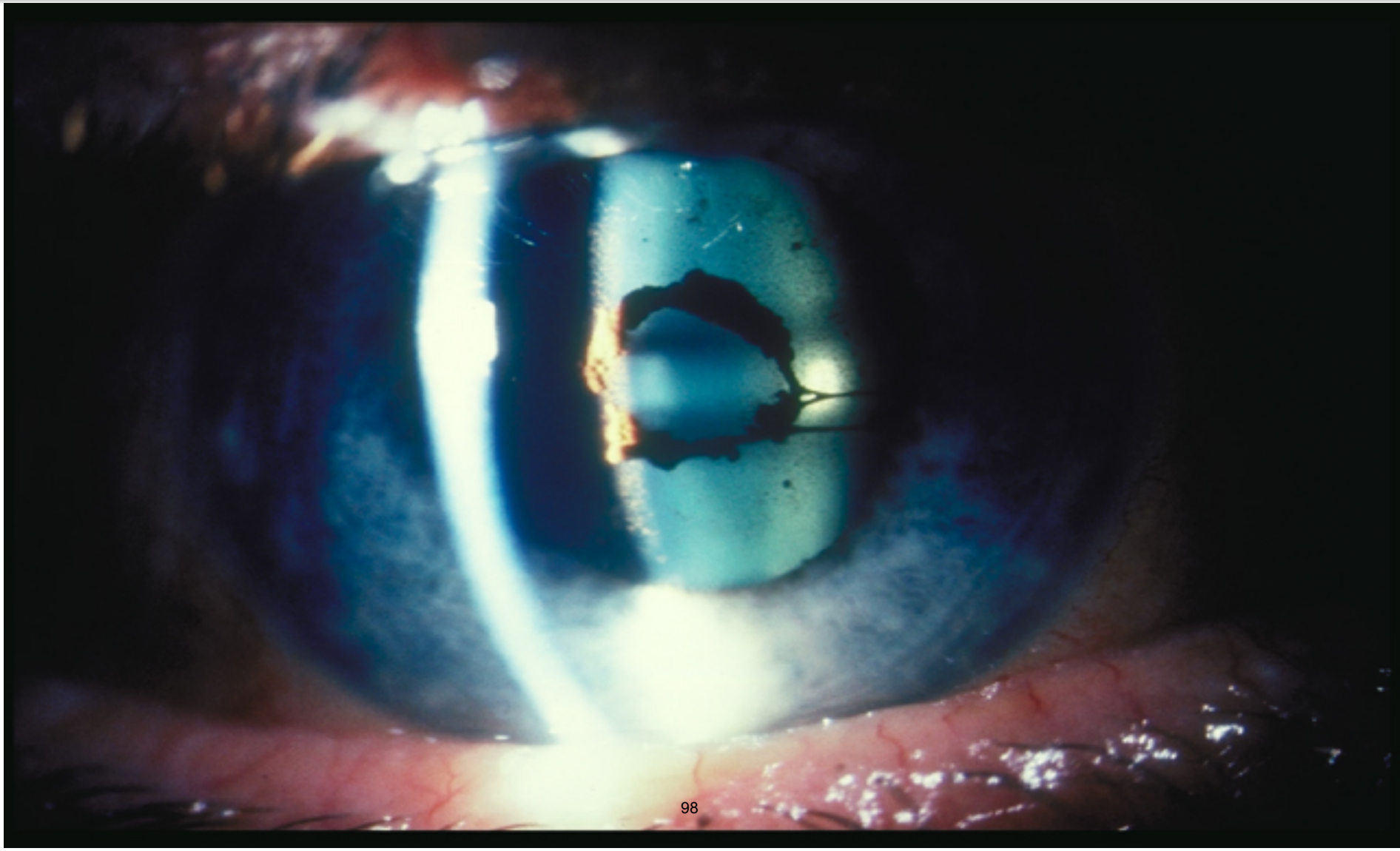

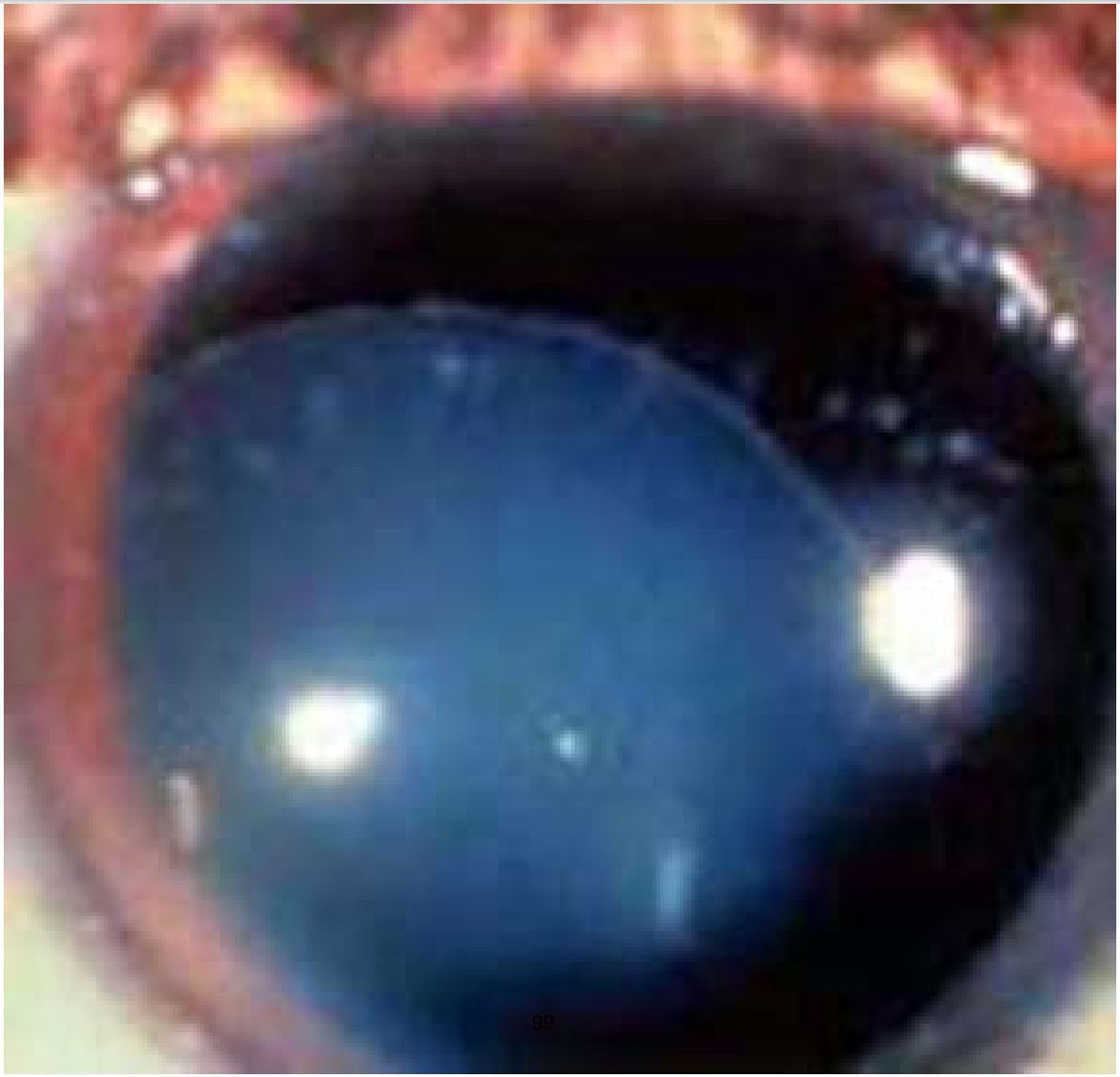

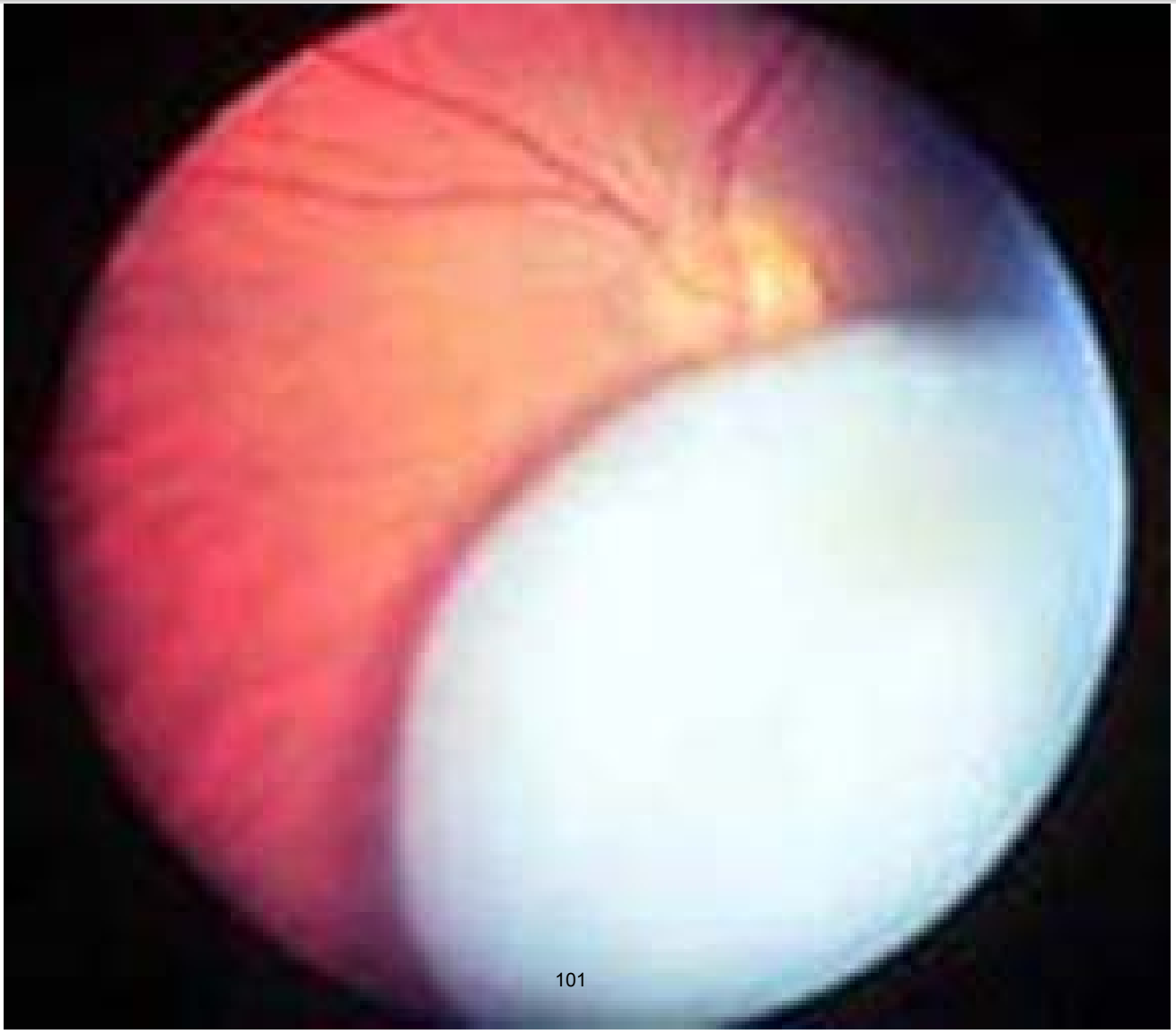

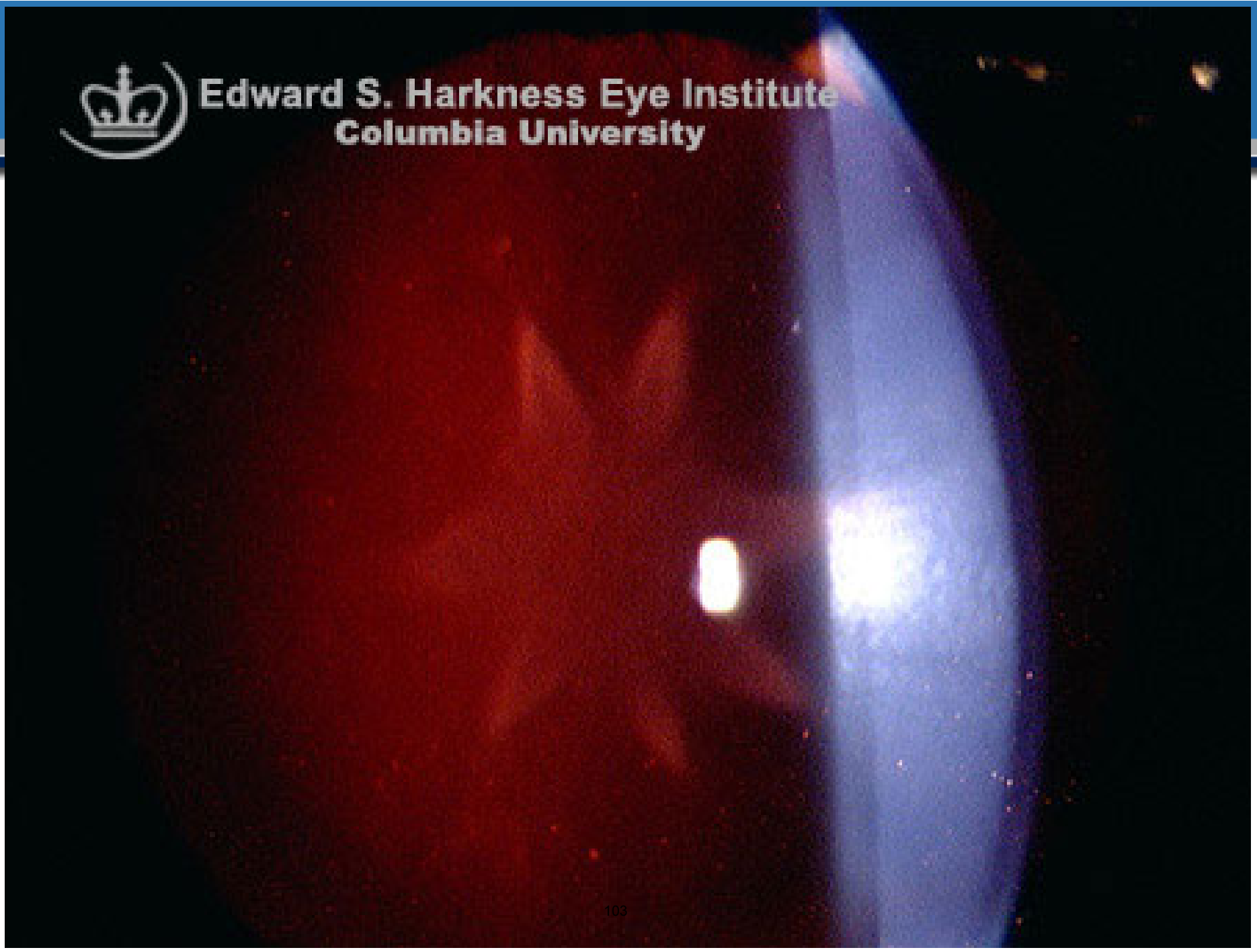
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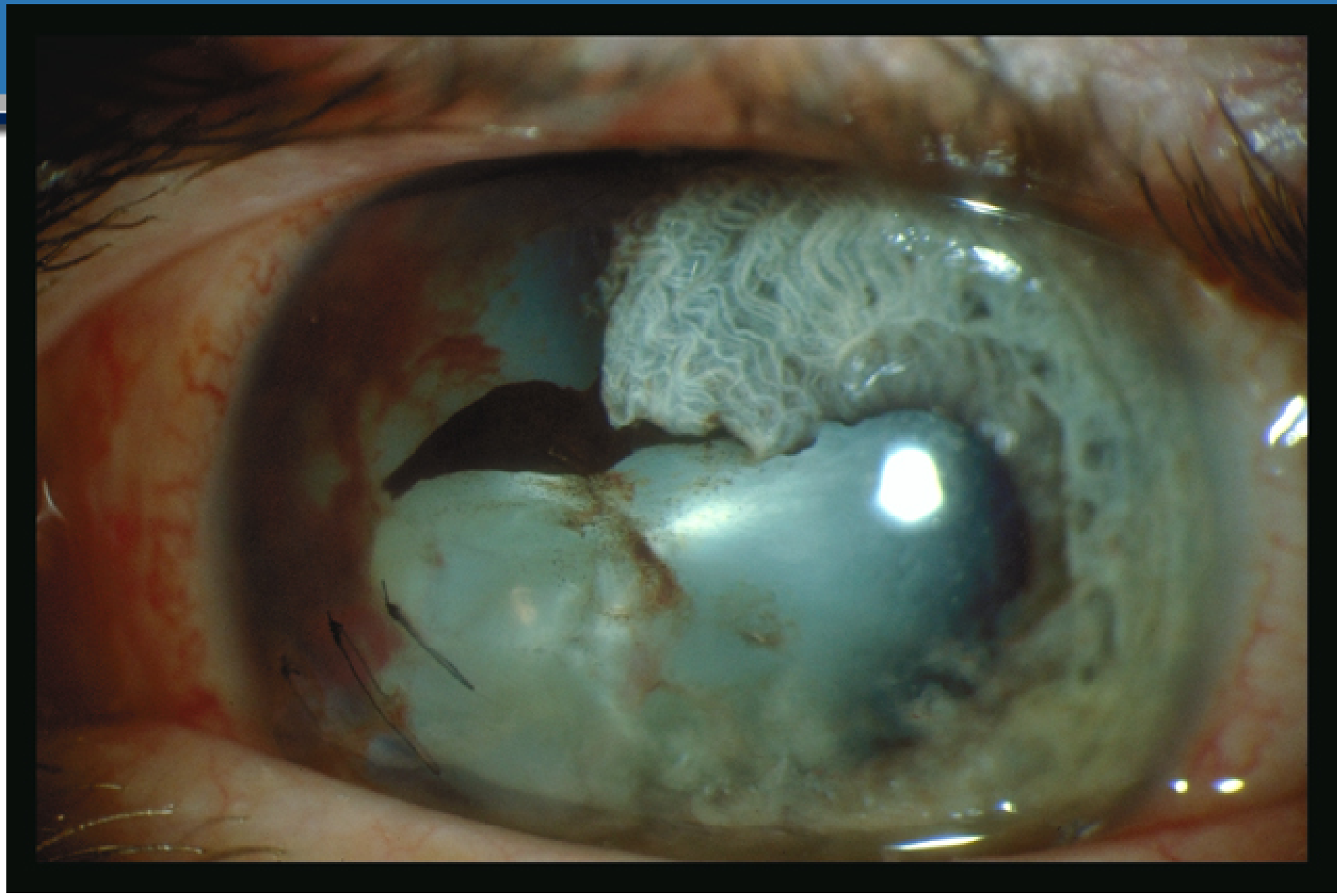
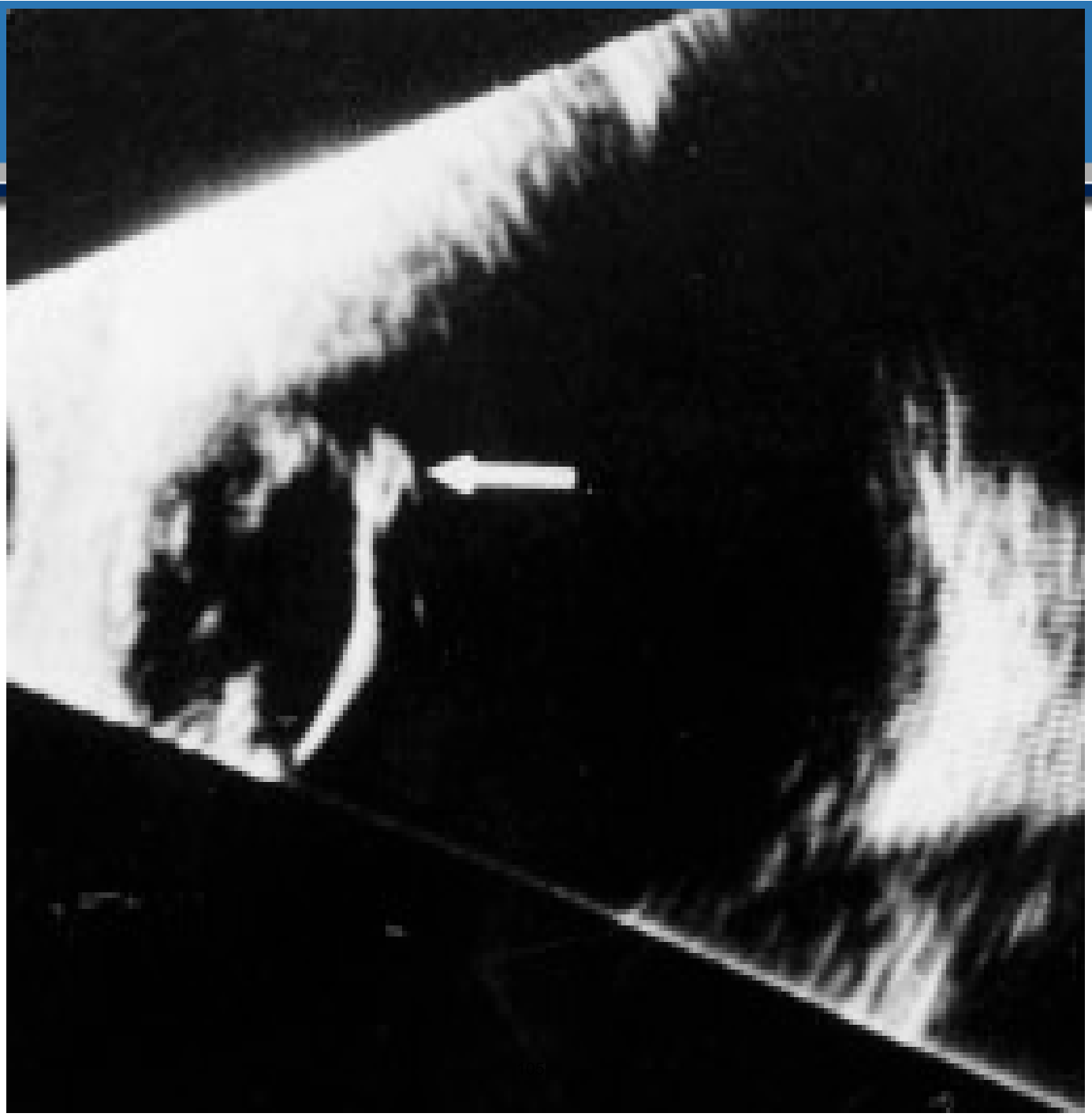
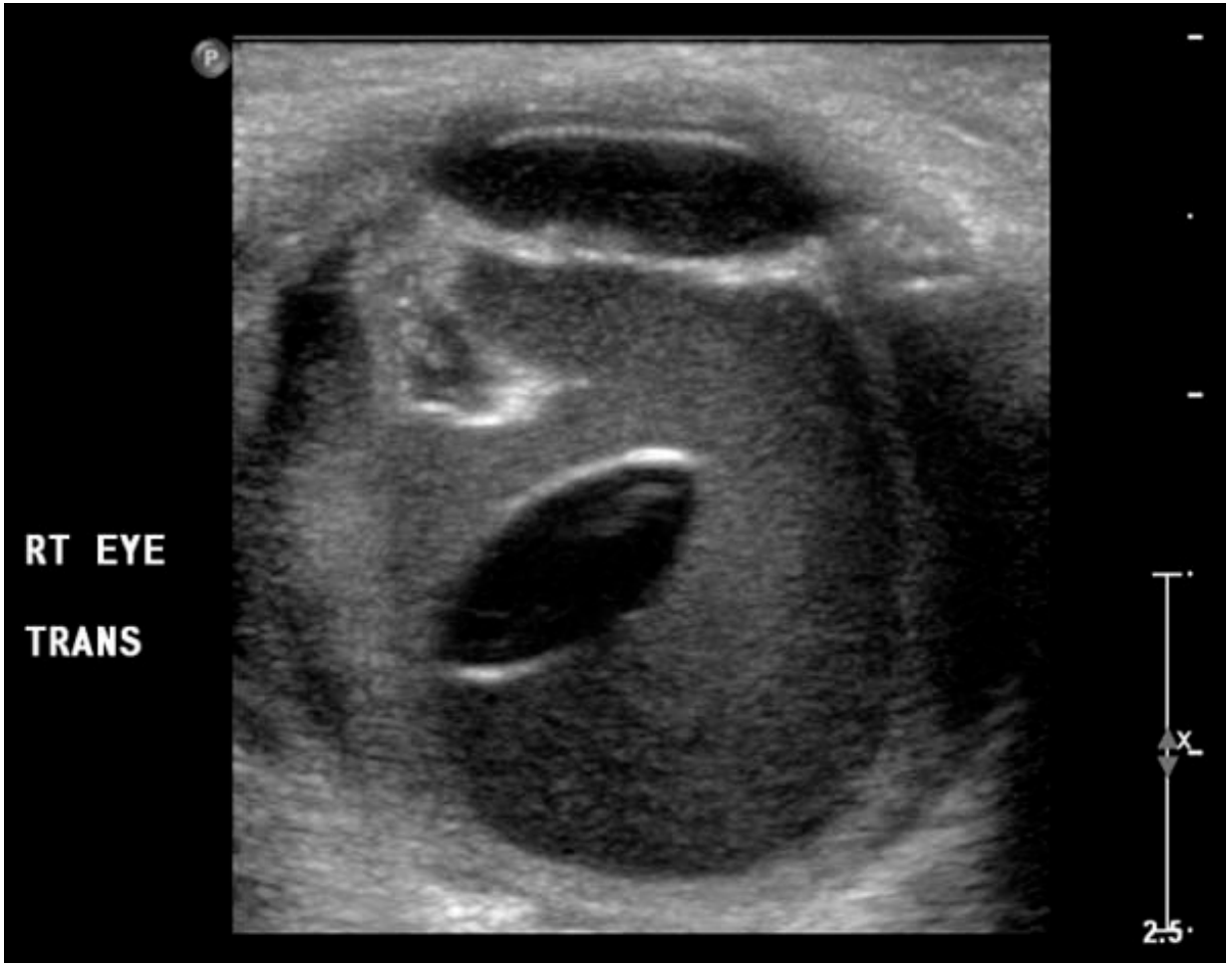
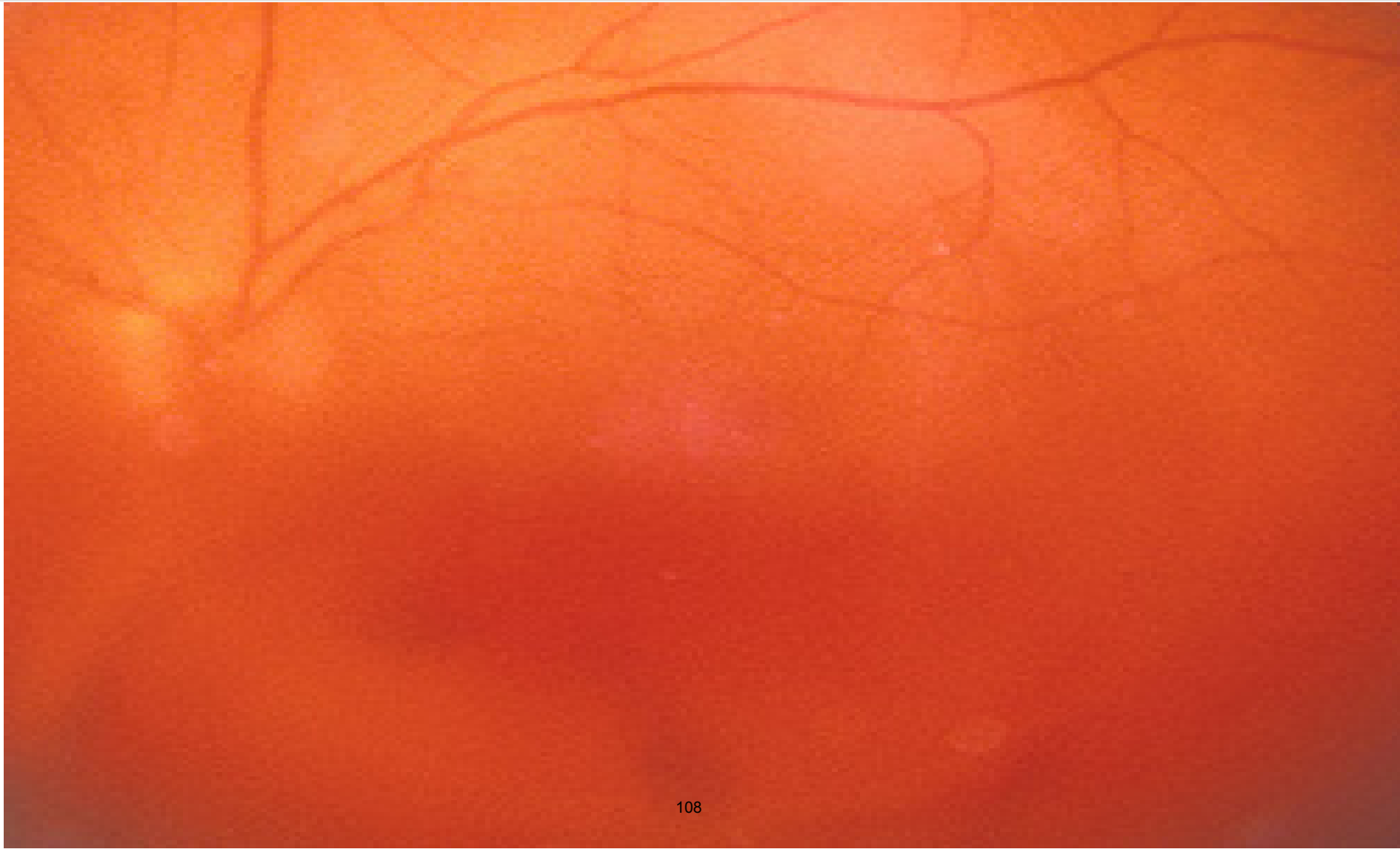


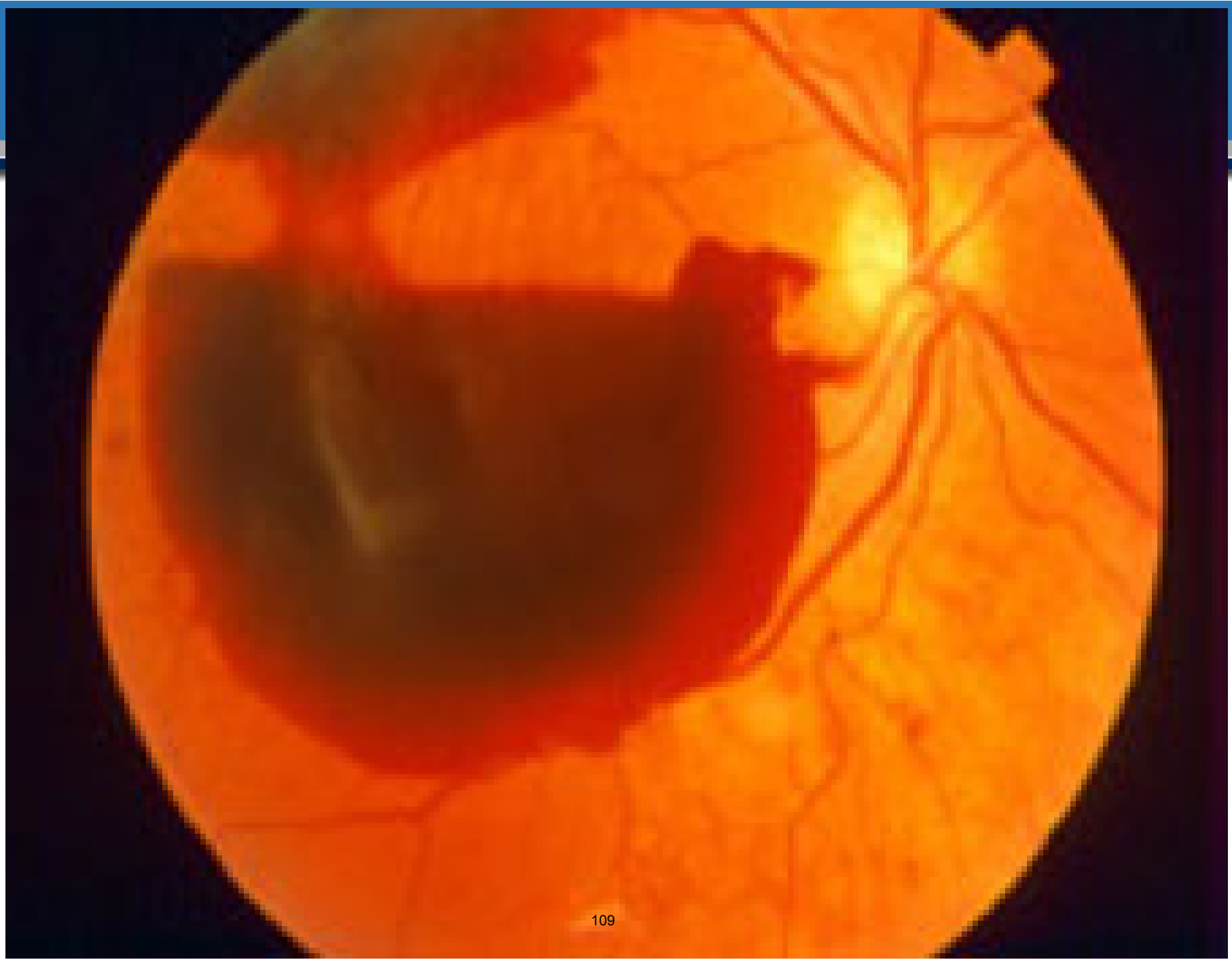


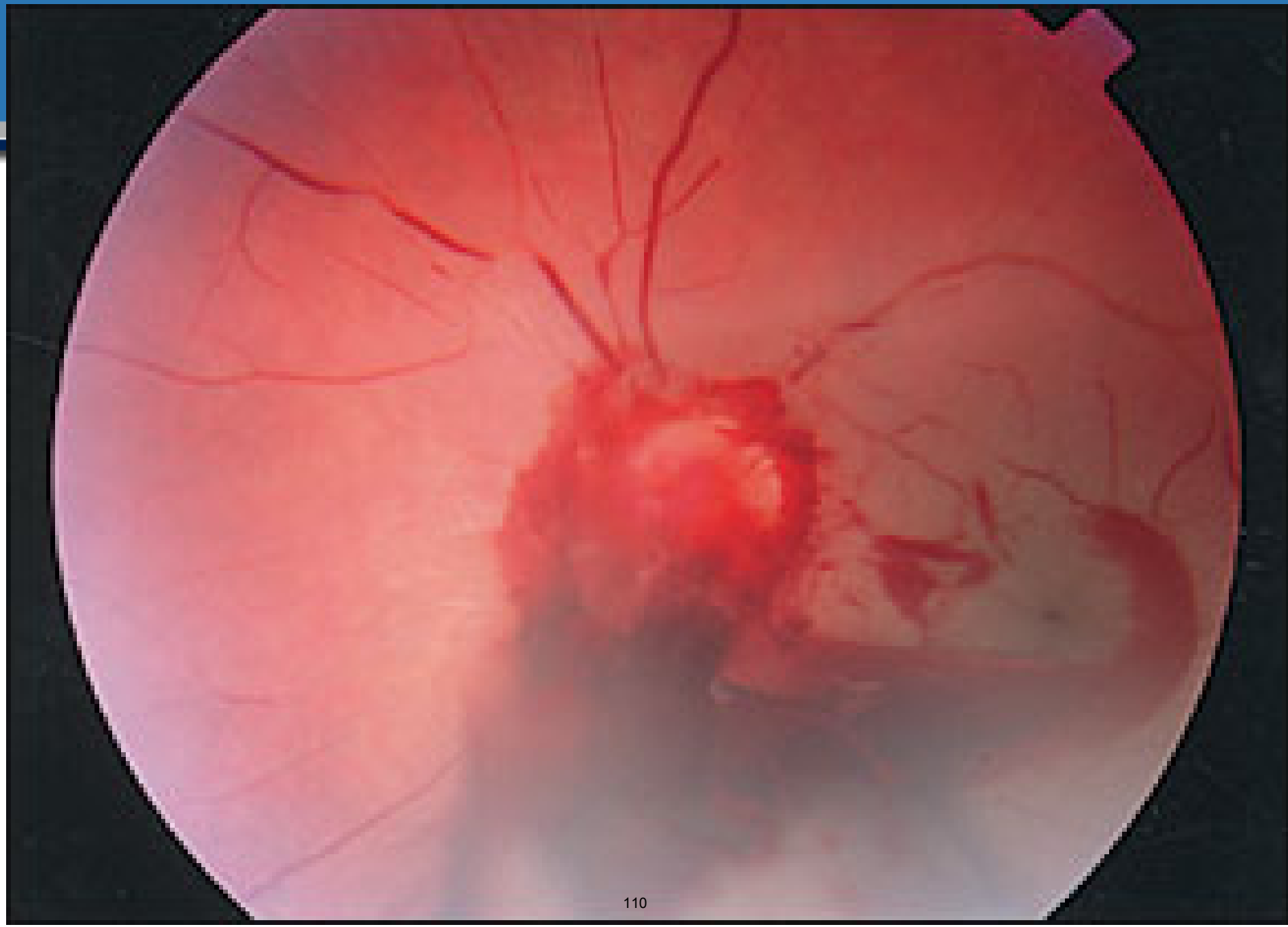

RT EYE
TRANS
2.5

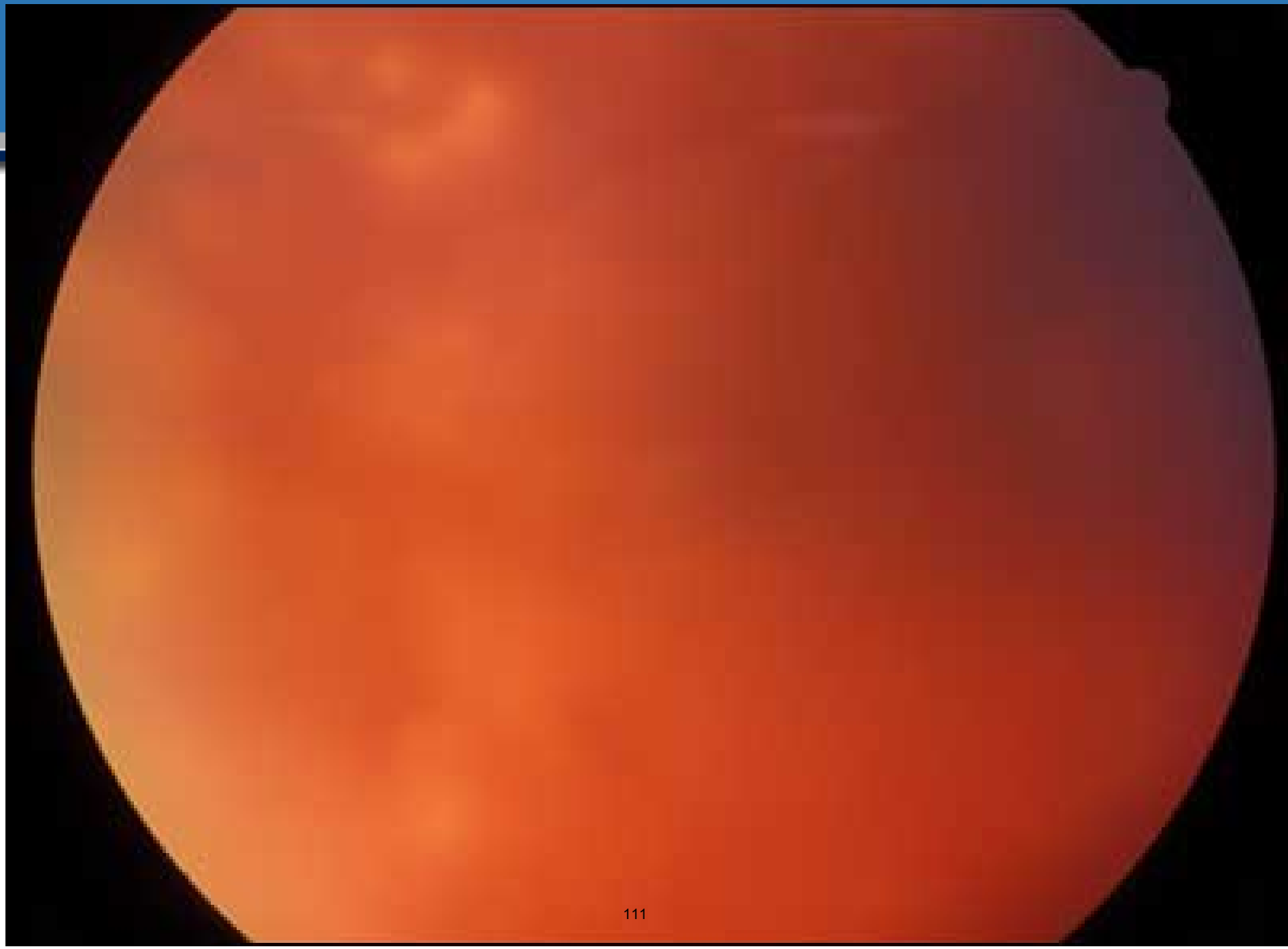
TRAUMATIC CATARACT

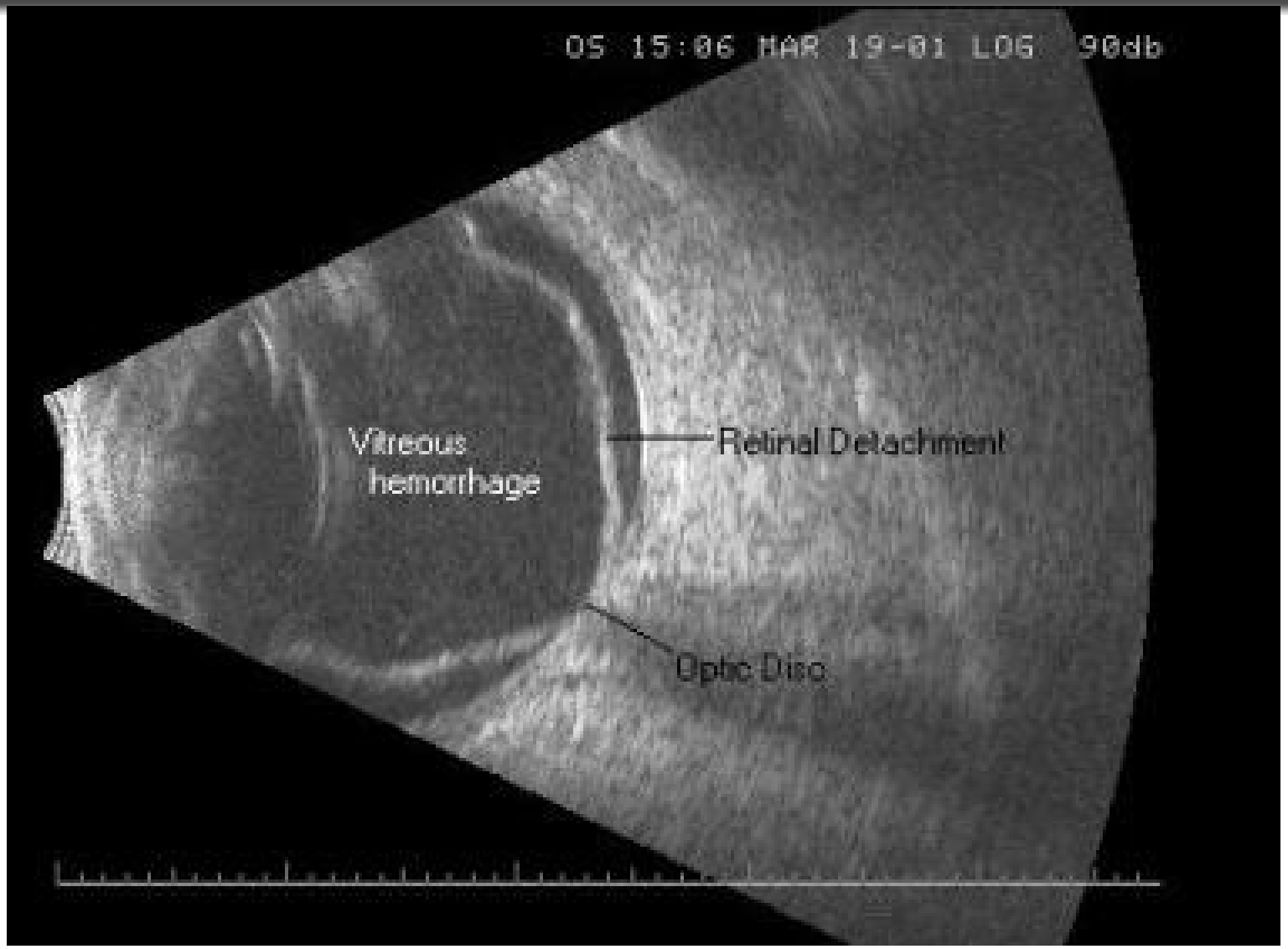
- Cataracts that are not subluxated and with intact capsule - IOL
- Subluxation , dislocated, ruptured capsule - vitrectomy and lensectomy
- Secondary sutured IOL in cases requiring lensectomy





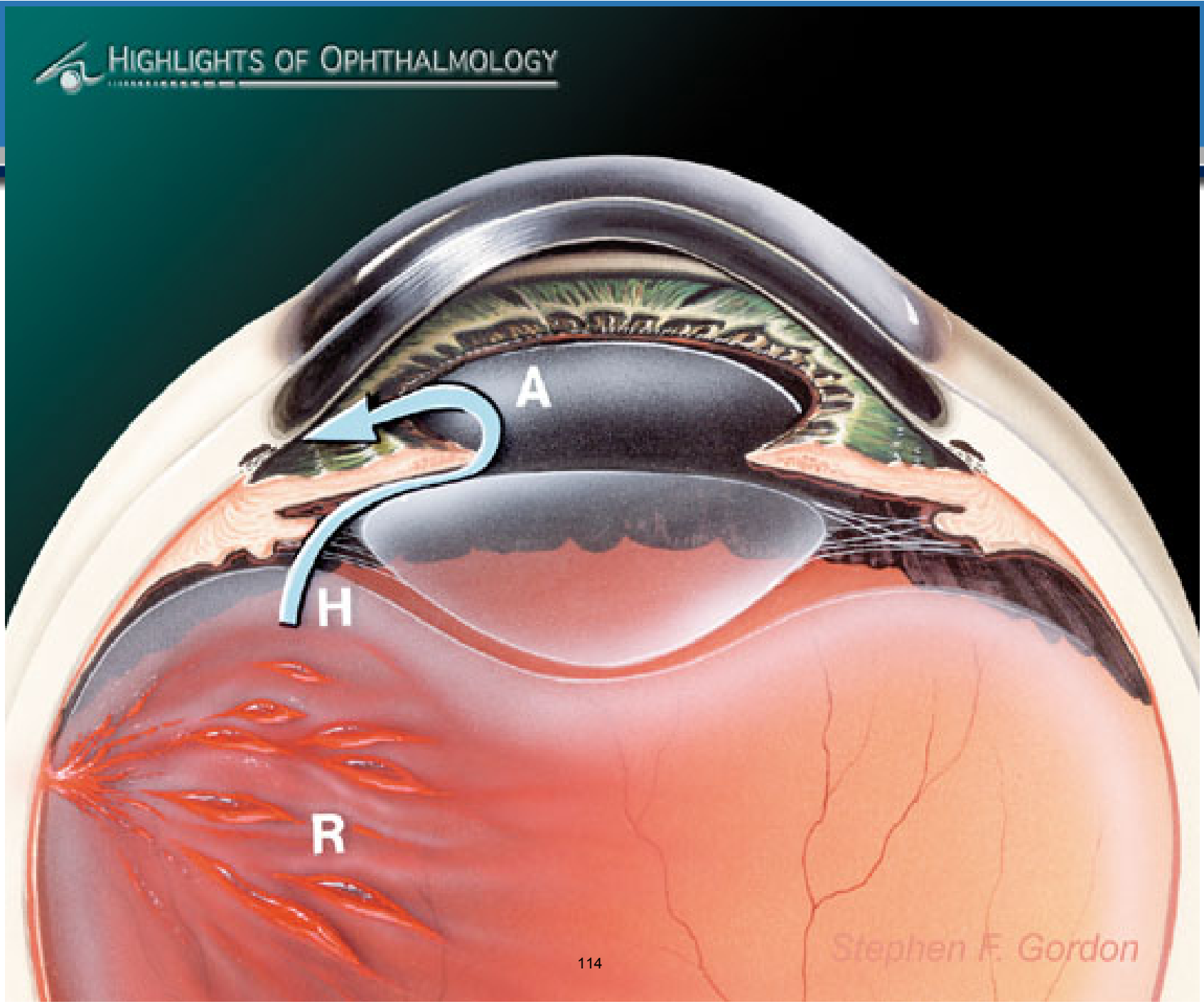


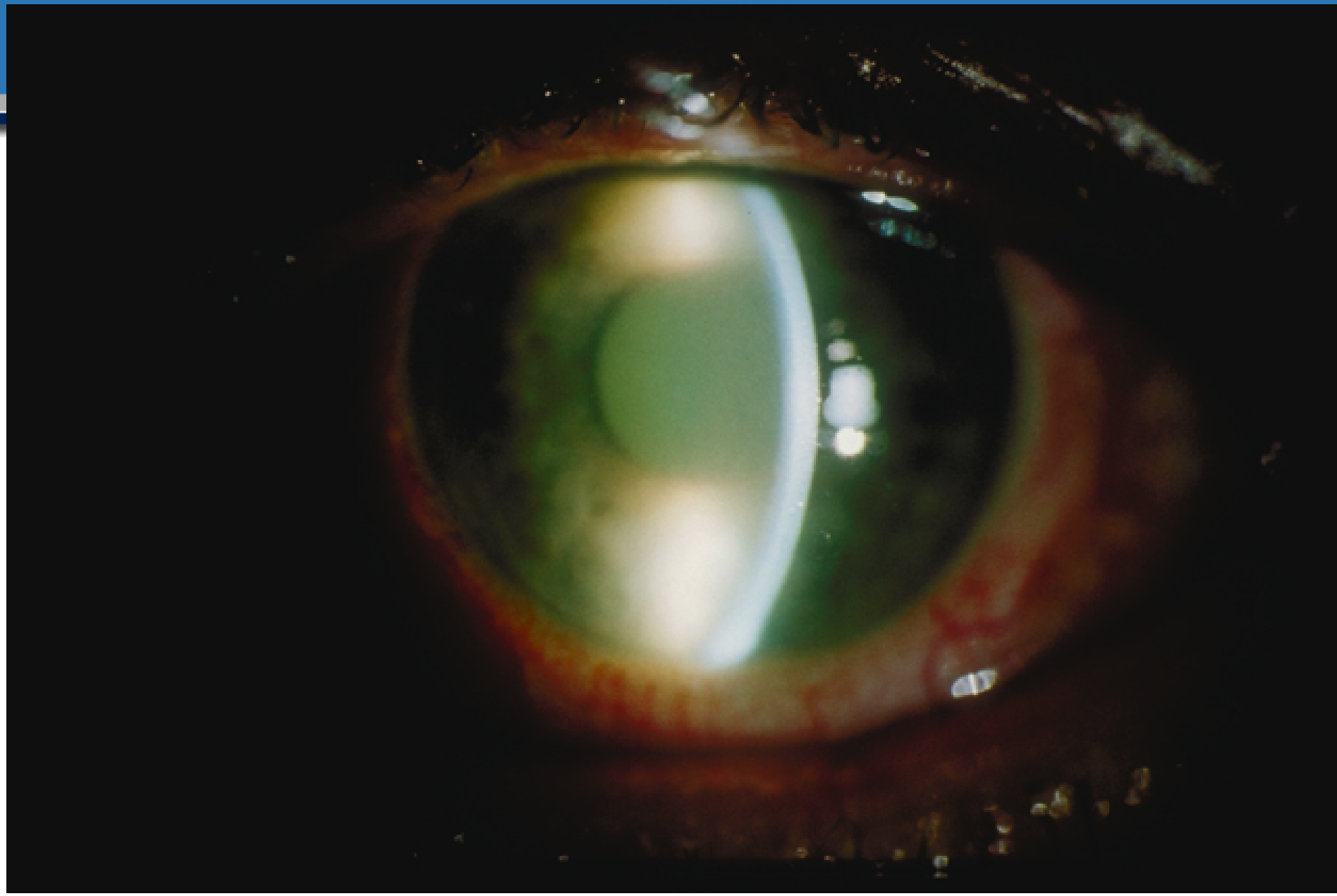


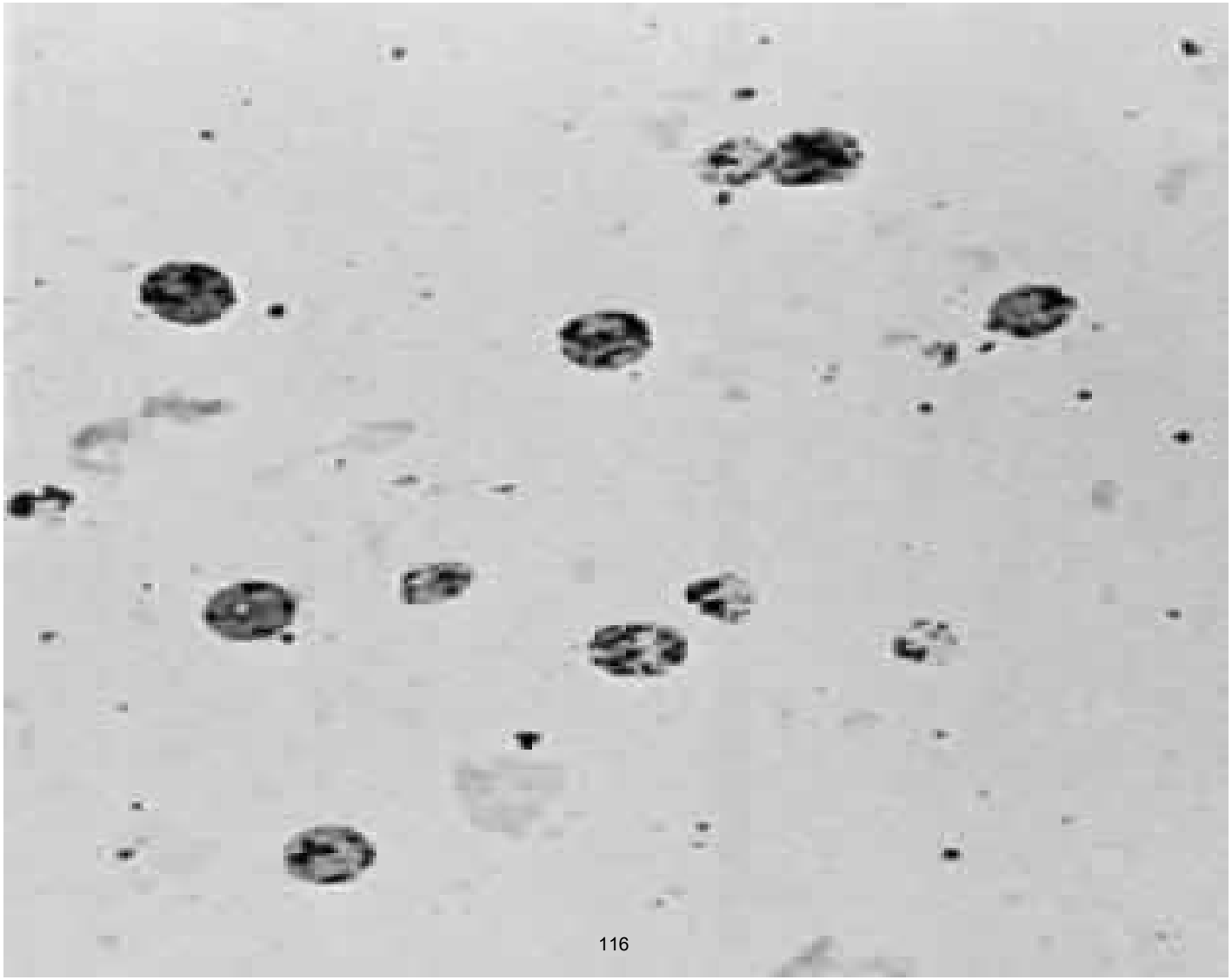

OS 15:06 MAR 19-01 LOG 90db
Vitreous hemorrhage
Retinal Detachment
Optic Disc

VITREOUS HEMORRHAGE

- Vitrectomy indicated for nonclearing hemorrhages
- Prompt vitrectomy for hemorrhages associated with retinal detachment , uncontrolled ghost cell glaucoma, ruptured lens , vitreous traction threatening macula
- Laser for some cases of subhyloid hemorrhage

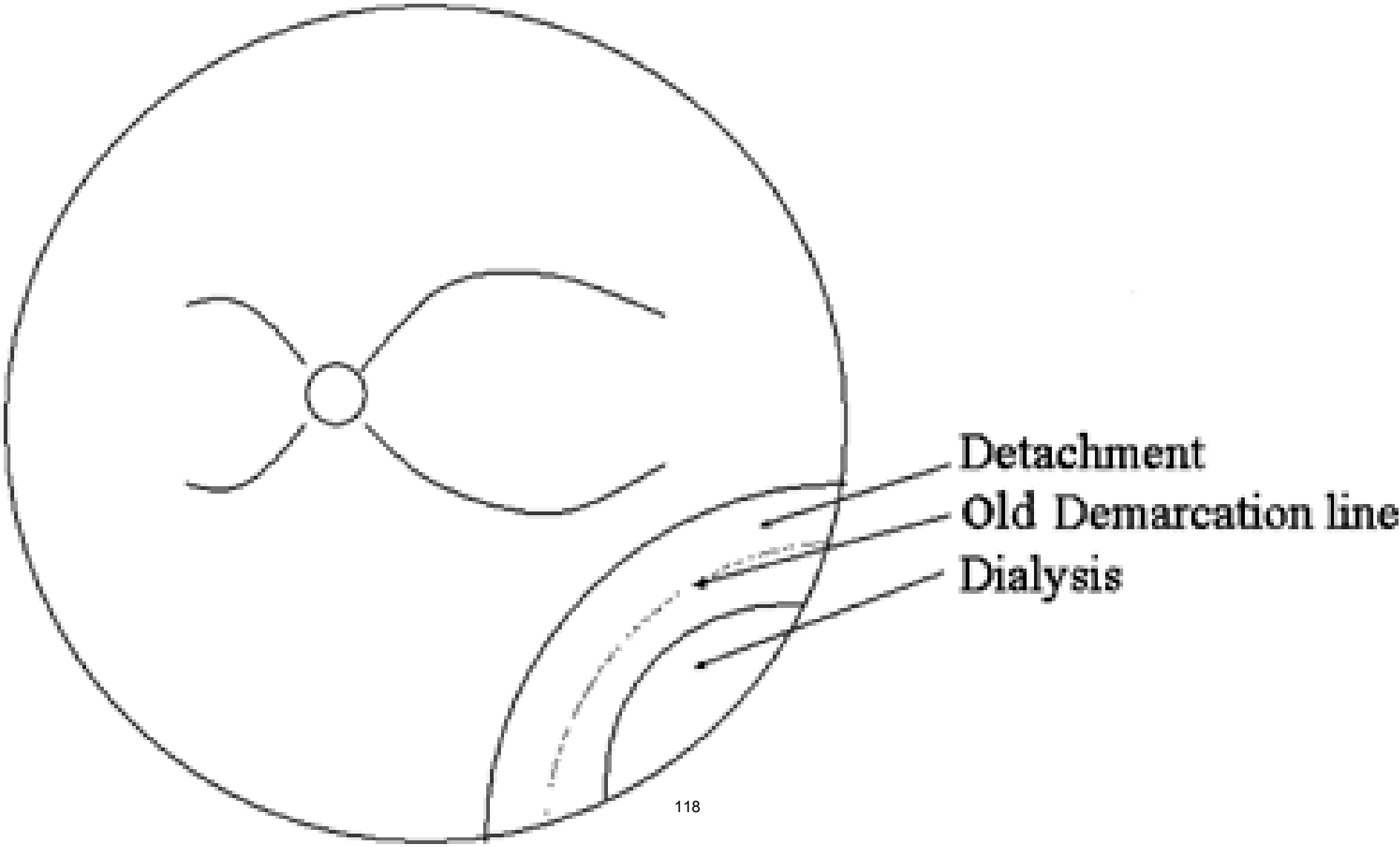

A
H
R
Stephen F. Gordon

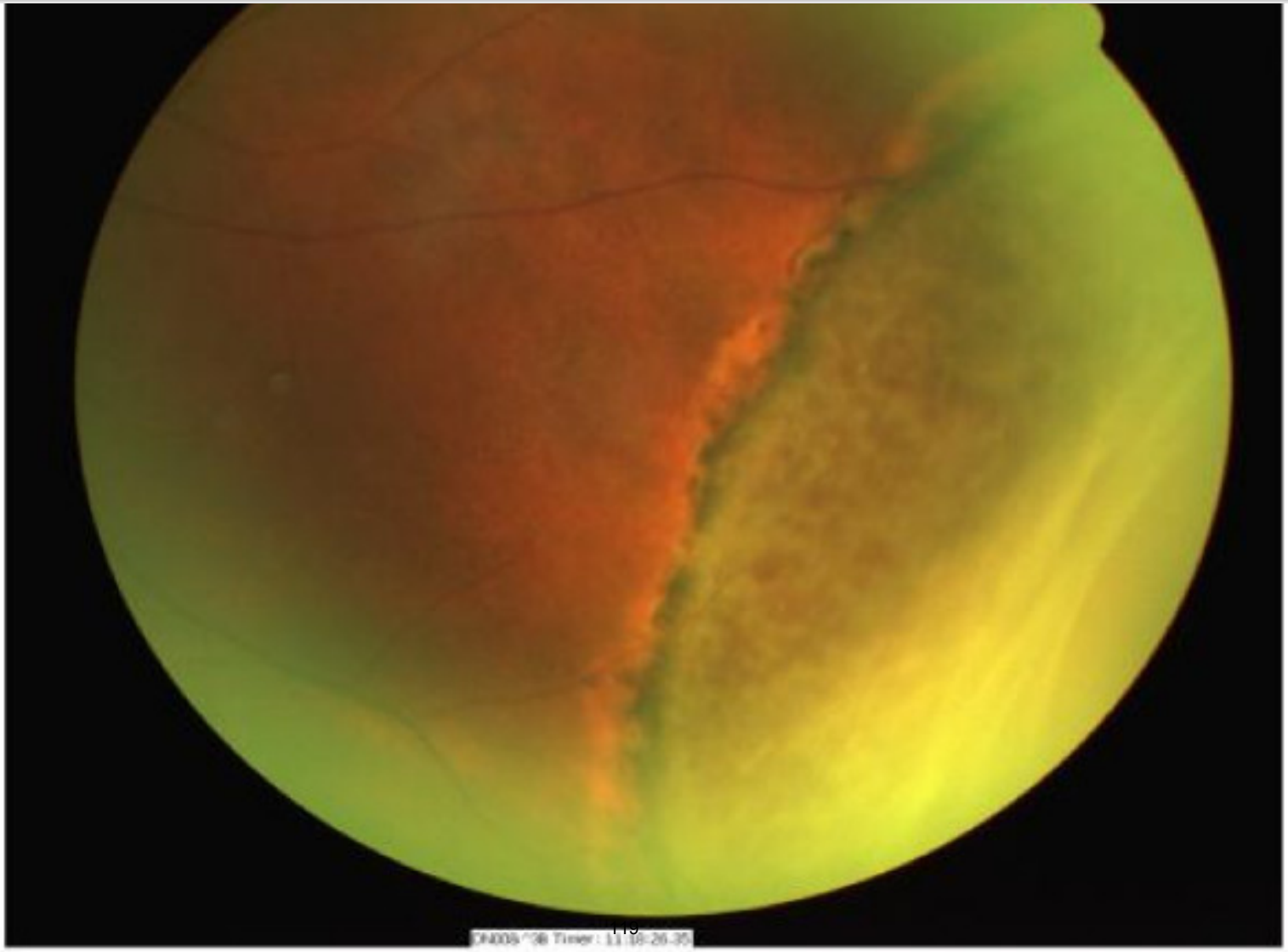


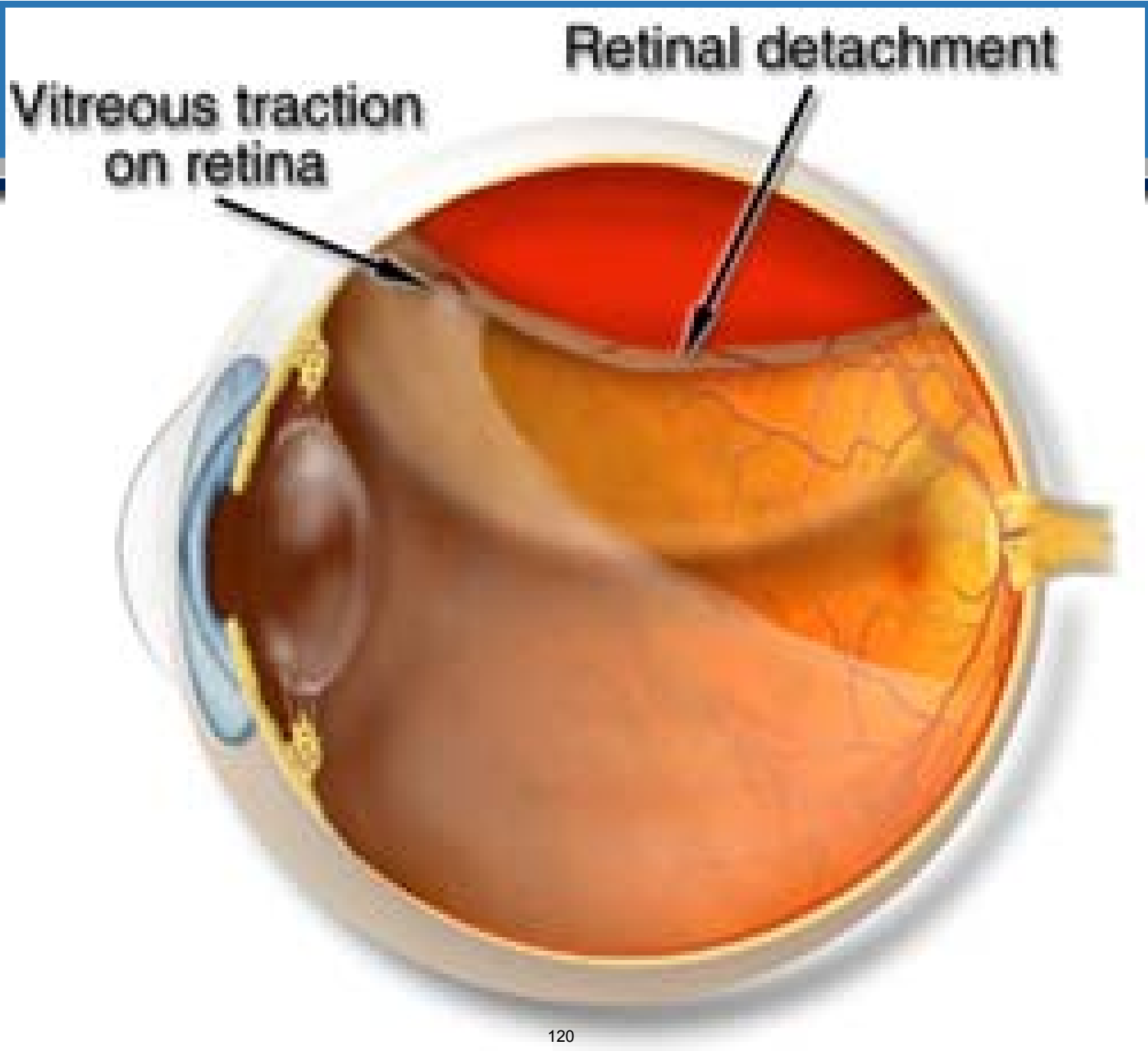


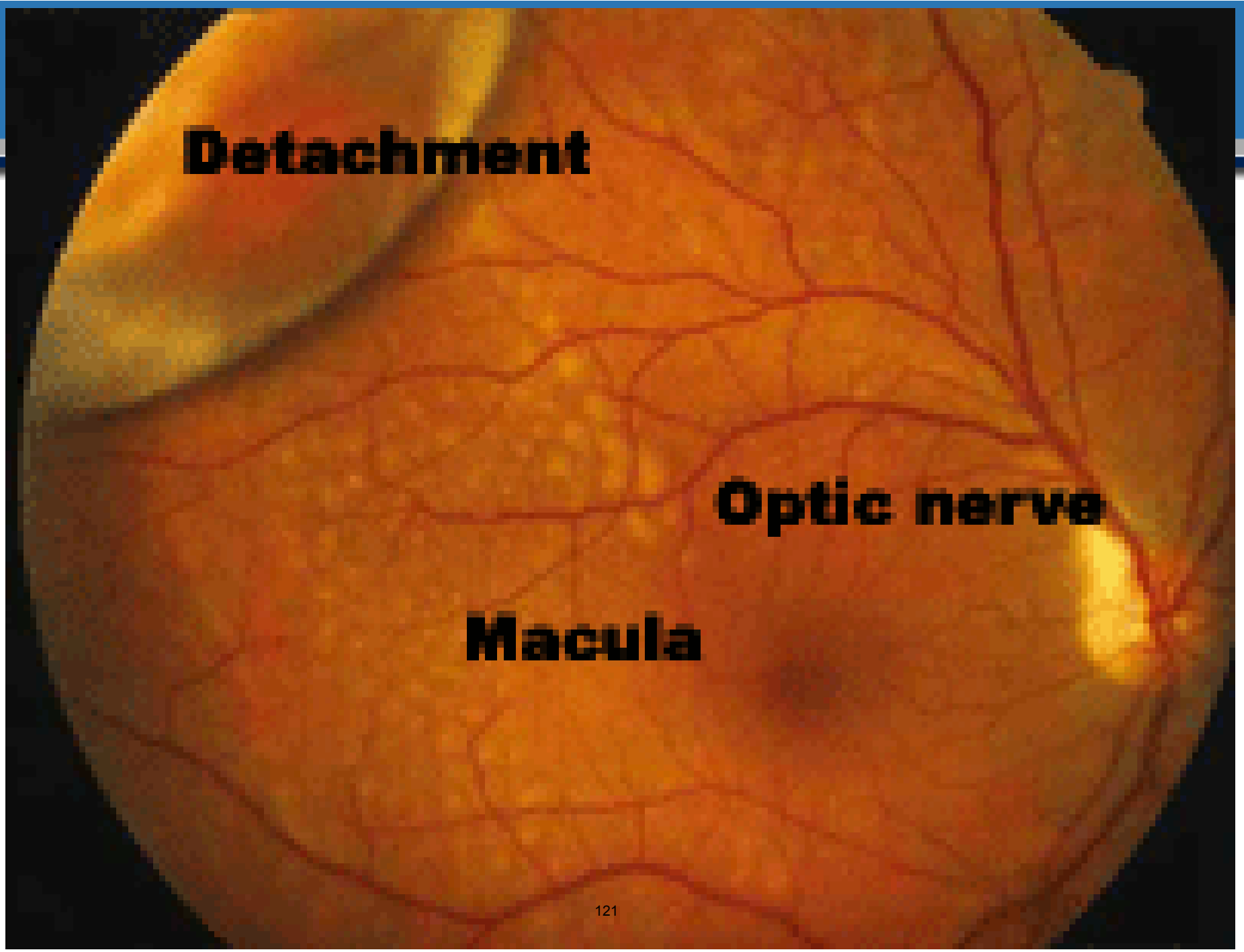
GHOST CELL GLAUCOMA

- Anti glaucoma medication
- Anterior chamber washout
- Vitrectomy
- Continue anti glaucoma medications after removal of ghost cells.


Detachment
Old Demarcation line
Dialysis

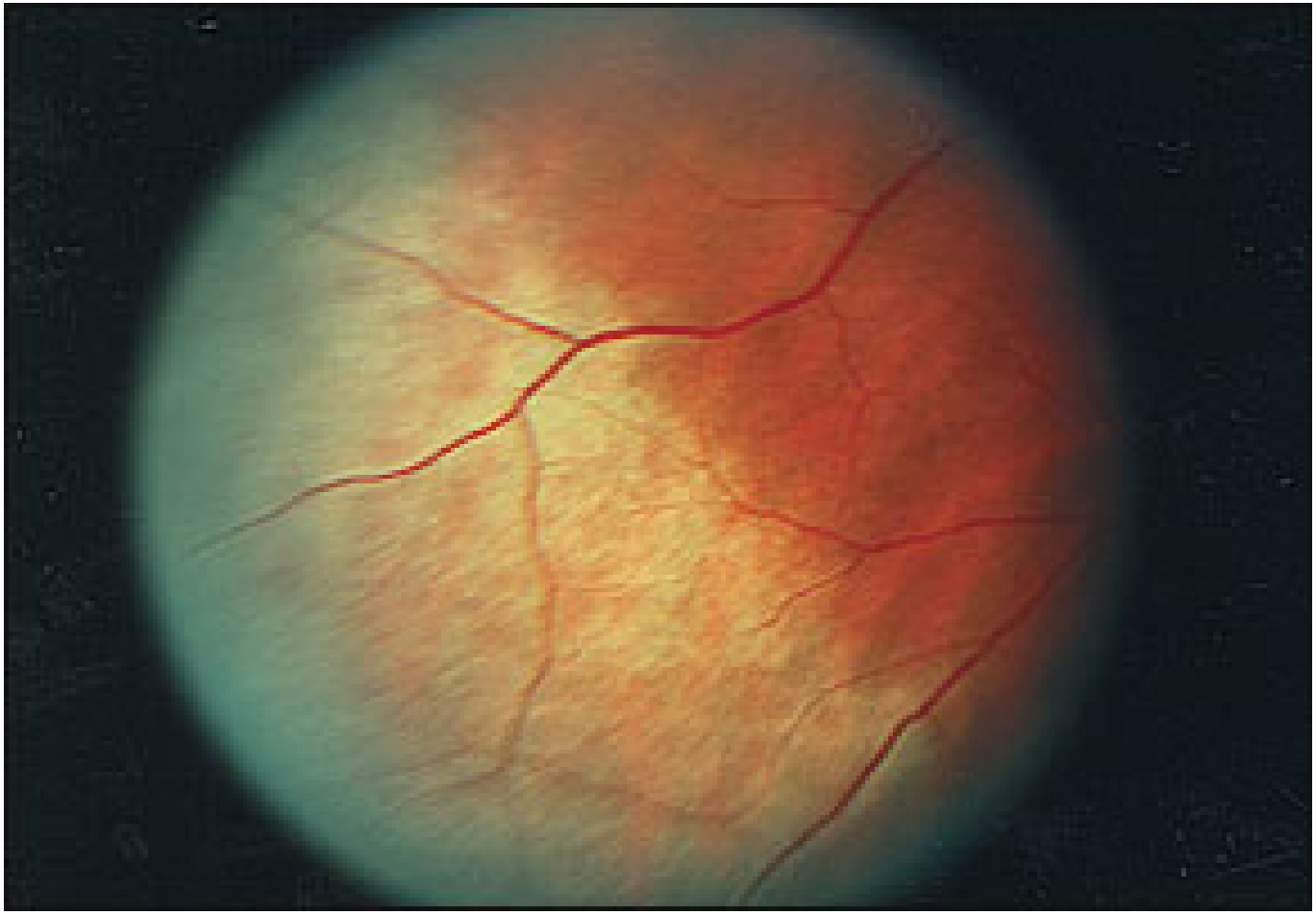



Retinal detachment
Vitreous traction
on retina


Detachment
Optic nerve
Macula

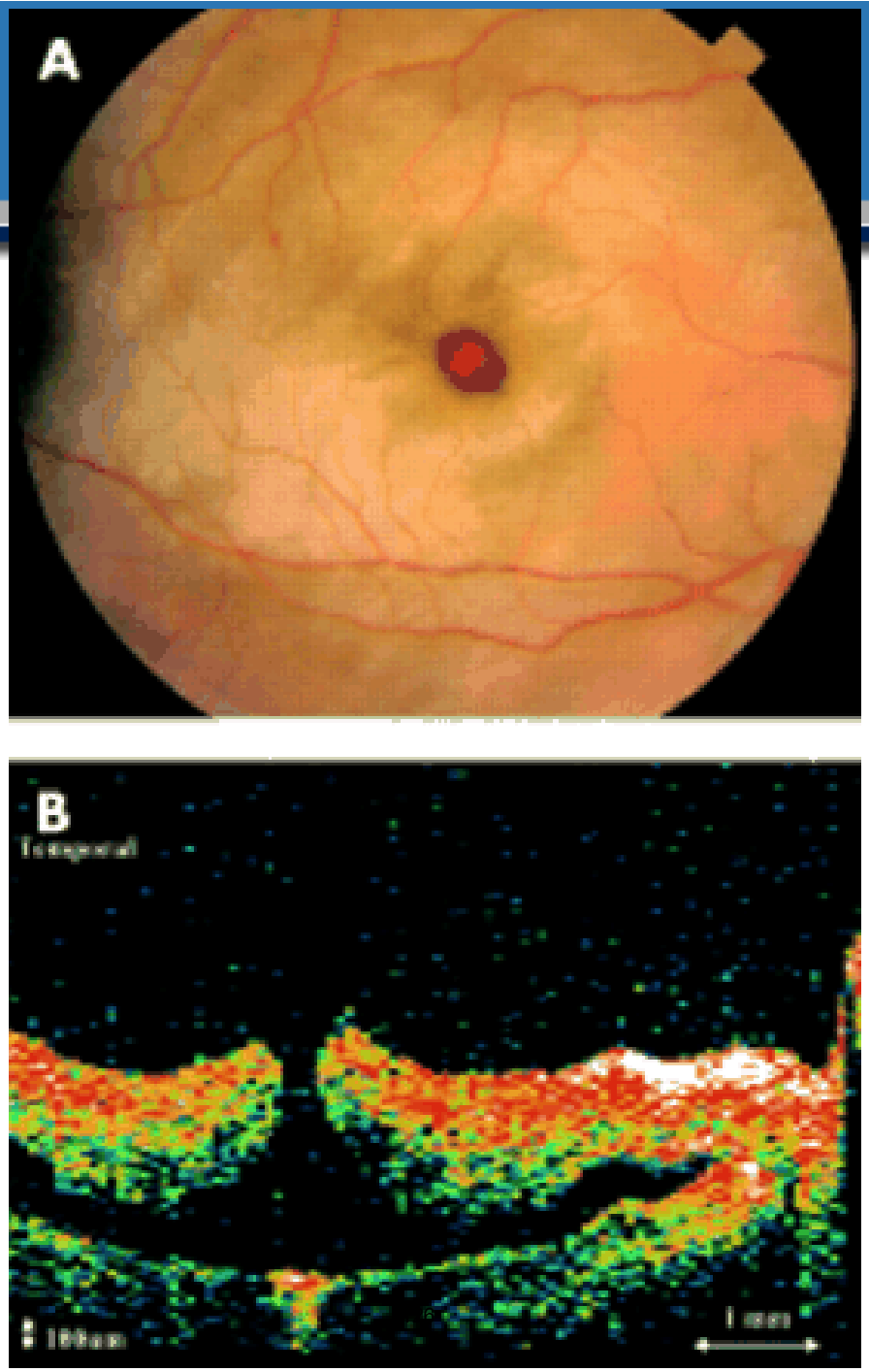
RETINAL DETACHMENT

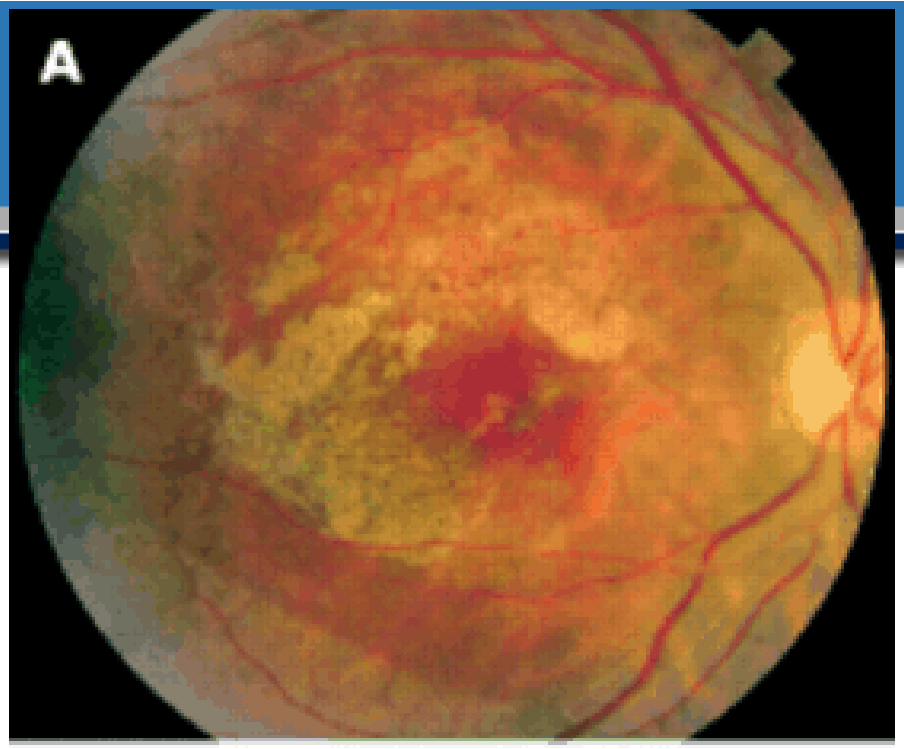
- Pneumatic retinopexy
- Scleral buckle
- Vitrectomy

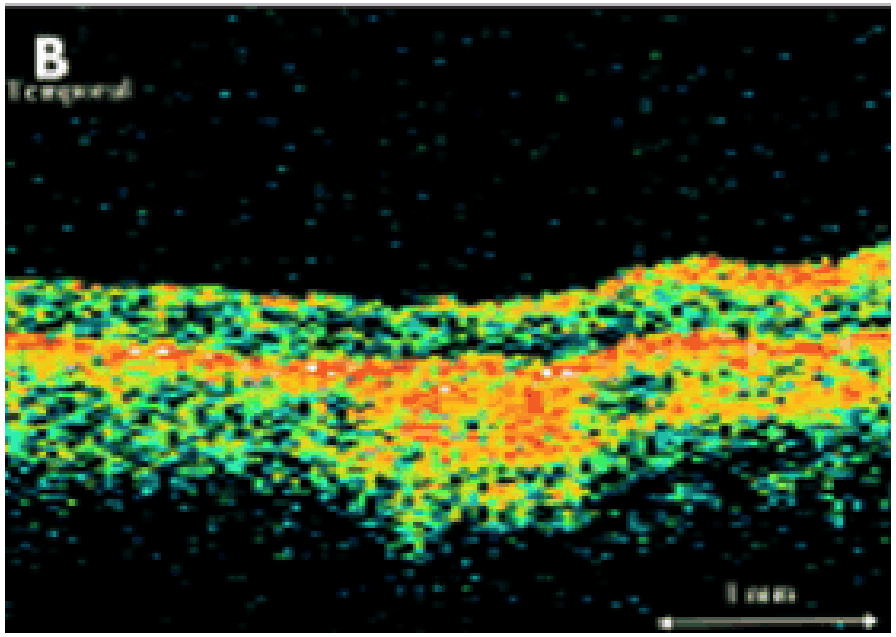


Commotio Retina

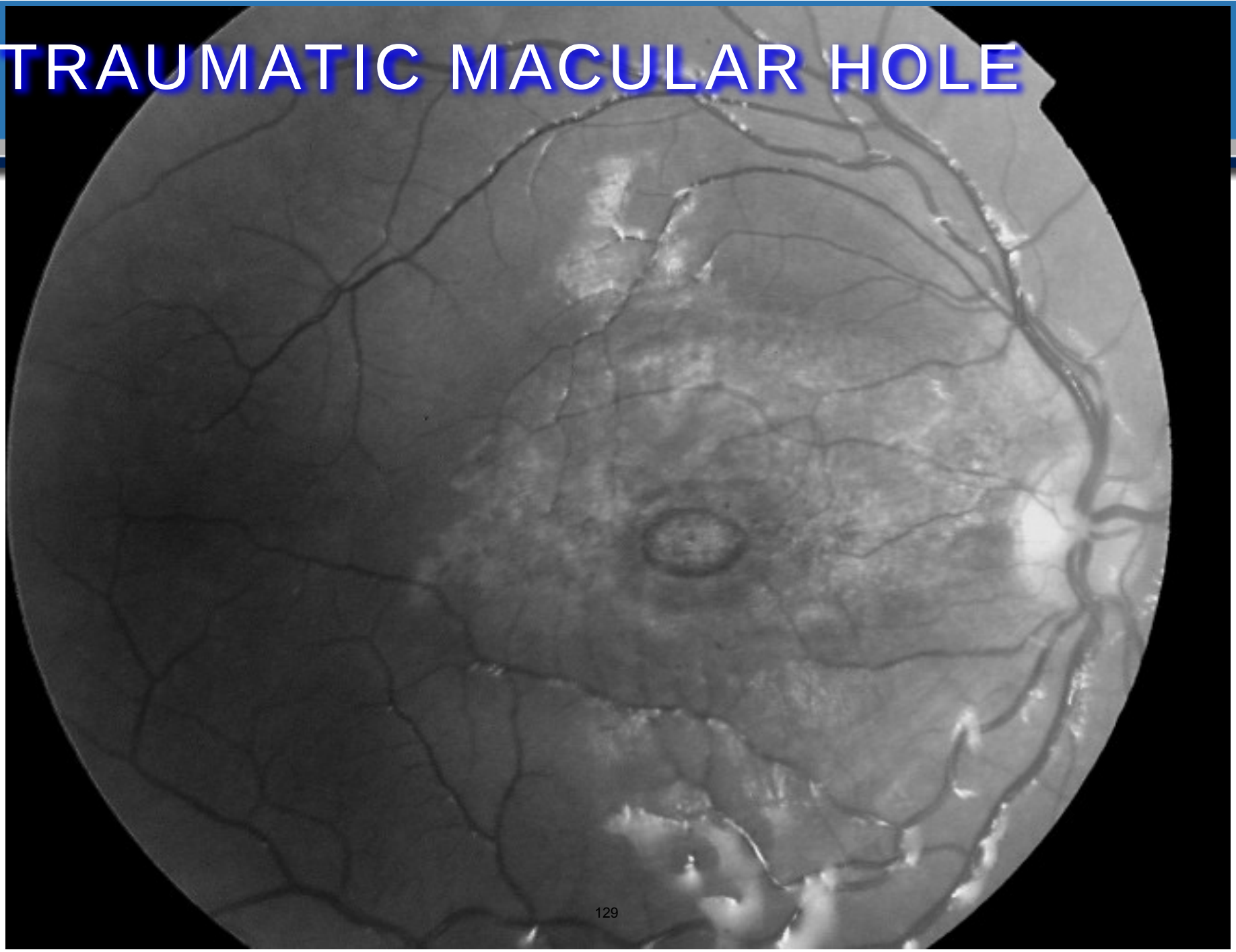
- Extra cellular edema, glial swelling, photoreceptor outer segment swelling.
- When macula affected may have cherry red spot or yellow color. Sometimes called Berlins edema.
- Prognosis most often good. Resolves in 3 – 4 weeks.
- Complications can include macular hole, choroidal rupture, retinal pigment dysfunction and vision less then 20/200.
- No proven acute treatment


A
B


A

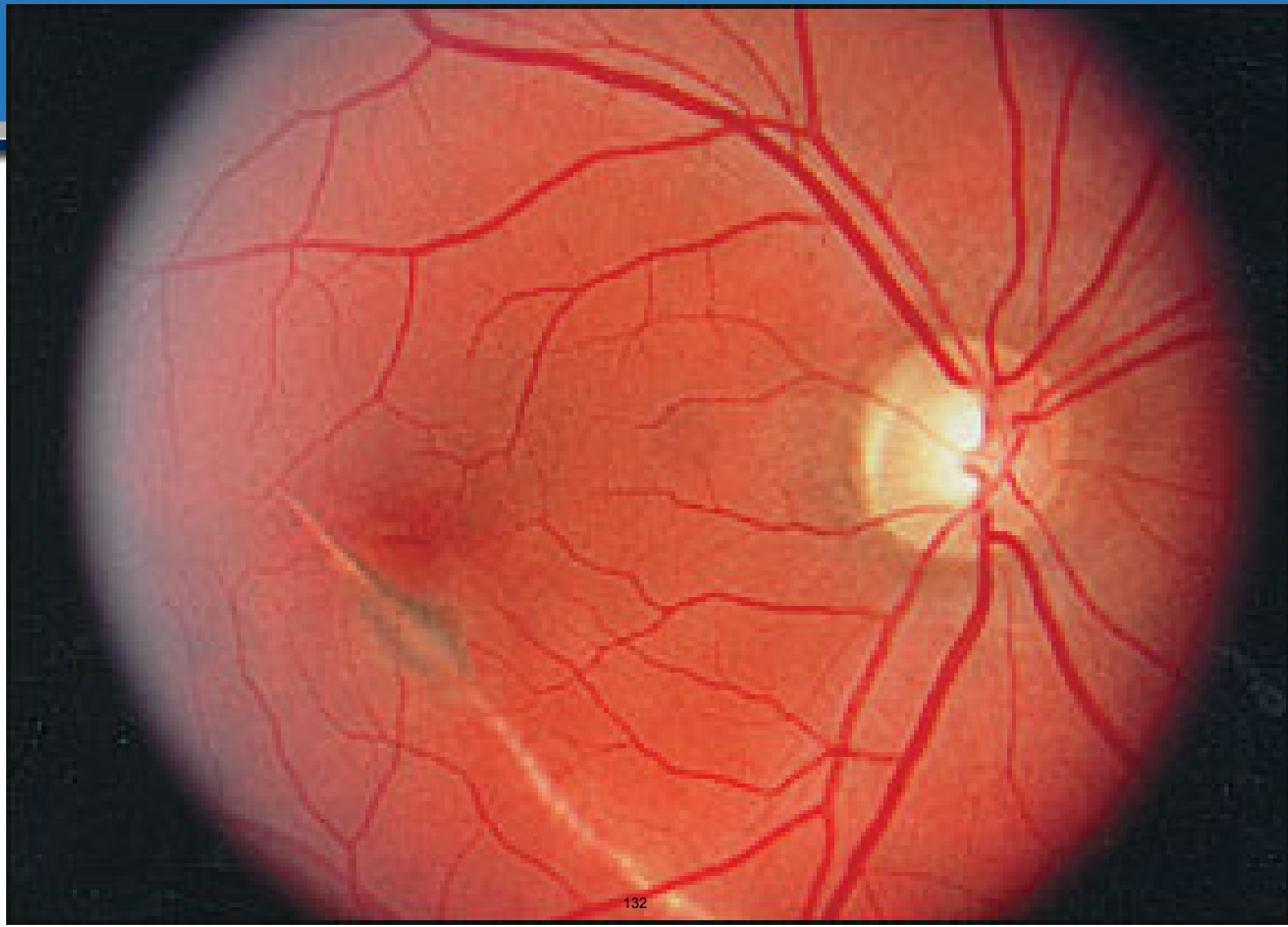

B

TRAUMATIC MACULAR HOLE



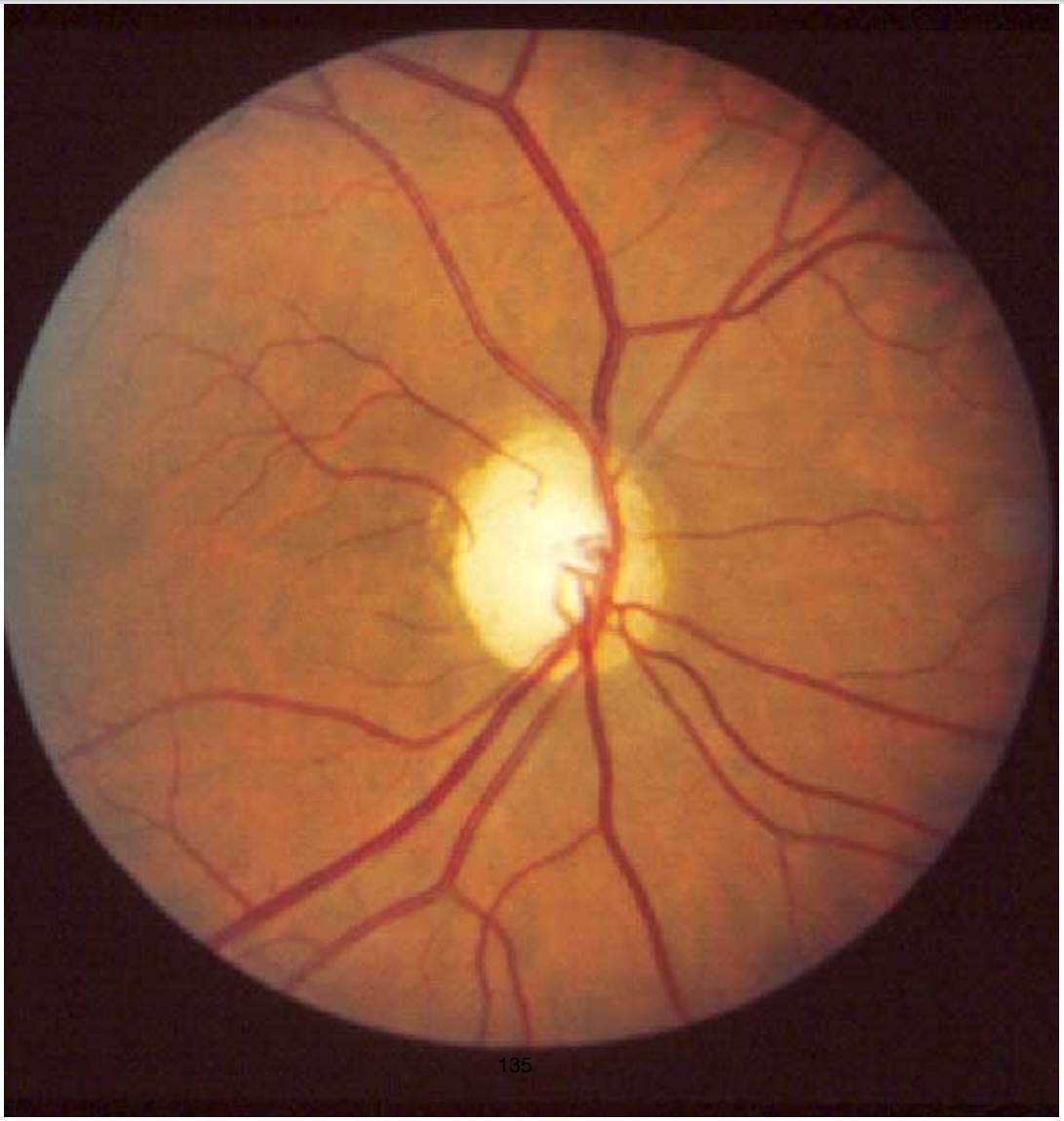
MACUALR HOLE

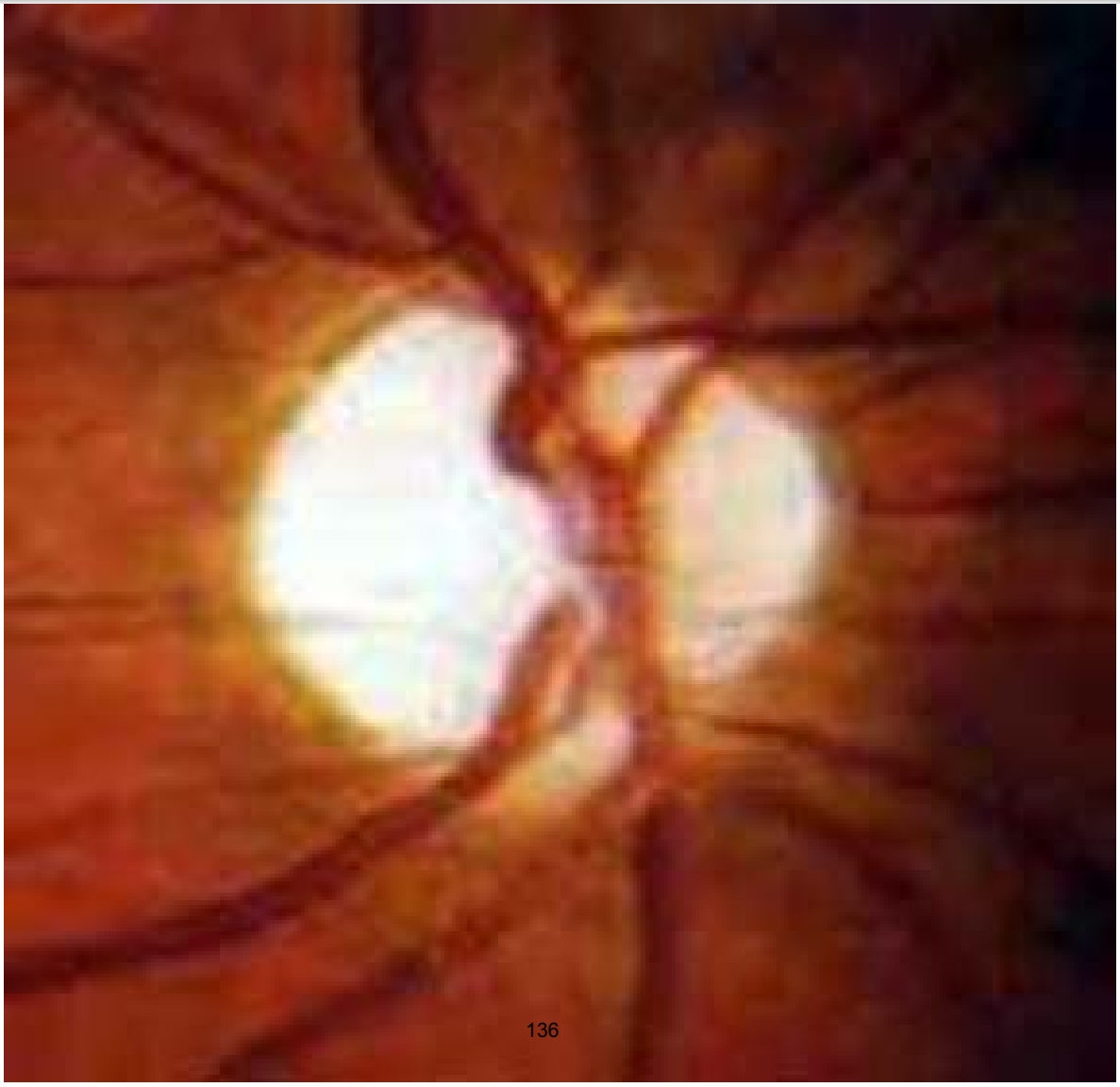
- Vitrectomy
- Gas bubble and face down
- Silicone oil



OPTIC NERVE INJURY

- Decreased central acuity, blurry vision, scotomas
- Decreased color vision
- Afferent pupillary defect
- Visual field defect
- Normal appearance initially with atrophy developing in 3 – 6 weeks





OPTIC NERVE INJURY

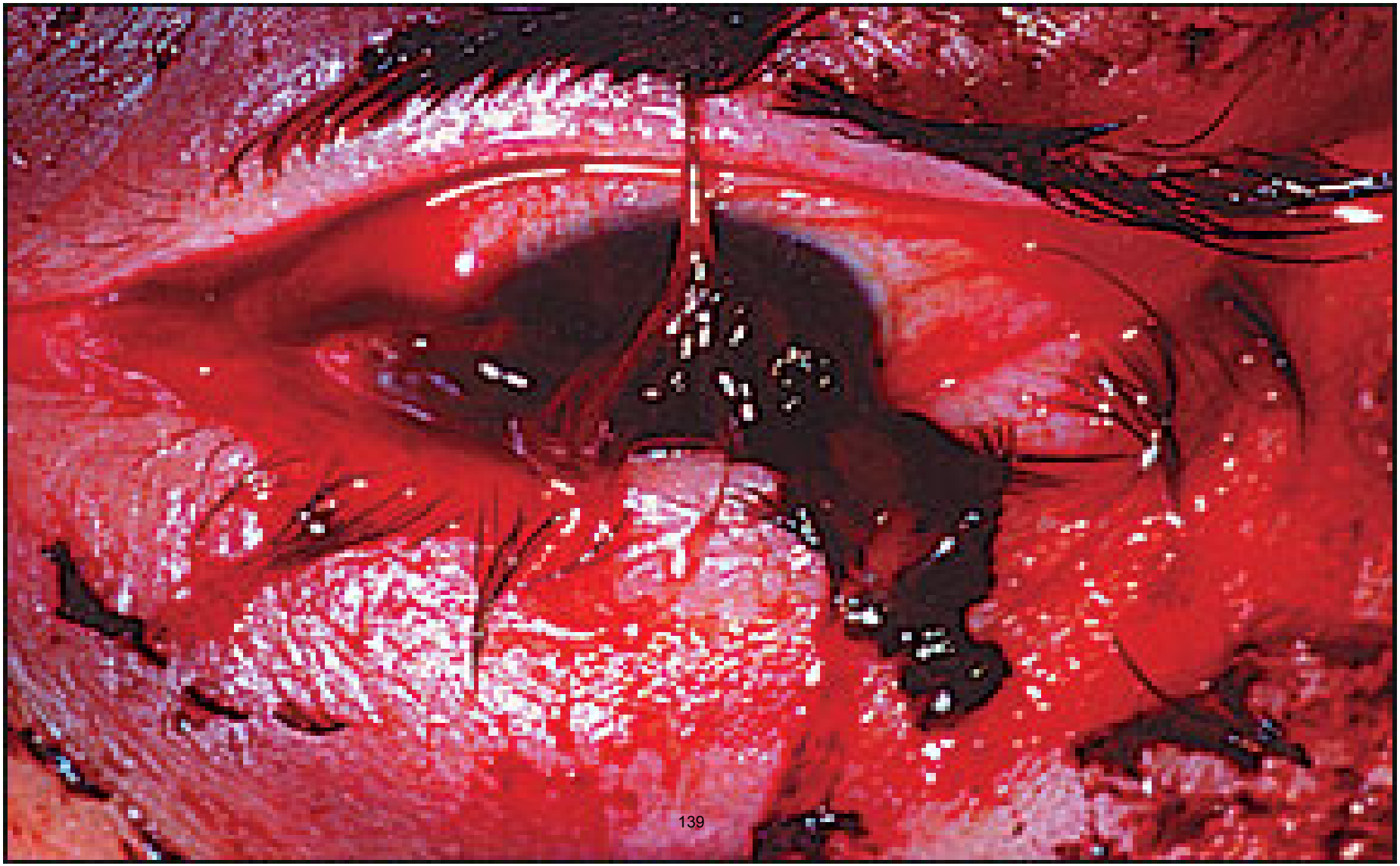
- The treatment of traumatic optic neuropathy: the International optic nerve trauma study Ophthalmology ; 2000 may 107(5) : 814

  " No clear benefit was found for either corticosteroid Therapy or optic canal decompression surgery.

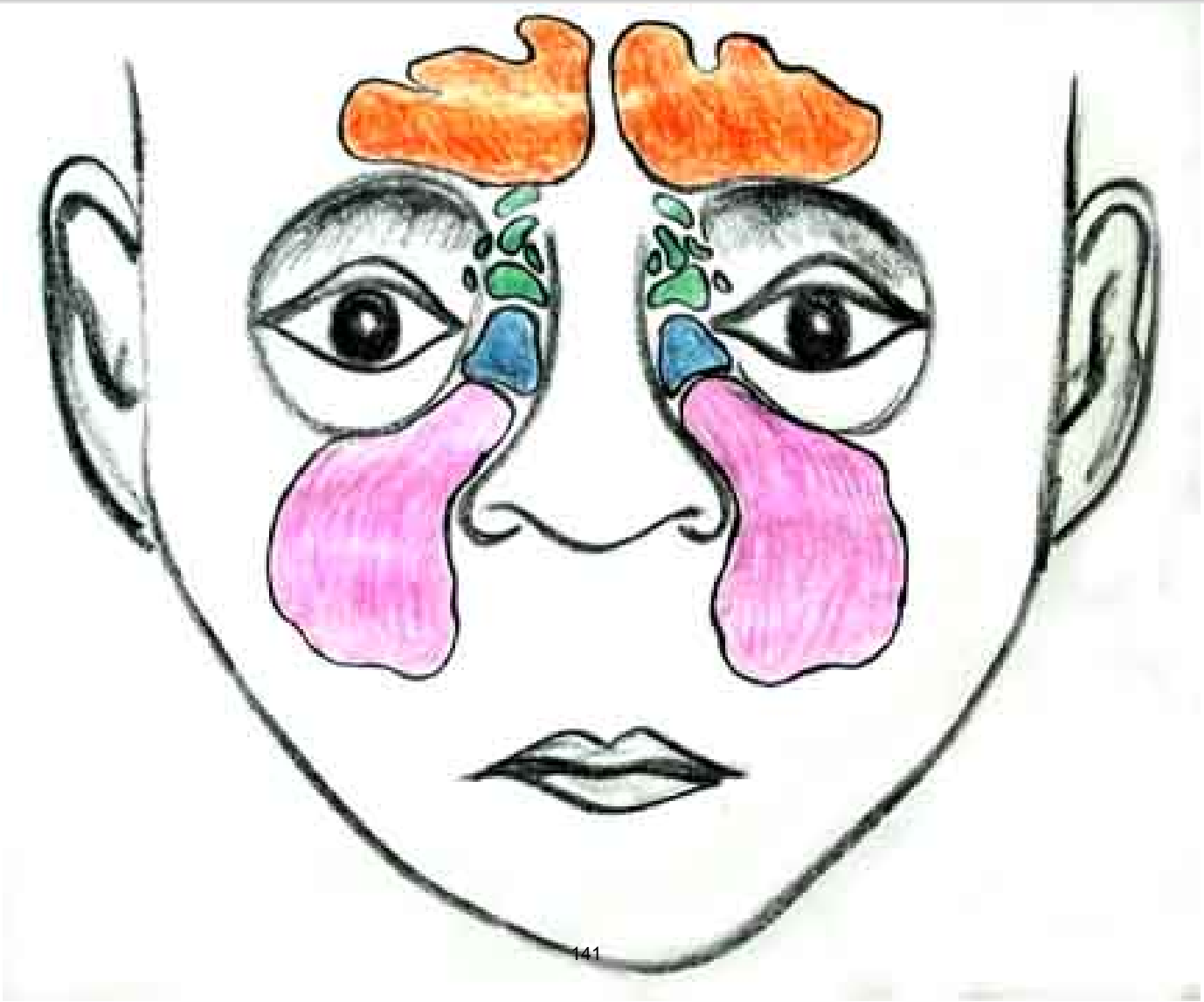
  These results and the existing literature provide sufficient evidence to conclude that neither…should Be considered the standard of care…reasonable to decide Treat or not treat on an individual patient basis."

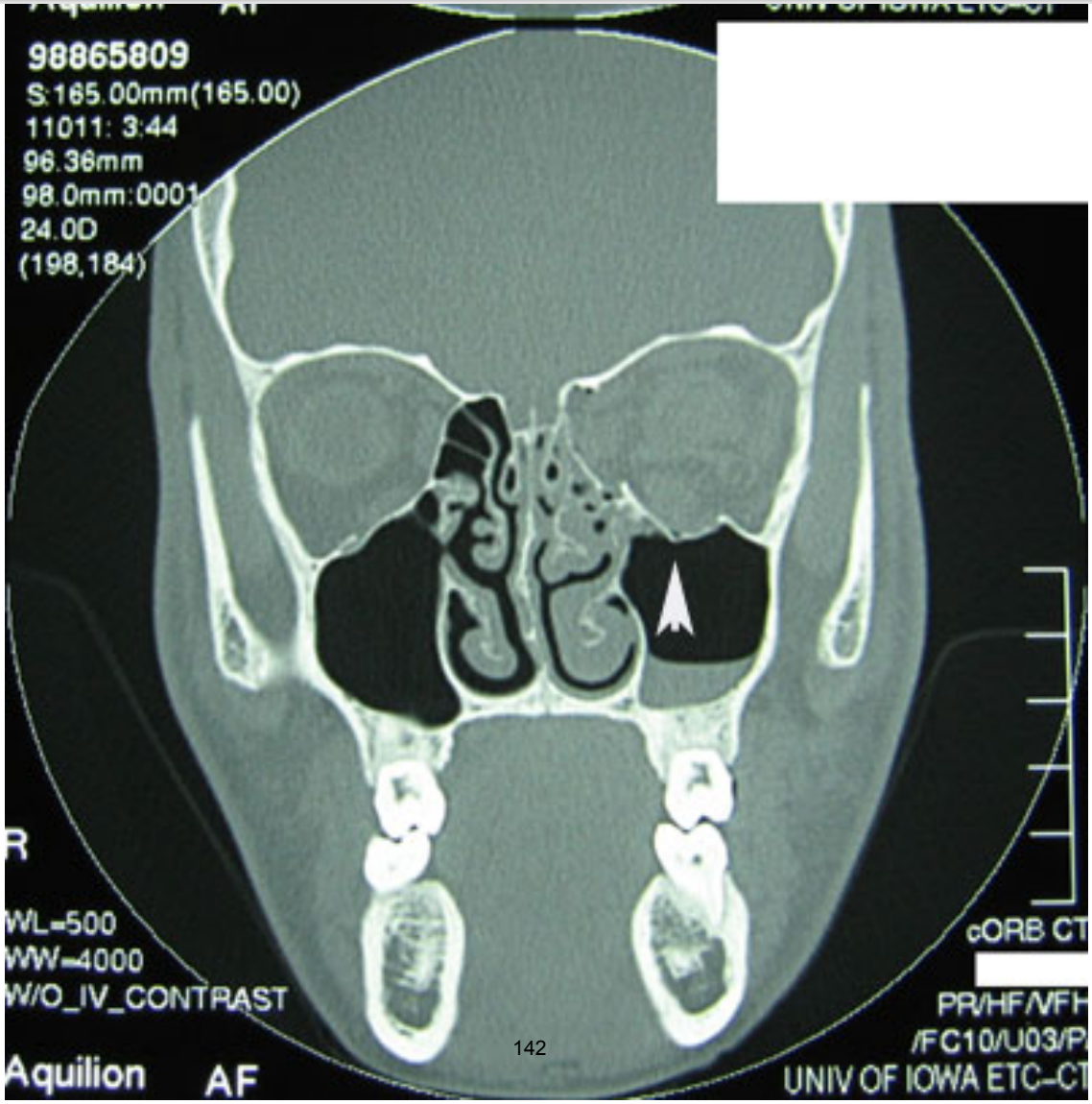
Optic Nerve Injury

- 2016 update of results of International optic nerve trauma study are unchanged.
- In addition steroids should not be in cases with concomitant traumatic brain injury or after 8 hours after injury.



ORBITAL FLOOR FRACTURE

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11011: 3:44
96.36mm
98.0mm:0001
24.0D
(198,184)
R
WL=500
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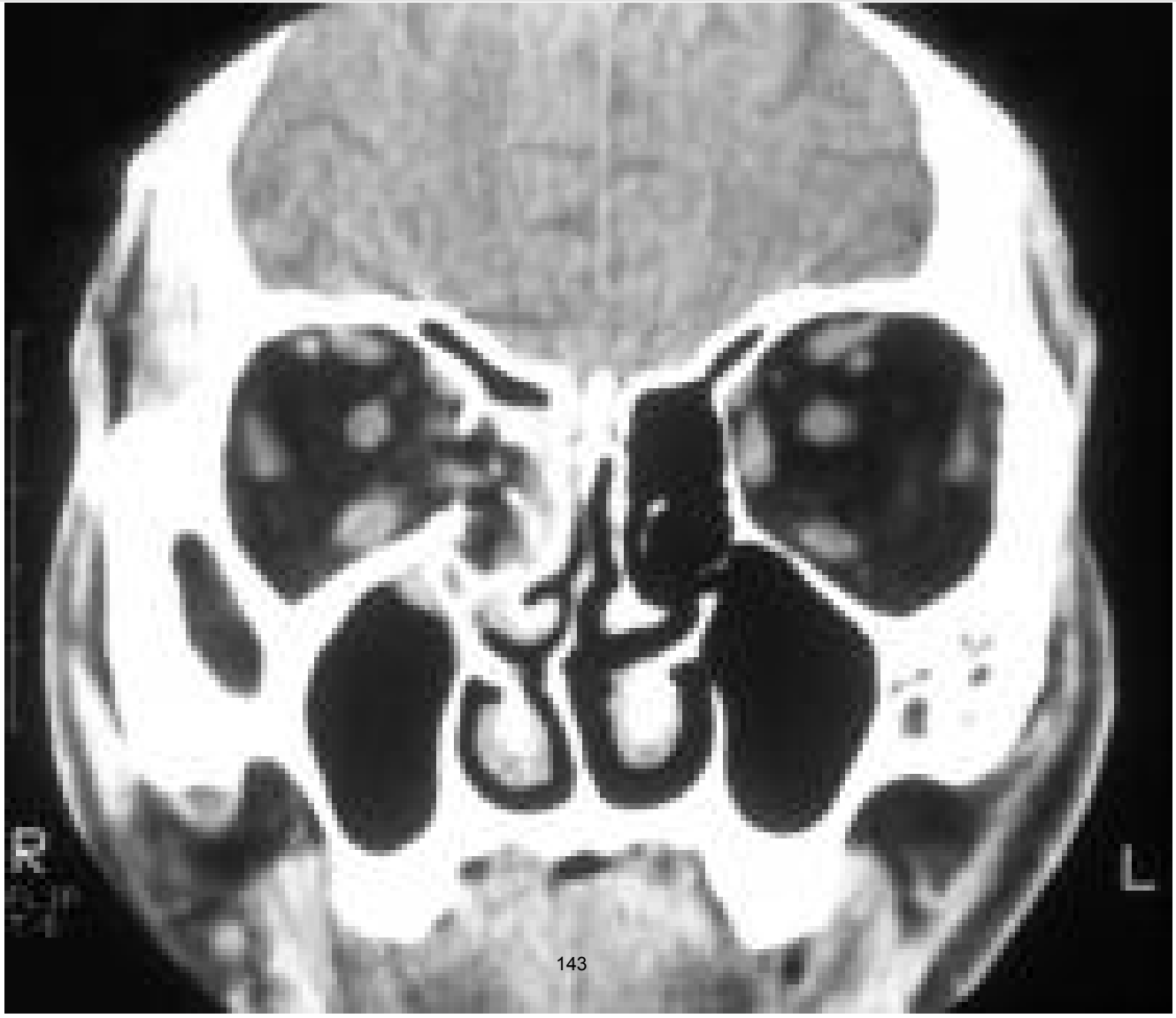
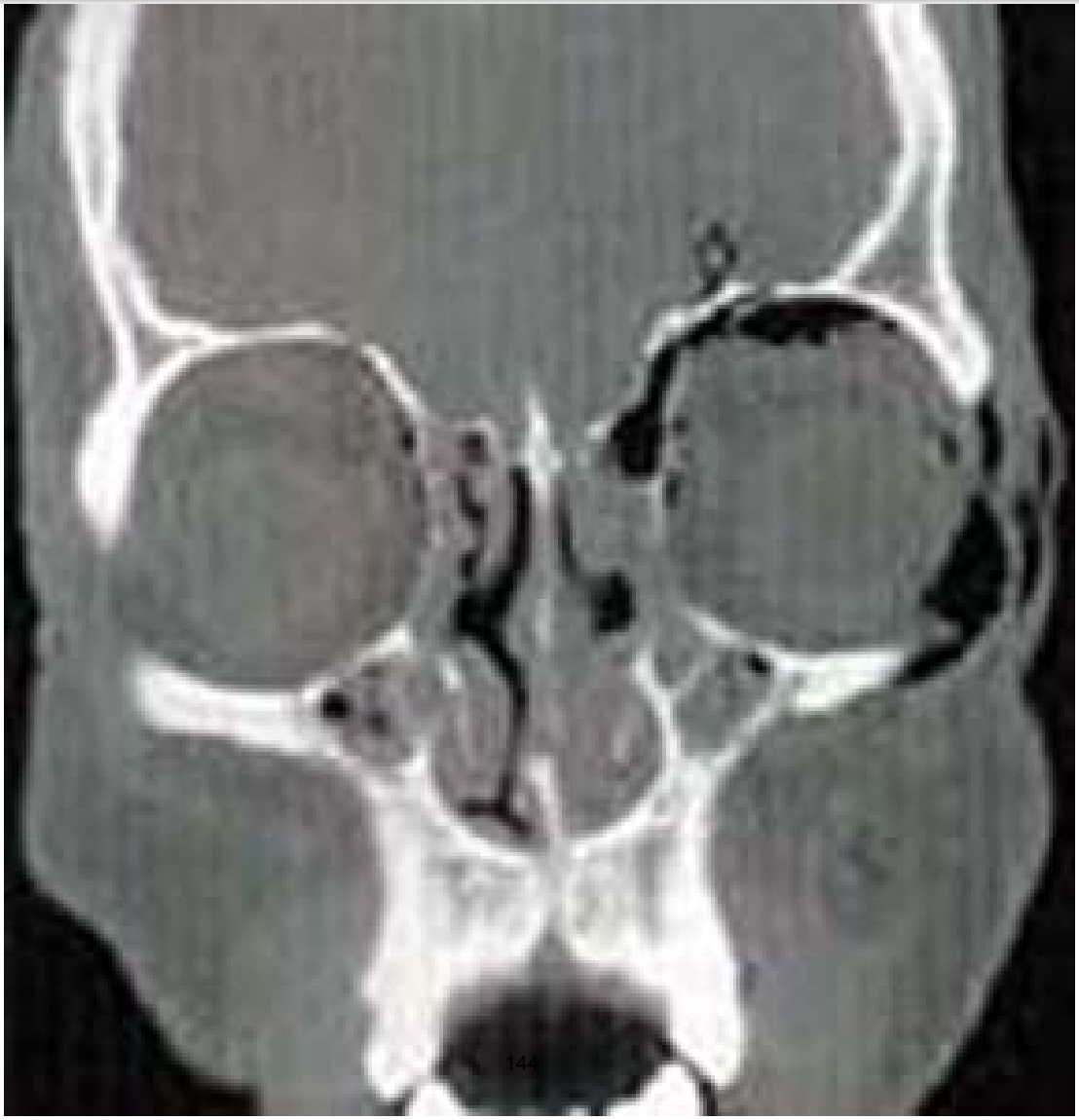
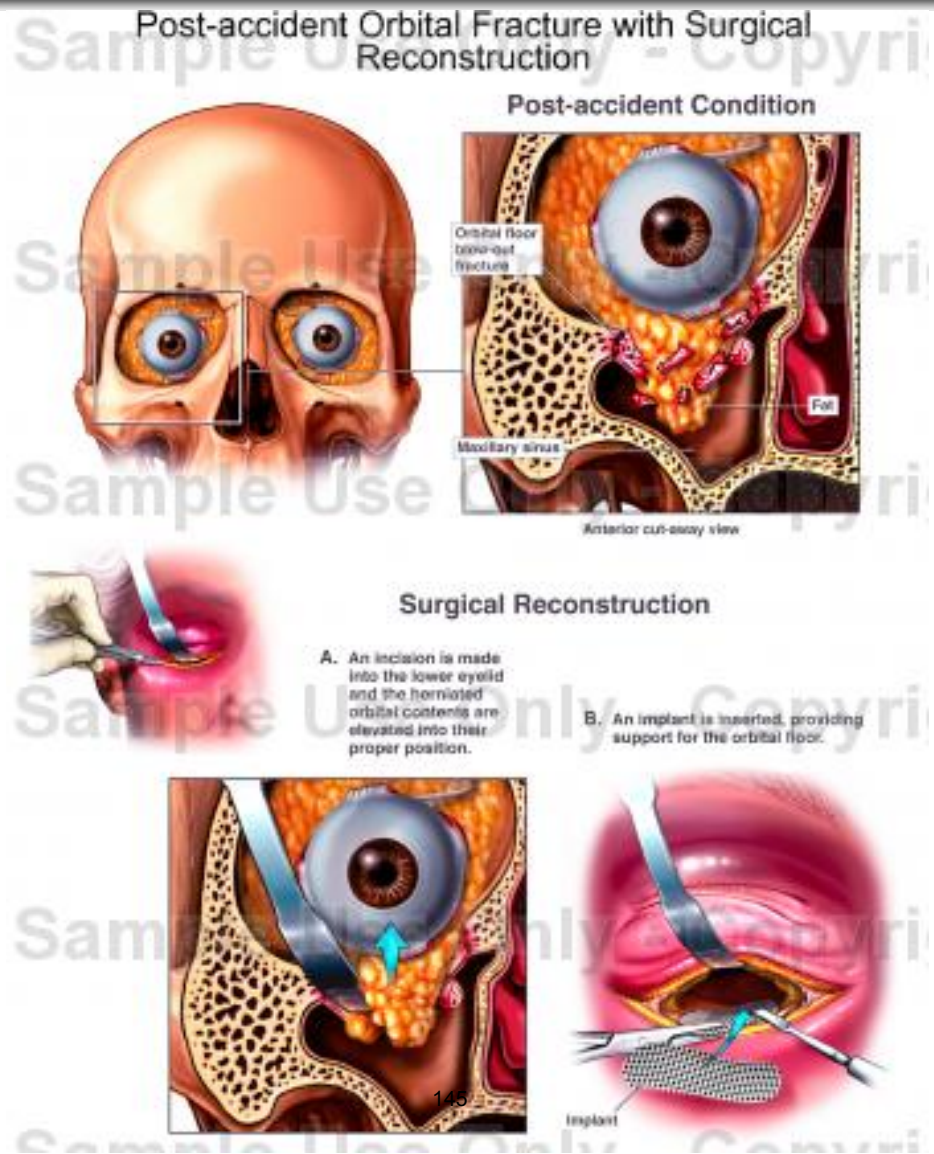
Aquilion AF
cORB CT
PR/HF/VFH
/FC10/U03/P
UNIV OF IOWA ETC-CT


R
L



ORBITAL FLOOR FRACTURE



Critical Lens Materials: Polycarbonate or Trivex

- **Polycarbonate 2.0**
  - 21 x stronger than CR 39 (standard ophthalmic plastic lens material) on impact with a 1/8” missile
  - 100 x stronger than CR 39 on impact with a 1” missile
  - Compulsory ballistic testing for Polycarbonate 2.0 includes impact with a ¼” missile fired at 150 feet/second
- Photochromic lenses in Polycarbonate or Trivex are an excellent choice for indoor/outdoor sports

Risks to the One-Eyed Athlete

- Eye injuries are the leading cause of monocular blindness
- The one-eyed athlete is 150 times more likely to go completely blind than an athlete with two fully functioning eyes
- Protective eyewear should be mandated for all one-eyed athletes participating in risk-prone sports

CURRICULUM VITAE

NAME: Howard B. Cohen
MARITAL STATUS: Married
DOB: 7/16/39
CHILDREN: 5

HIGH SCHOOL:	Stuyvesant High School, New York City, N.Y. Diploma - Academic	1954-1961
COLLEGE:	New York University, Heights, N.Y. Degree: B.A.	1957-1961
MEDICAL SCHOOL:	New York Medical College Degree: M.D.	1961-1965
INTERSHIP:	Jersey Shore Medical Center Type: Rotating	1965-1966
ASSIGNMENTS:	General Medical Officer, 7th Special Forces Group, Fort Bragg, North Carolina	1966-1967
	General Medical and Surgical Officer, 5th Special Forces Group, Vietnam	1967-1968
	Chief, EENT, Fort Carson, Colorado	Mar 1972 - Sep 1974
	Staff Ophthalmologist, Fitzsimons Army Medical Center, Denver, Colorado	Sep 1974 - Jul 1975
	Asst Chief, Ophthalmology Service, Letterman Army Medical Center, Presidio of San Francisco, California	Feb 1977 - Feb 1983
	Director, Vitreo-Retinal Service	Feb 1977 - Present
	Chief, Ophthalmology Service, Letterman Army Medical Center, Presidio of San Francisco, California	Feb 1983 - [redacted] 1987
RESIDENCY:	Ophthalmology - Fitzsimons Army Medical Center, Denver, Colorado	Mar 1969 - Mar 1972
FELLOWSHIPS:	Vitreo-Retinal Surgery - Dr. Charles Schepen Retina Associates, Fellow Retina Service, Massachusetts Eye and Ear Infirmary and Harvard Medical School	Aug 1975 - Feb 1977