

بِه نام

خدا

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Prof of Ophthalmology

Clinical Diagnosis and Management of Ocular Trauma

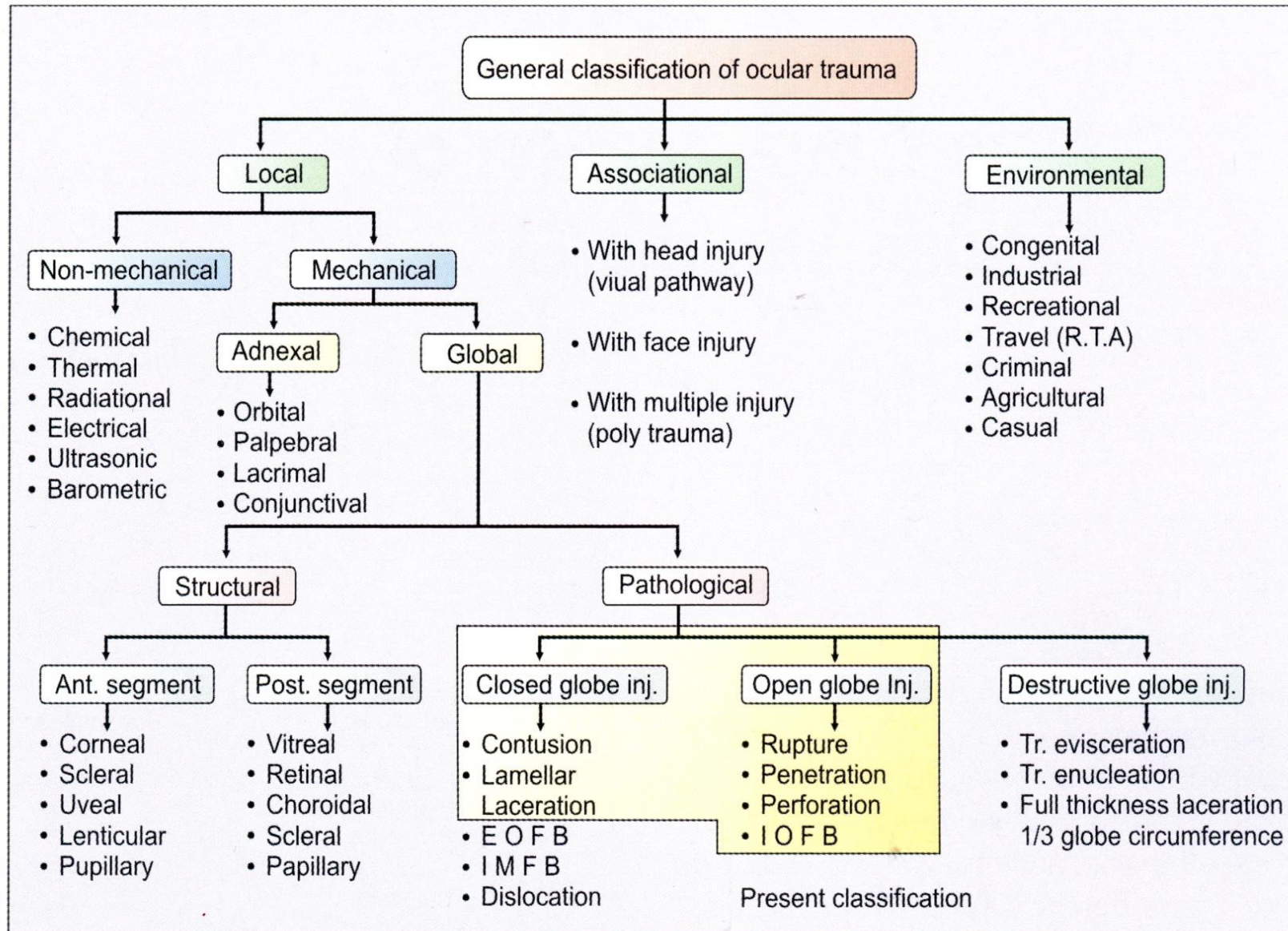


Fig. 2.2: General classification of ocular trauma

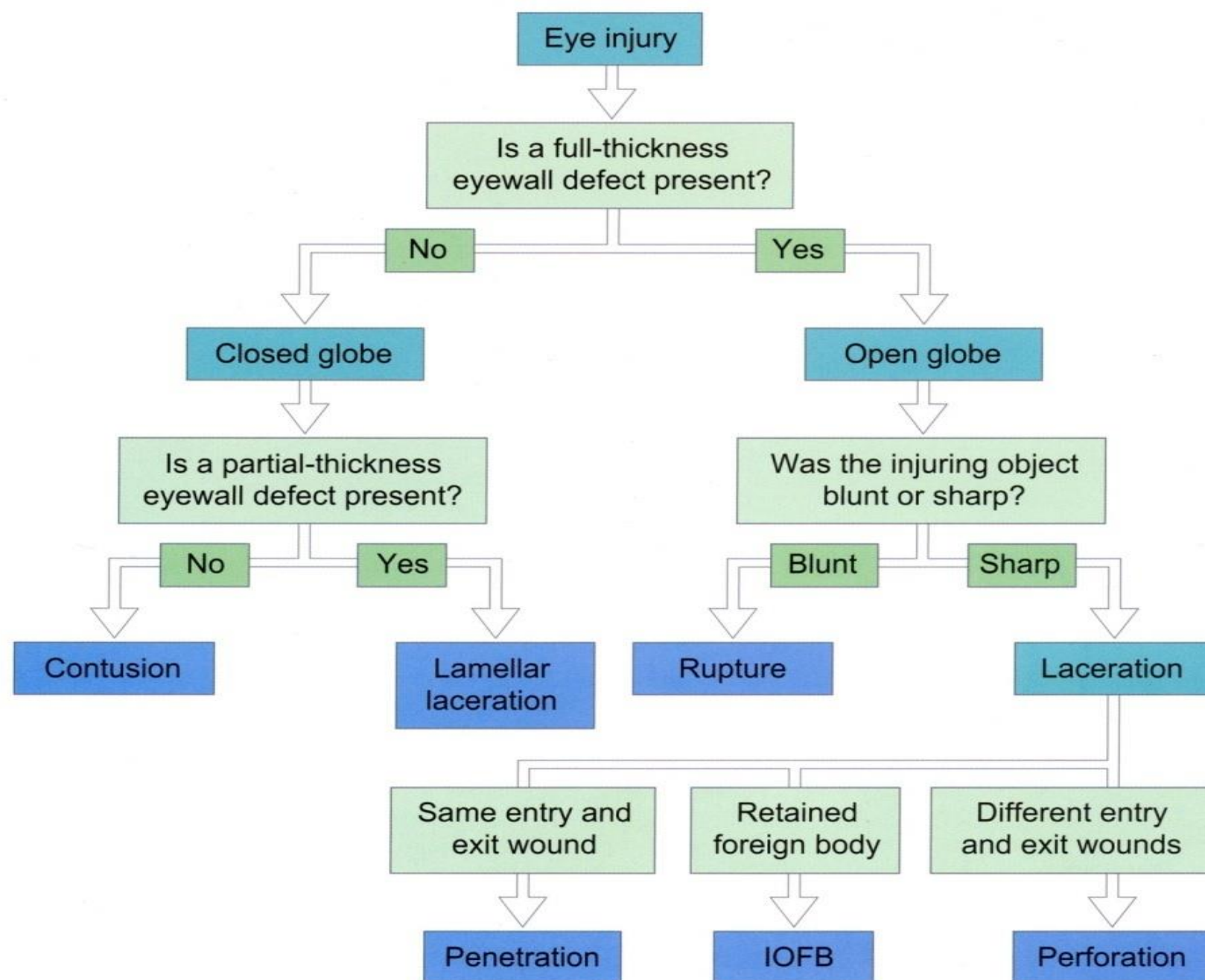


Figure 4.4 Flow diagram for making appropriate ocular trauma diagnosis. (After Kuhn F, Morris R, Witherspoon CD. Birmingham Eye Trauma Terminology (BETT): terminology and classification of mechanical eye injuries. *Ophthalmol Clin N Am* 2002;15:139–143, with permission of Elsevier.)

Table 1.1.3 (continued) Terms and definitions in BETT

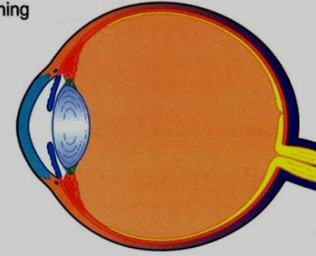
Term	Definition	Comment
Laceration	Full-thickness wound of the eye wall, caused by a sharp object	The wound is at the impact site and is created by an outside-in mechanism; since IOP elevation is unavoidable, tissue prolapse is common
Penetrating injury	An entrance wound is present	If more than one wound is present, each must have been caused by a different object
IOFB	One or more foreign objects are present	Technically a penetrating injury, but grouped separately because of different clinical implications (management, prognosis)
Perforating injury	Both an entrance and an exit wound are present	The two wounds caused by the same agent

Cornea

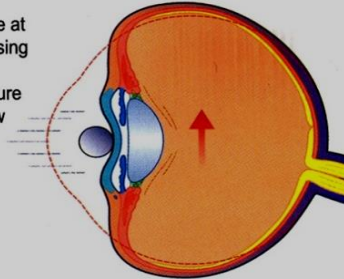


Optic Nerve

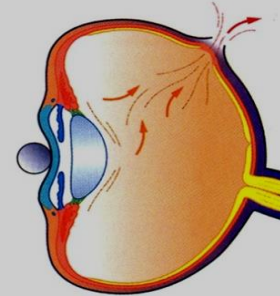
Blunt object approaching eye at high speed



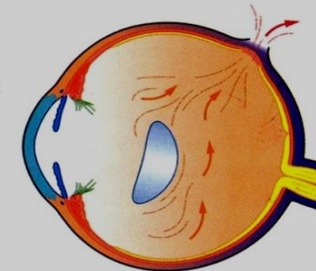
Object strikes eye at high velocity causing a sudden rise in intraocular pressure depicted by arrow



When the intraocular pressure is high enough, a break in the eyewall occurs leading to extrusion of intraocular contents



After the injury, severe intraocular disruption is present



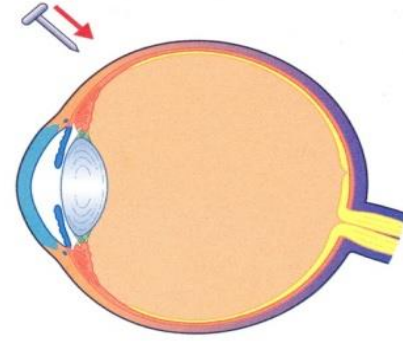
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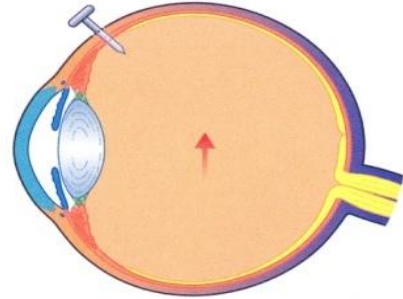
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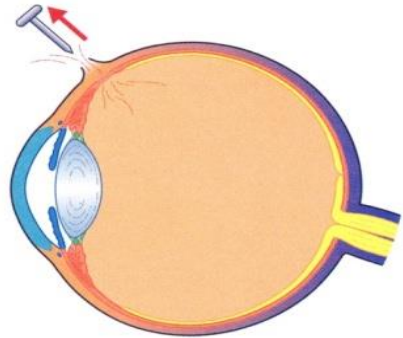
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Sharp object approaches the eye at a high velocity



Sharp object pierces the eye, causing only a mild rise in intraocular pressure



Sharp object is removed from the eye and only minimal intraocular disruption is seen at the wound

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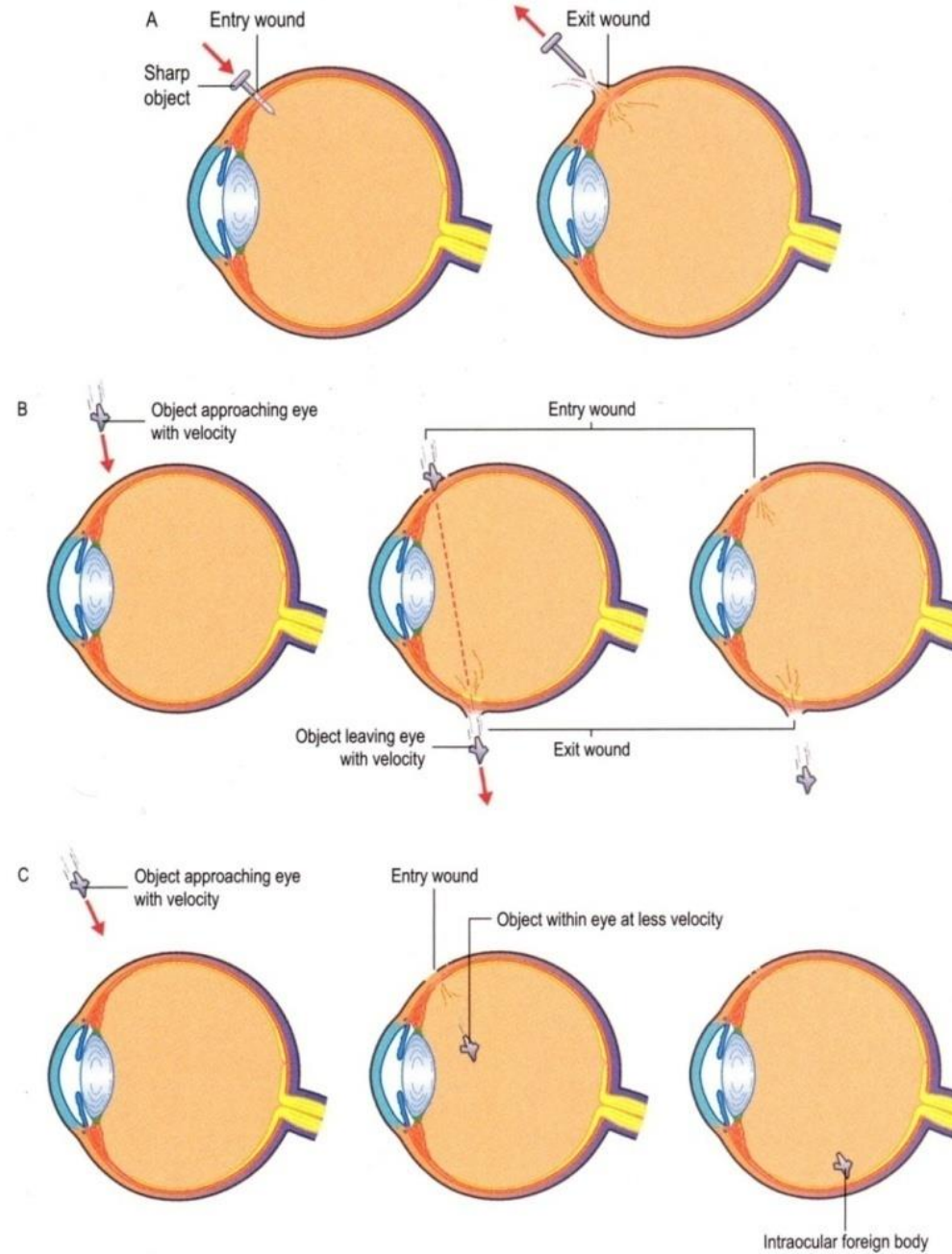


Figure 4.3 Schematic illustration of the differences between an eyewall penetration (A), eyewall perforation (B), and an intraocular foreign body (C).













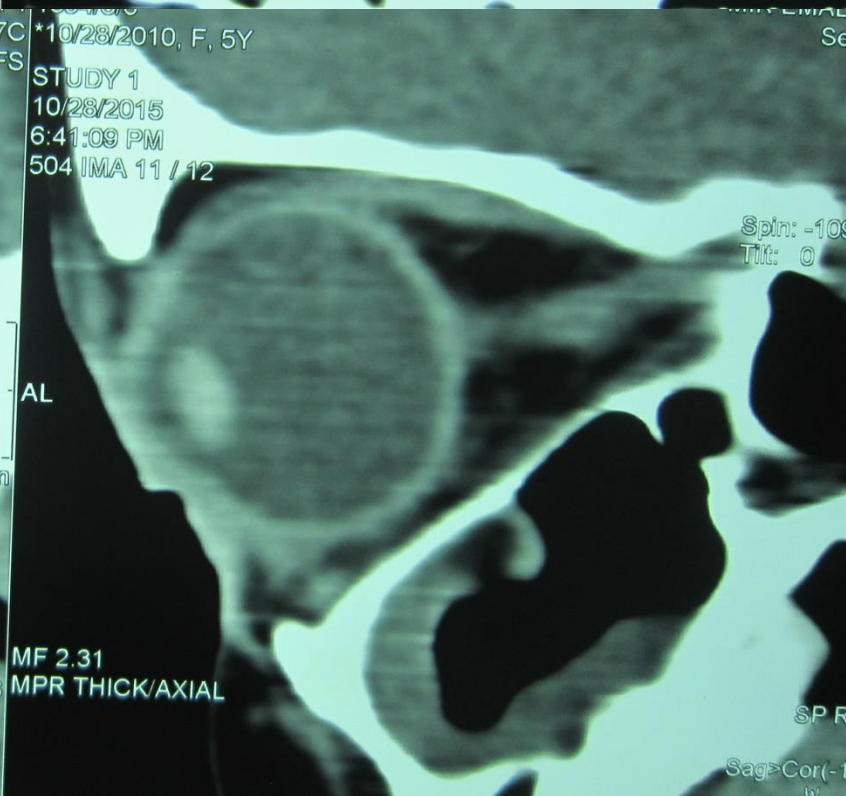
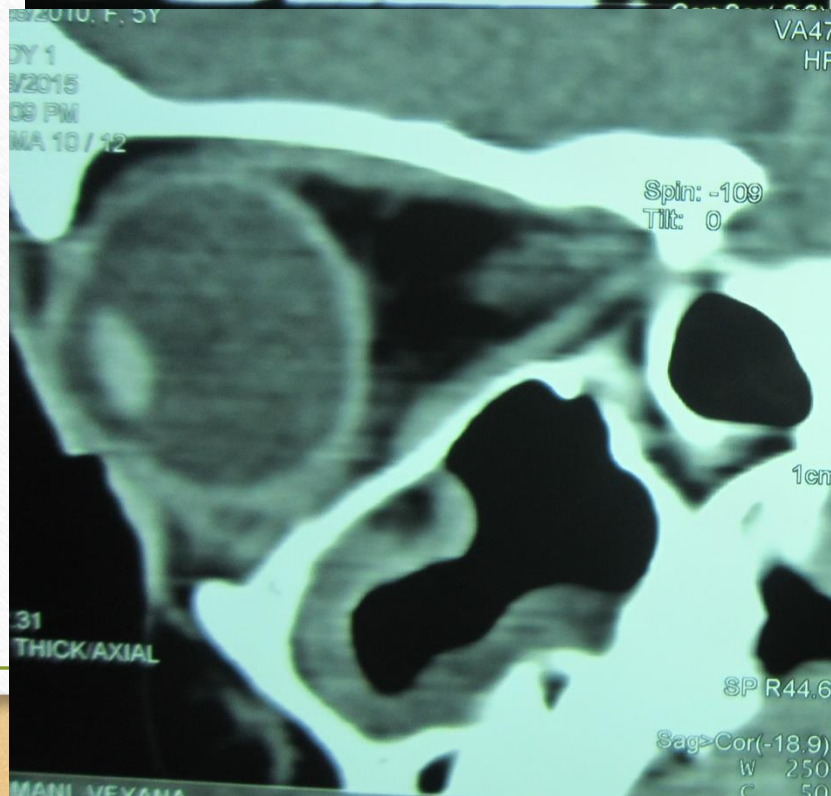
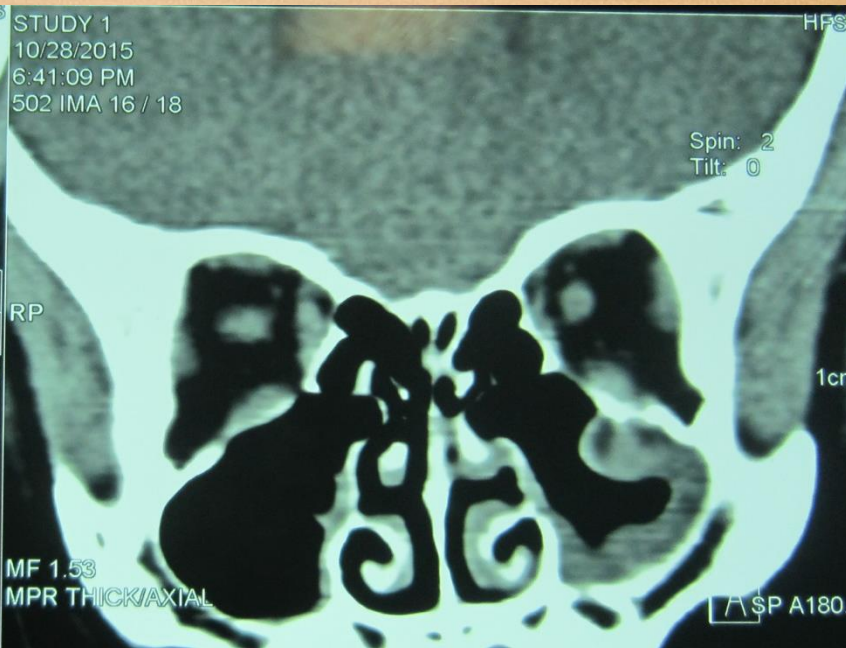
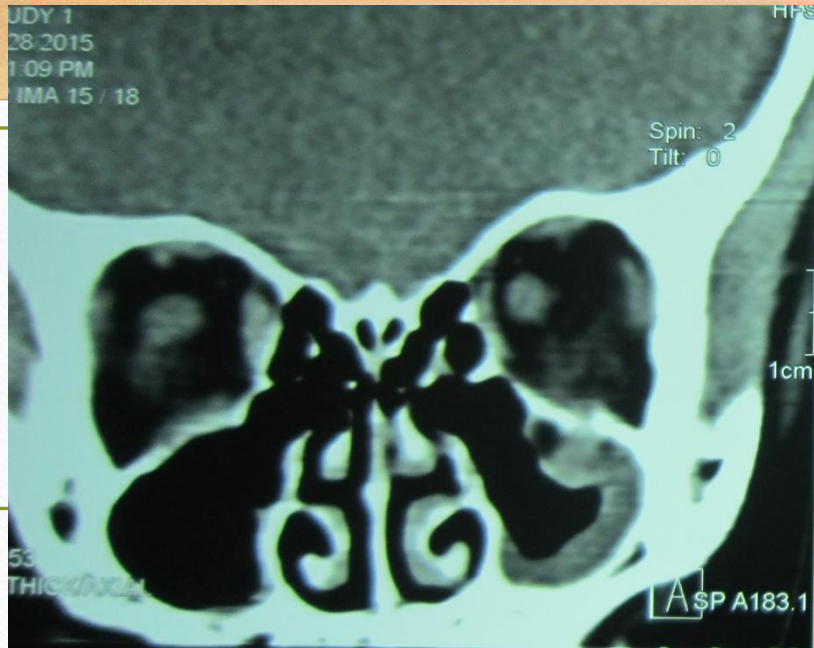


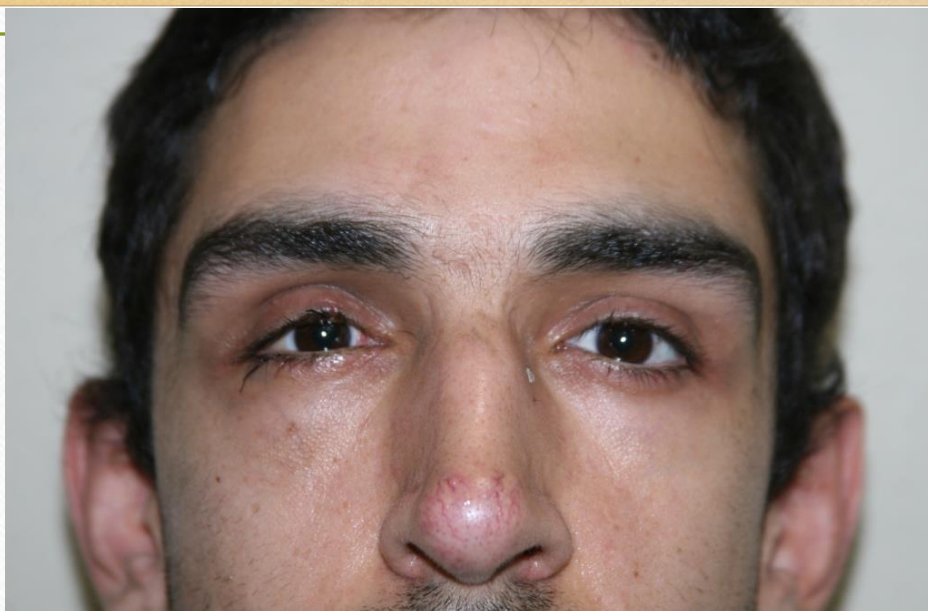










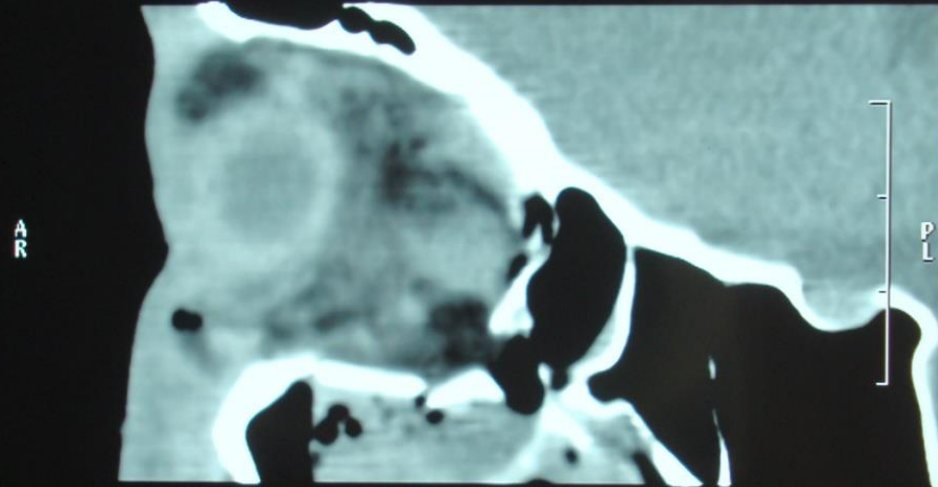


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Im: 19

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Apr 13 2014
512

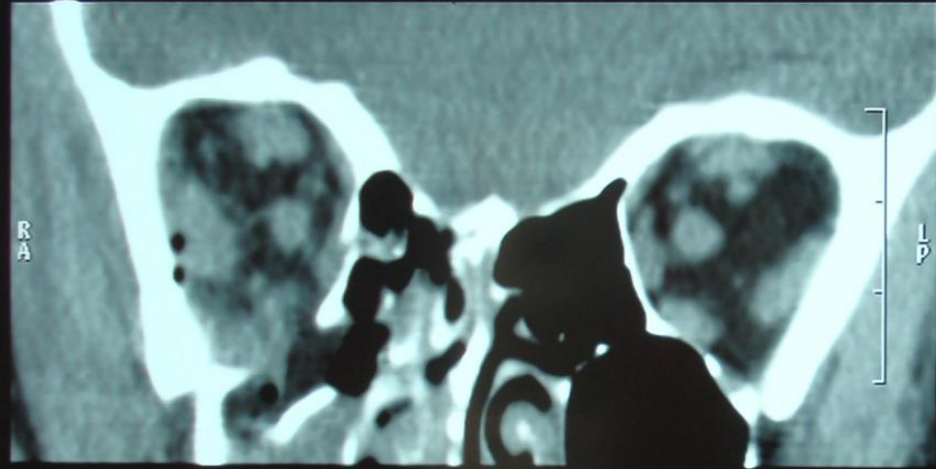


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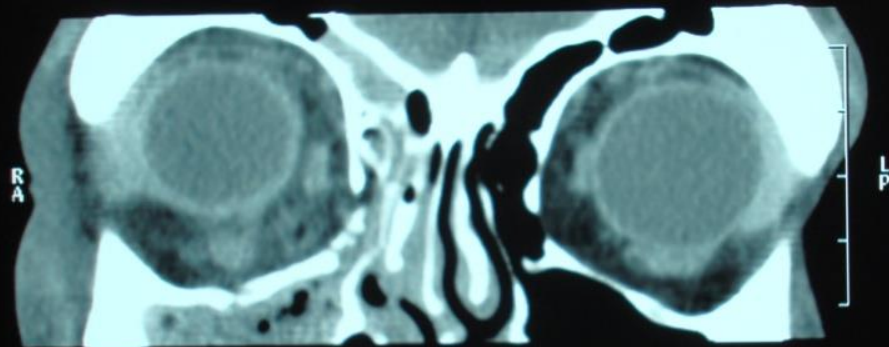


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GHAREMANI DONYA
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Apr 17 2012

512

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S 43

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FARABI HOSPITAL
GHAREMANI DONYA
F 10 672

Apr 17 2012

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FARABI HOSPITAL
GHAREMANI DONYA
F 10 672

Apr 17 2012

512

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S 43

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GHAREMANI DONYA
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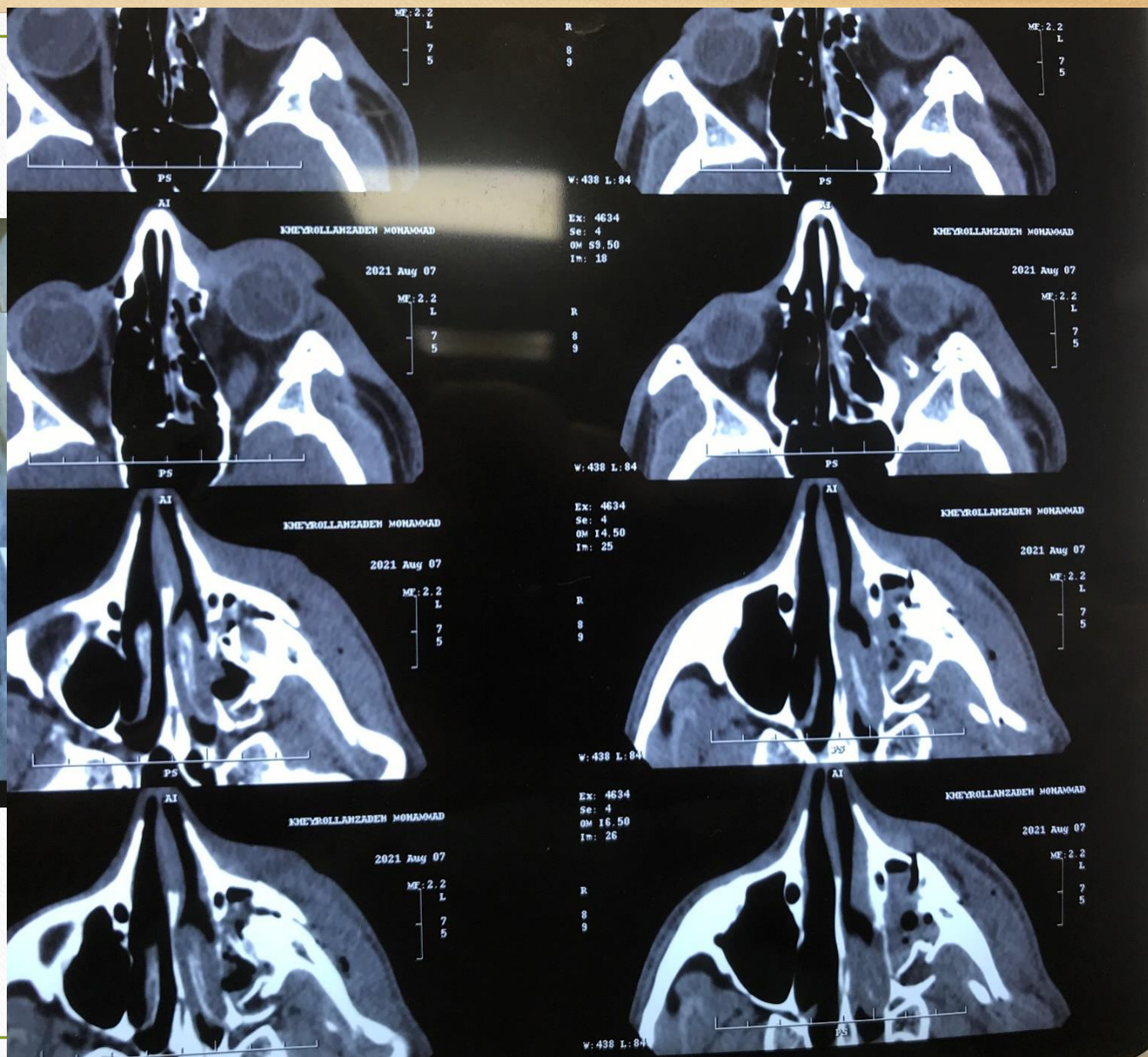
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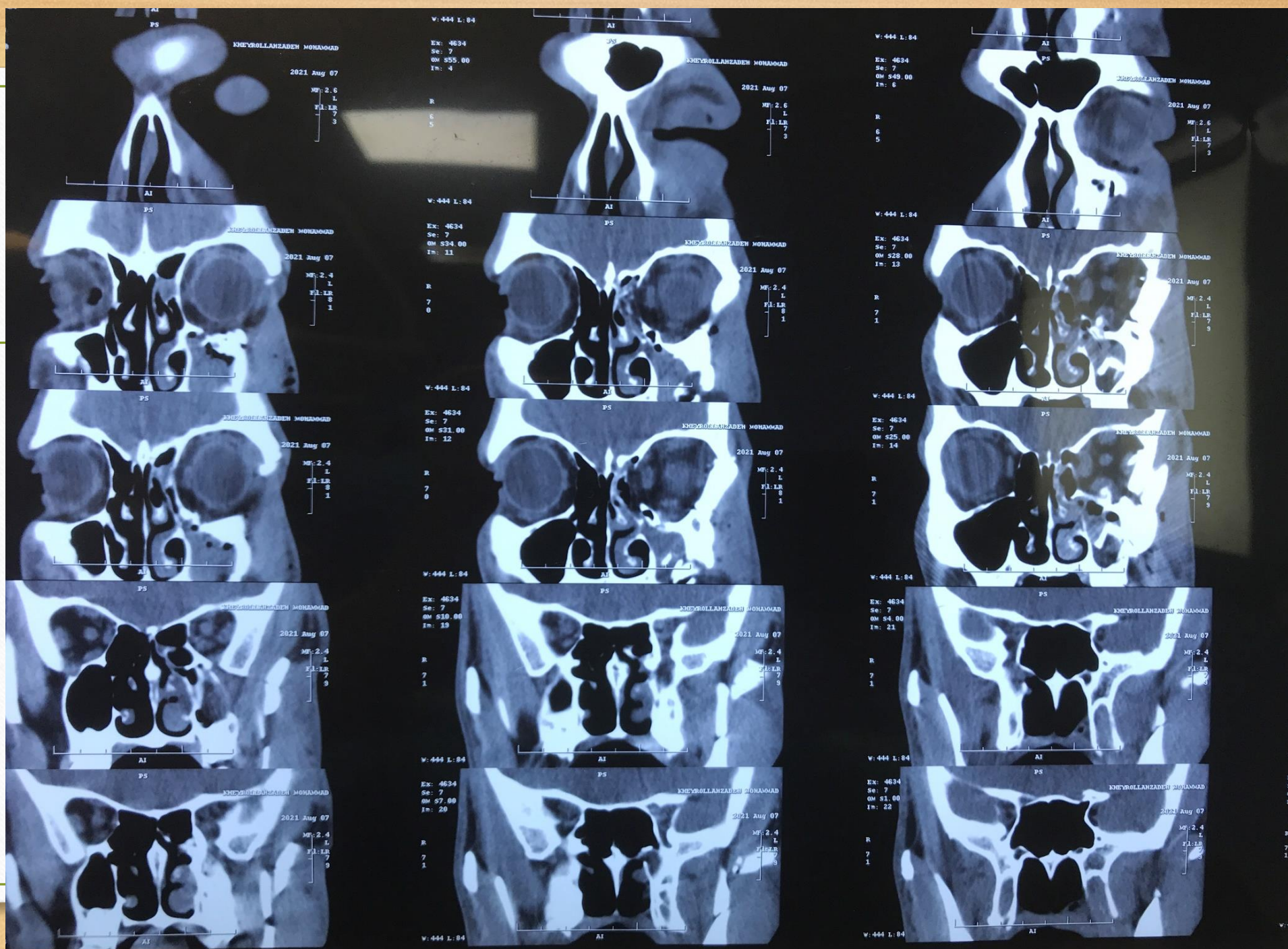
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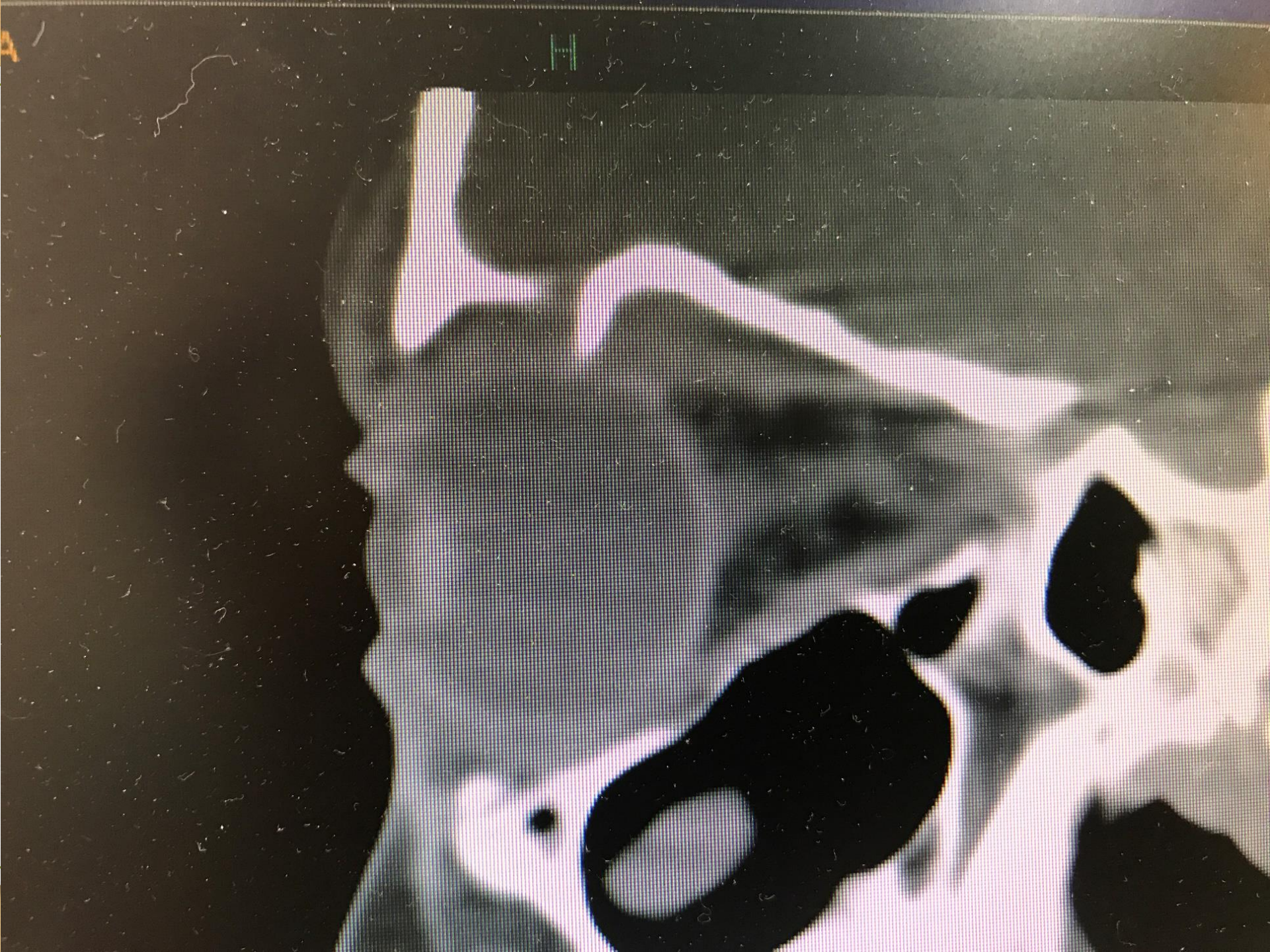














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DETL/I/

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FARABI HOSPITAL
MAHMOUDISOGHRA
F 38 6811

Dec 10 2013
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DETL/I/

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I 33

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FARABI HOSPITAL
MAHMOUDISOGHRA
F 38 6811

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FARABI HOSPITAL
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F 38 6811

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DETL/I/

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FARABI HOSPITAL
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DETL/I/

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I 33

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FARABI HOSPITAL
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F 38 6811

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FARABI HOSPITAL
MAHMOUDISOGHRA
F 38 6811

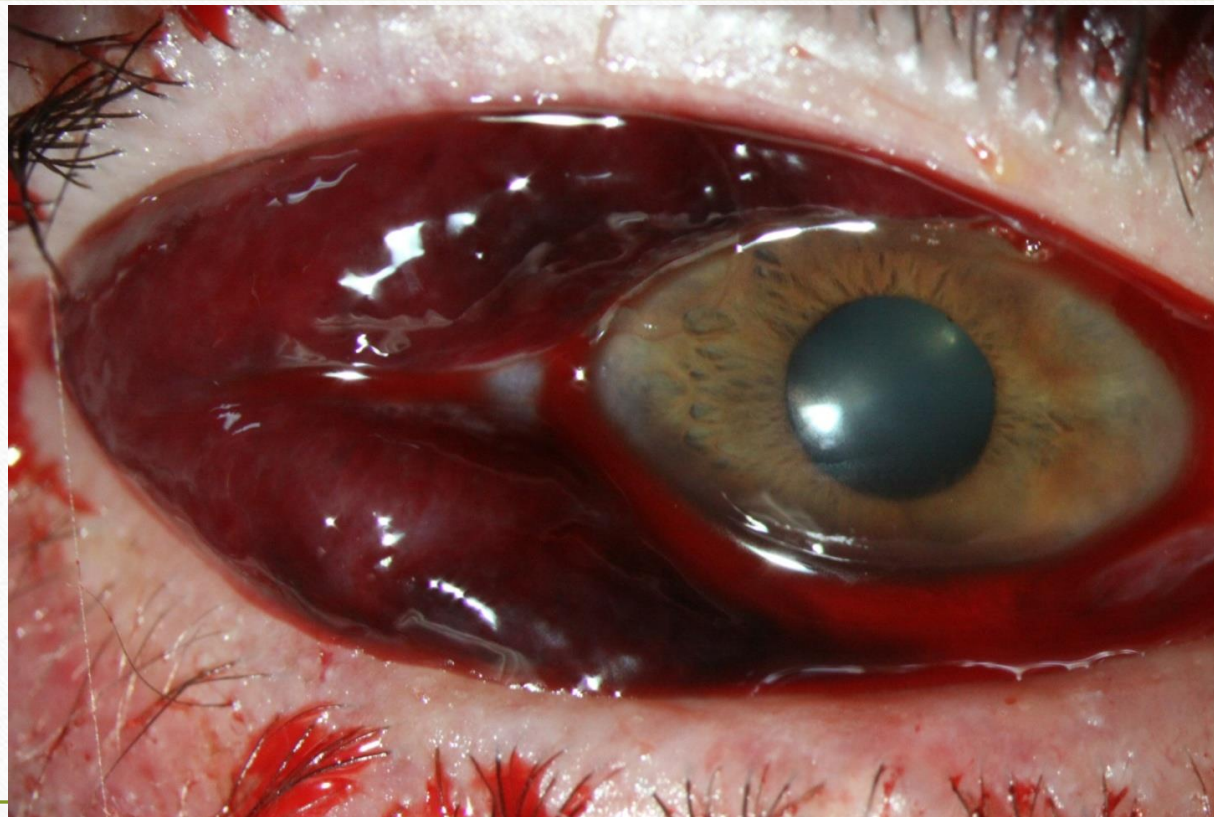
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I 33

Sub conjunctival hemorrhage

Exploration



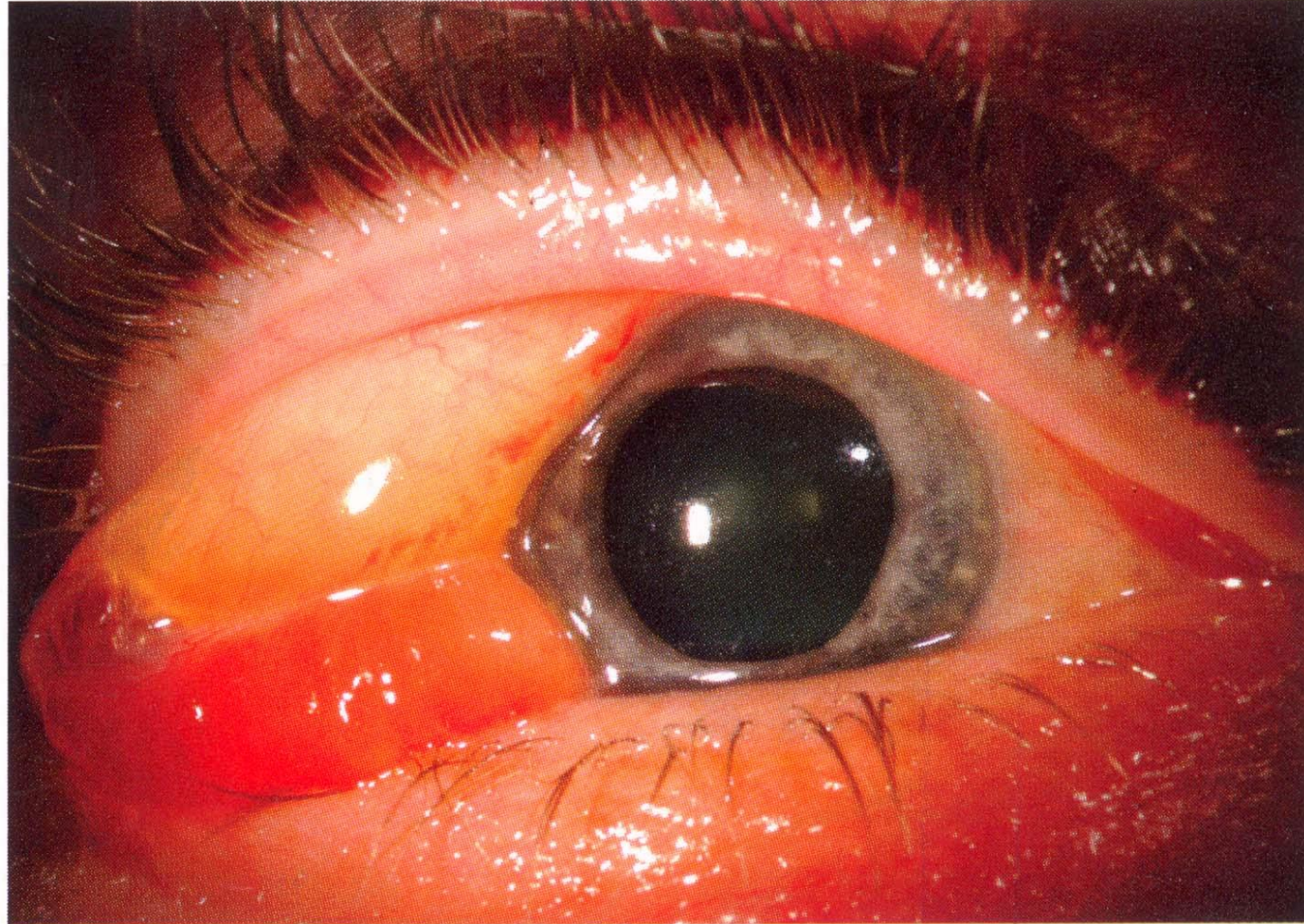


Figure 11.5 'Jelly-roll' chemosis is frequently associated with open globe injuries.

VA : NLP

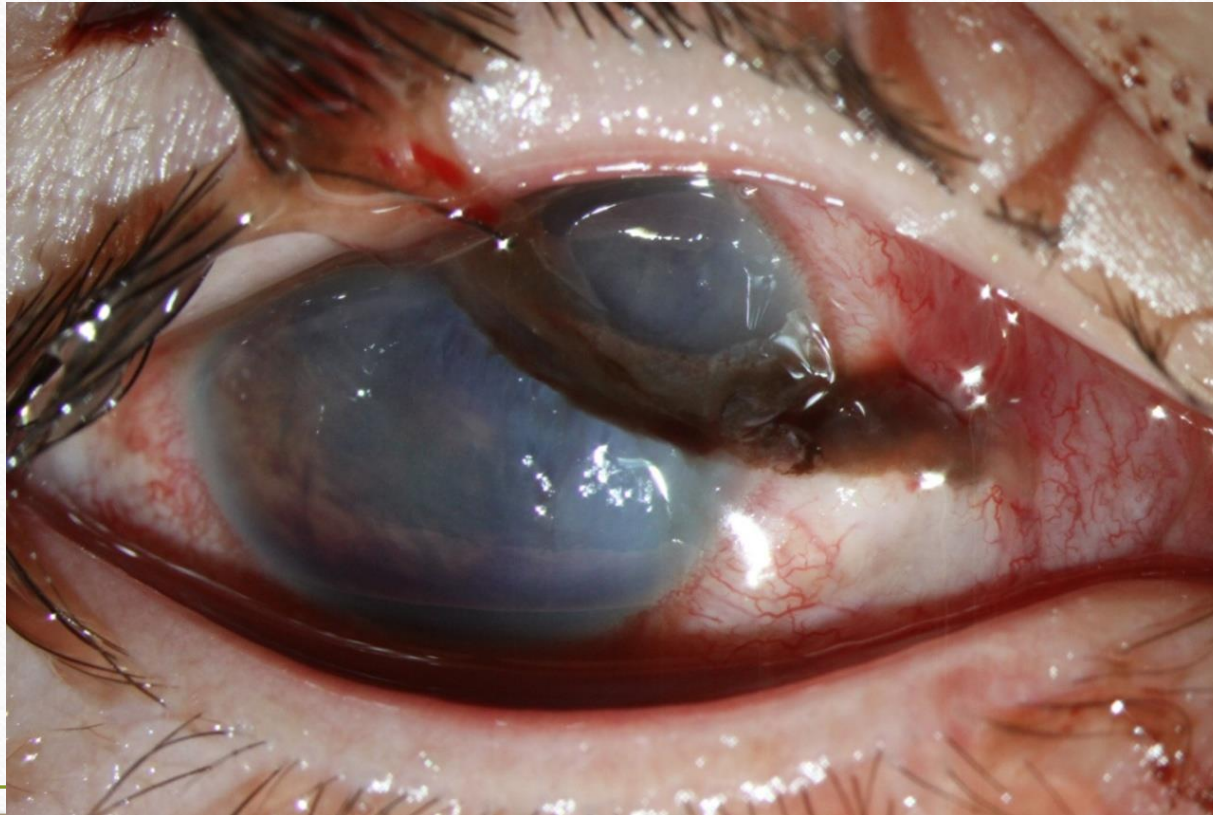
RAPD : 4+

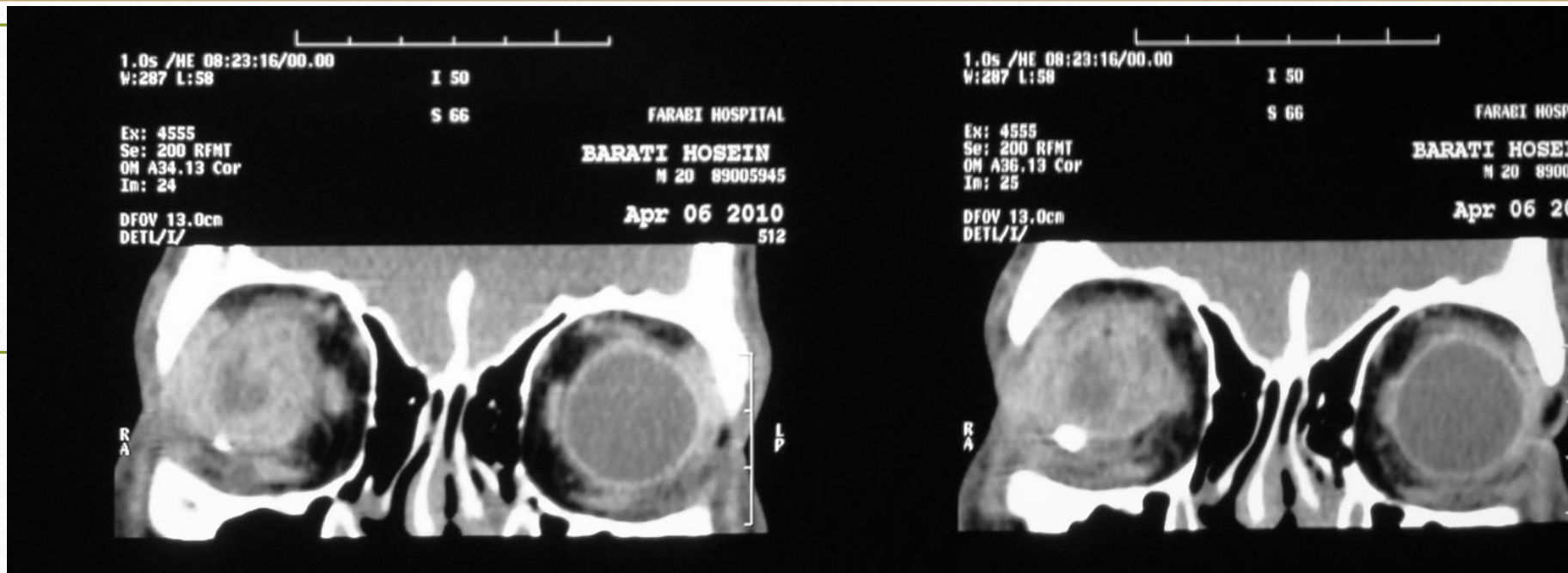
Assessment :

Corneoscleral laceration

Penetrating injury

Penetrating injury (corneoscleral laceration)





VA : NLP

RAPD : ƴ plus

IOFB : stone / metallic

Assessment :

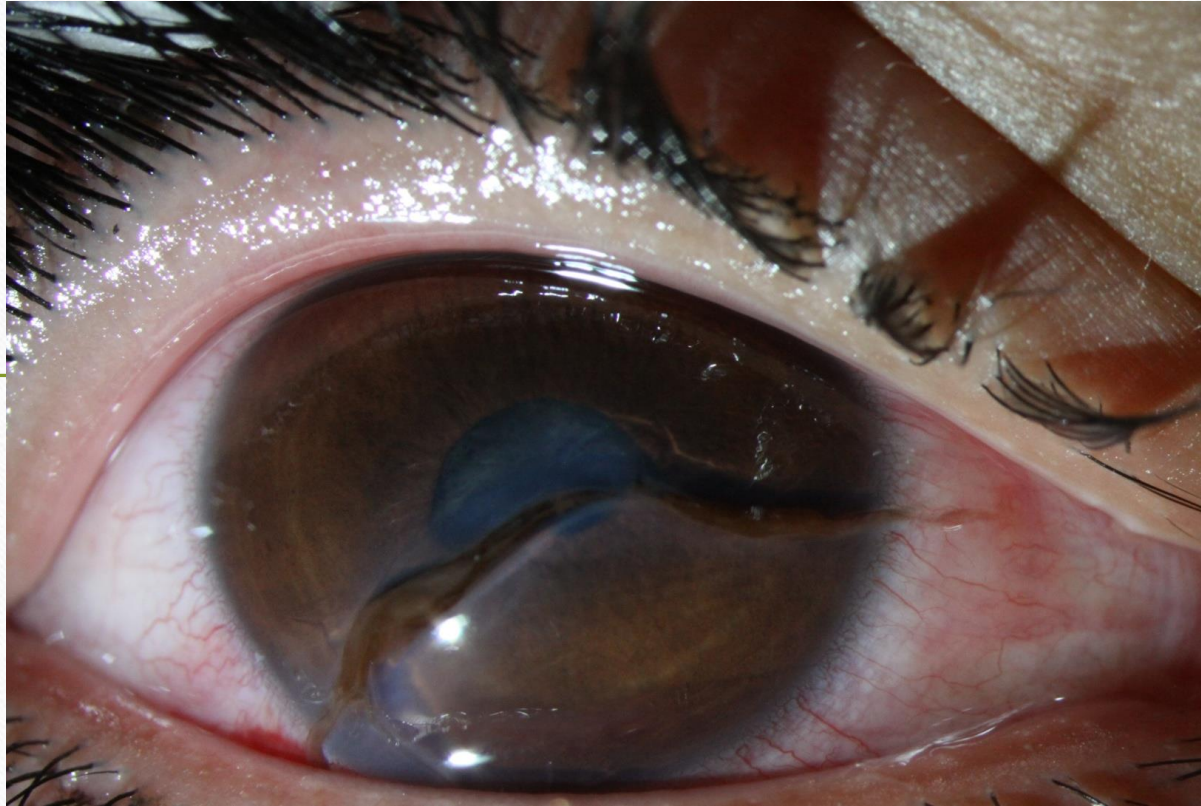
IOFB

IOFB (Metallic / stone)

IOFB – corneoscleral laceration (Rupture ?)

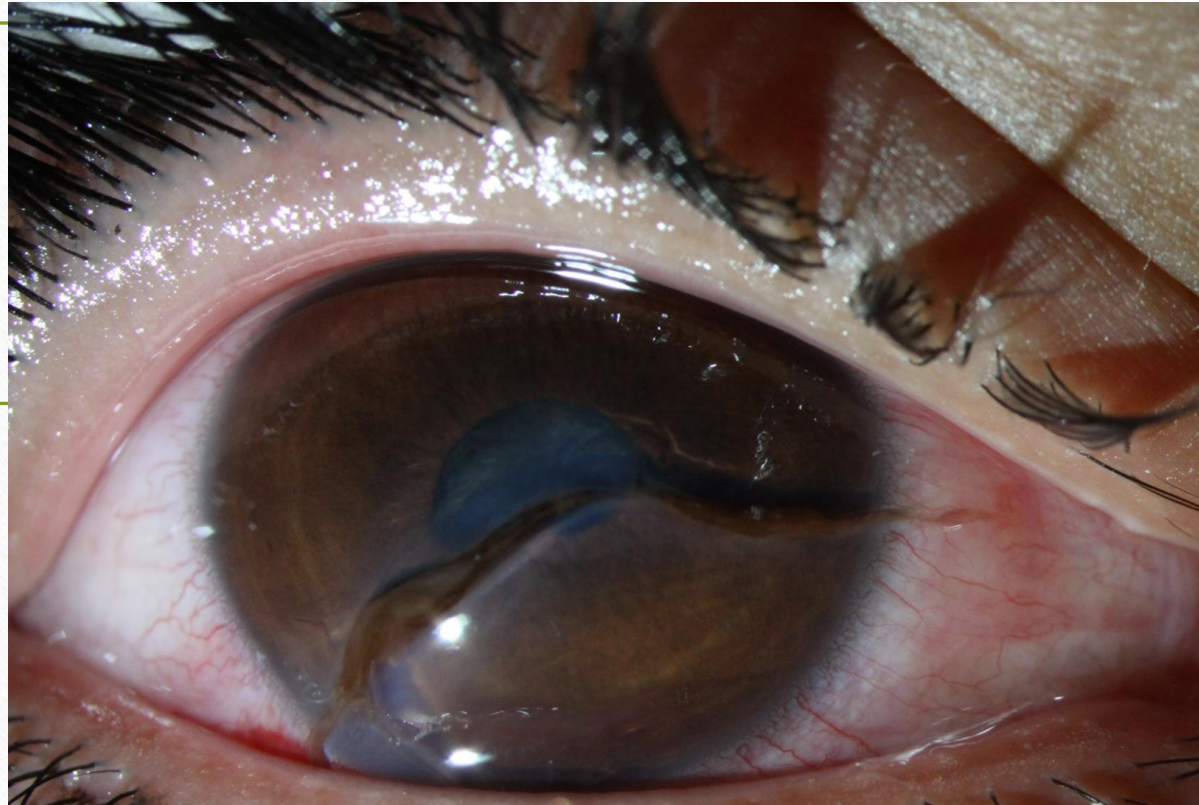


برخورد بشقاب به چشم راست
Assessment ?

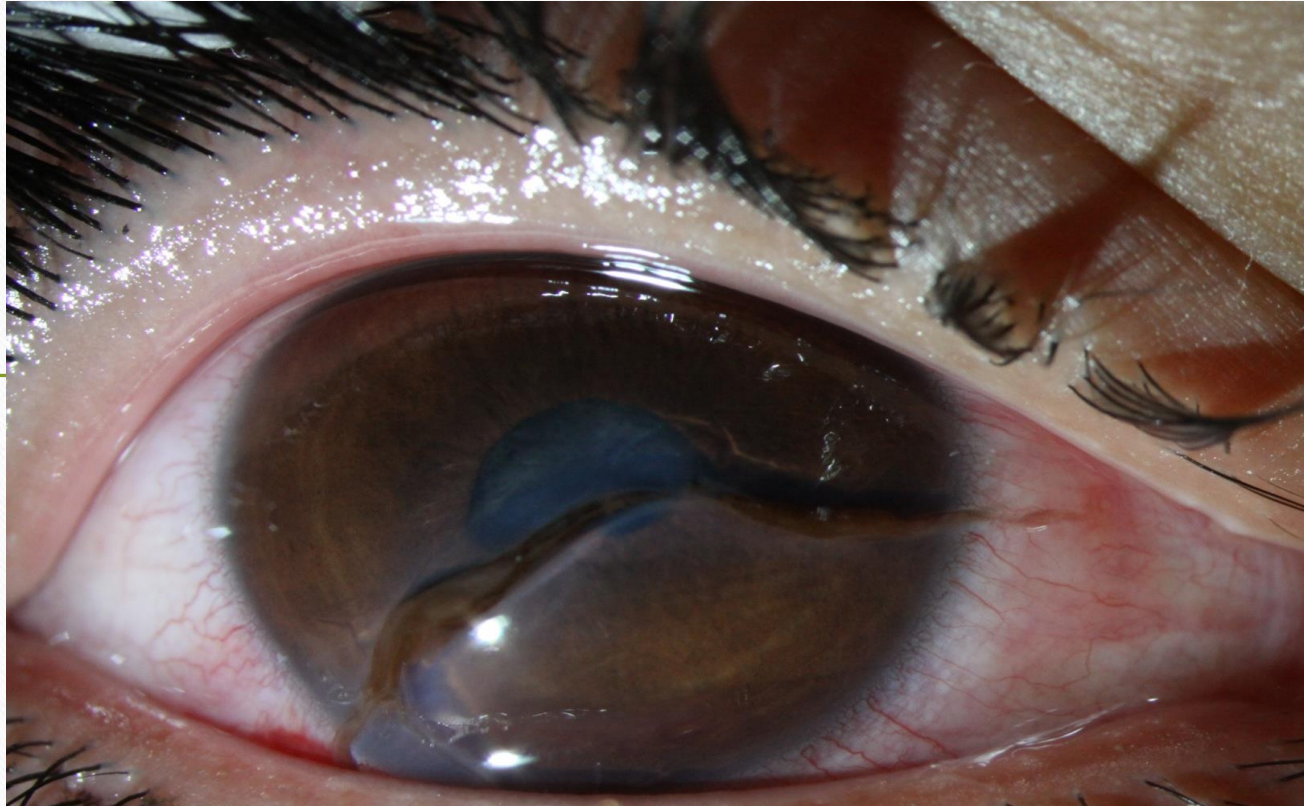


Eye drop ?

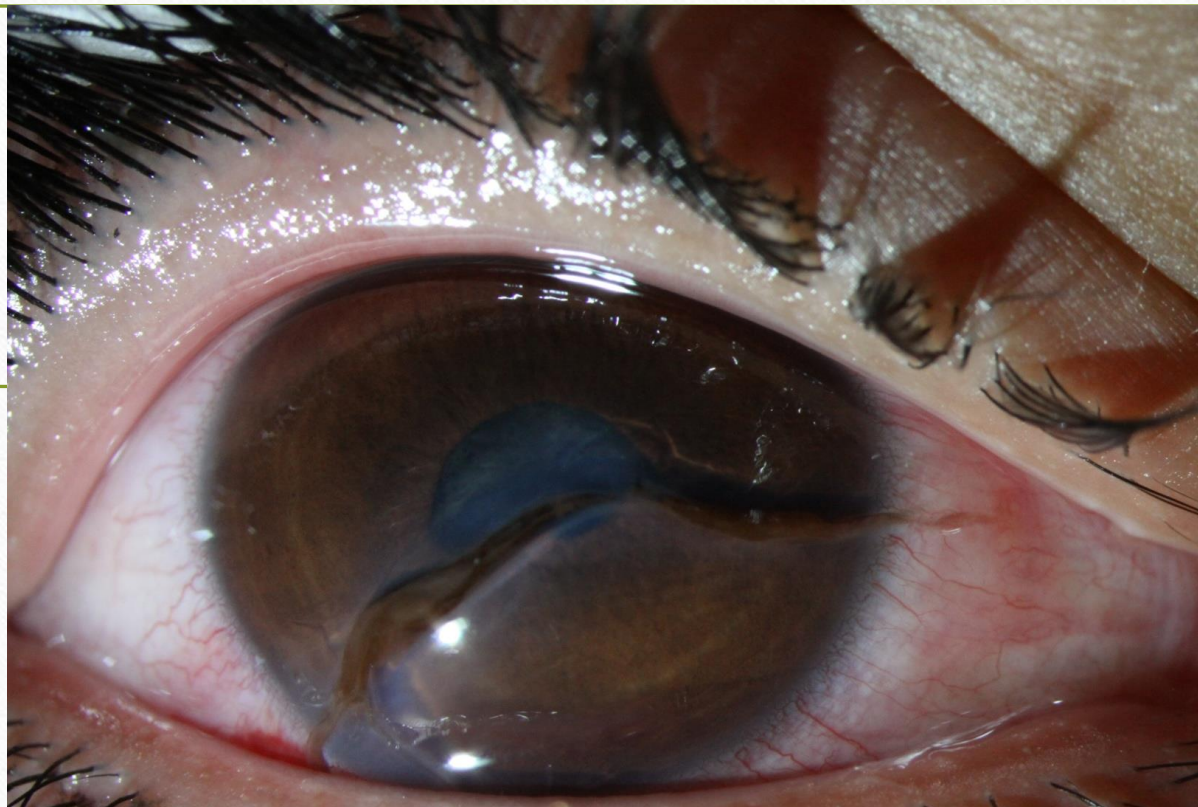
- ١) Betamethazone**
- ٢) Chloramphenicol**
- ٣) Homatropin**



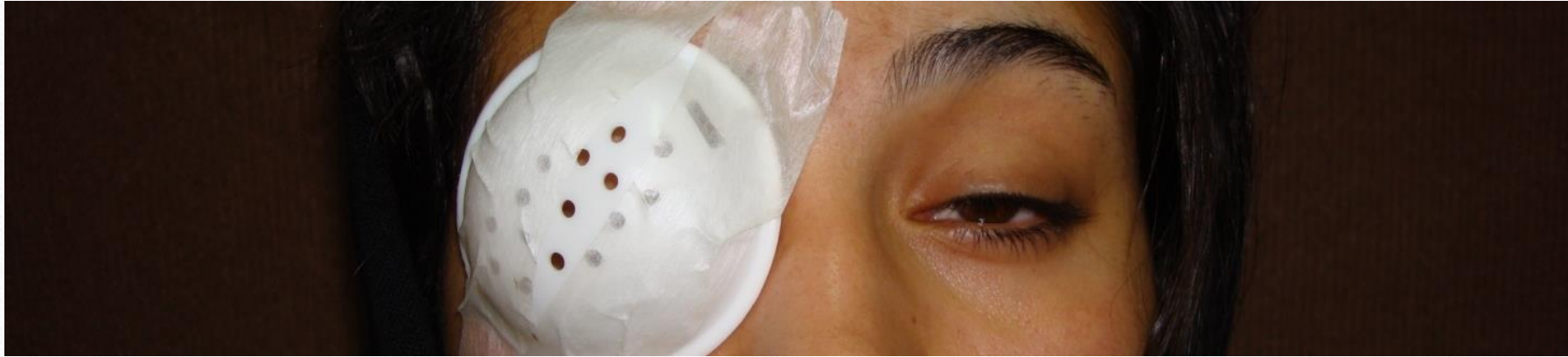
- ~~Eye drop ?
Betamethazone
Chloramphenicol
Homatropin~~



- ١) Patch
- ٢) Pressure patch
- ٣) Eye shield



~~Patch~~
~~Pressure patch~~
Eye shield





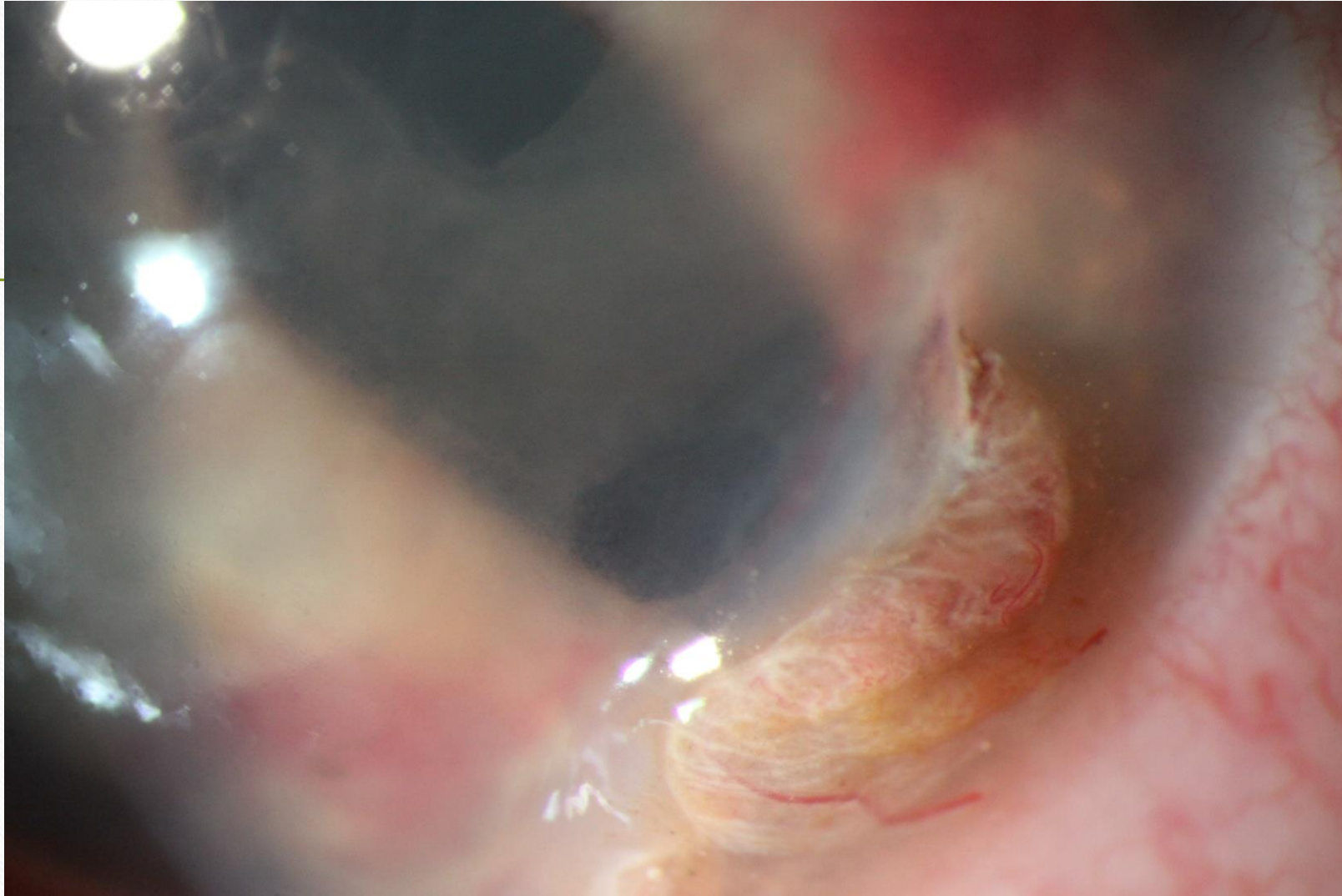
- ١) No imaging
- ٢) Plain X-ray
- ٣) CT Scan
- ٤) MRI



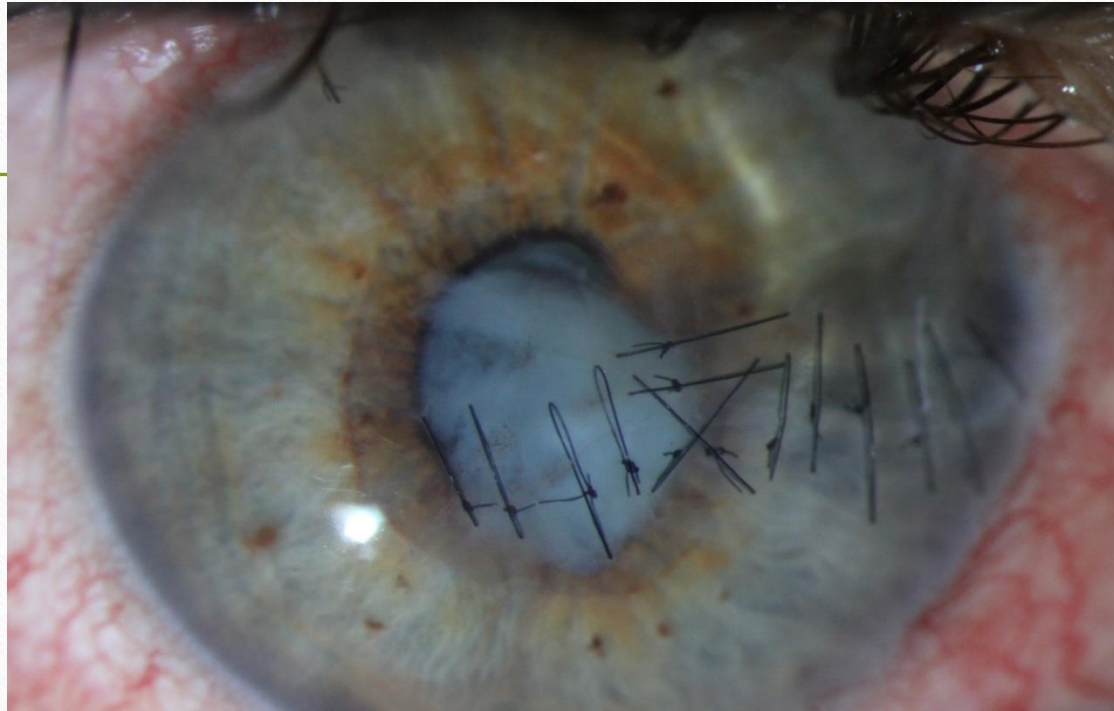
- **Primary repair & observation**
- **Primary repair , lens extraction & observation**
- **Primary repair , lens extraction , PCIOL**
- **Primary repair , lens extraction , vitrectomy , F.B removal , PCIOL ? , IV AB injection**



Farabi Eye Hospital OR 1-5
2010/09/07 18:17:25



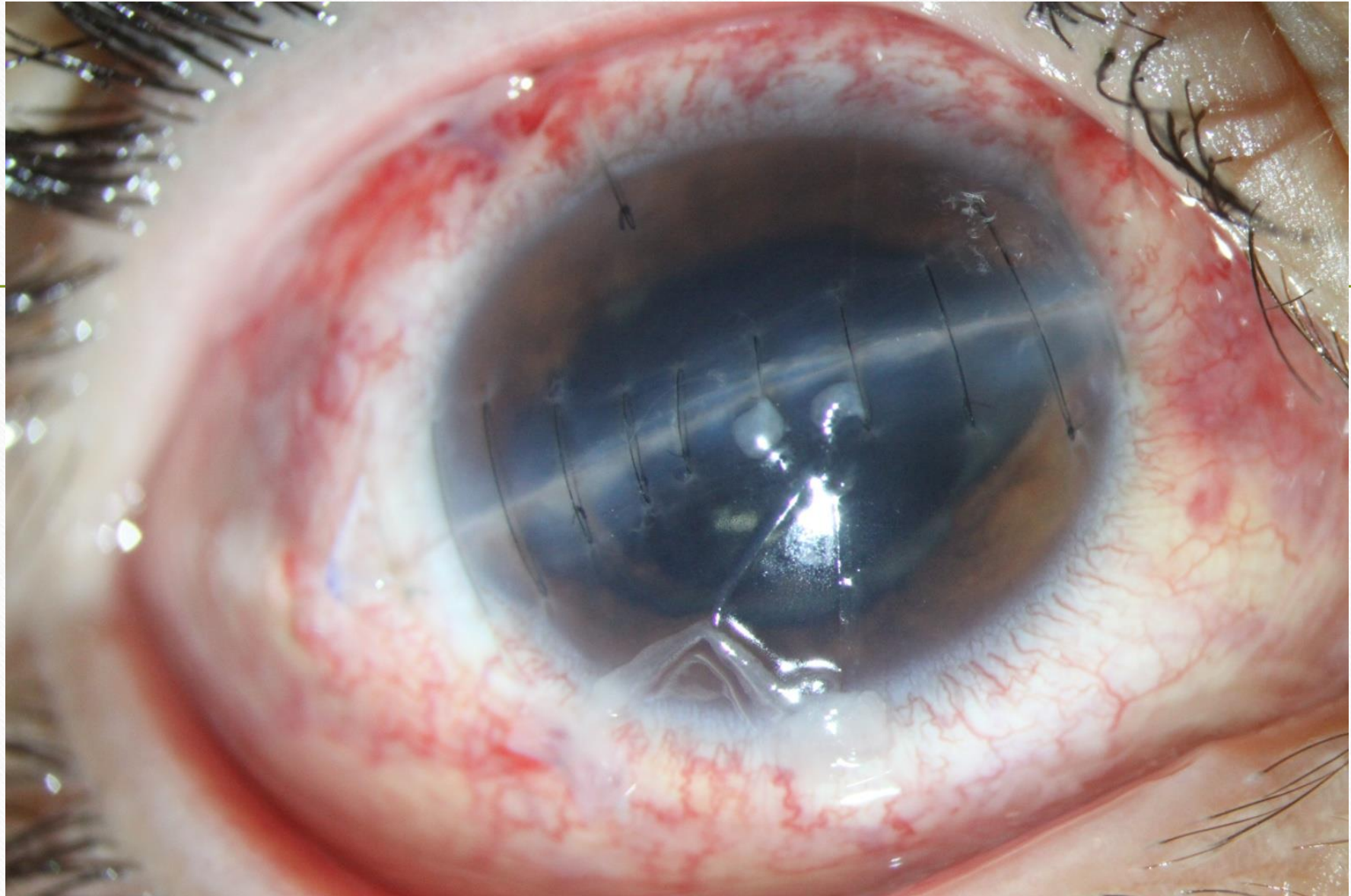
**Traumatic Cataract
iris laceration
irregular pupil**



Assessment :

**Repaired extensive , irregular corneal
laceration**

Traumatic cataract





Assessment :

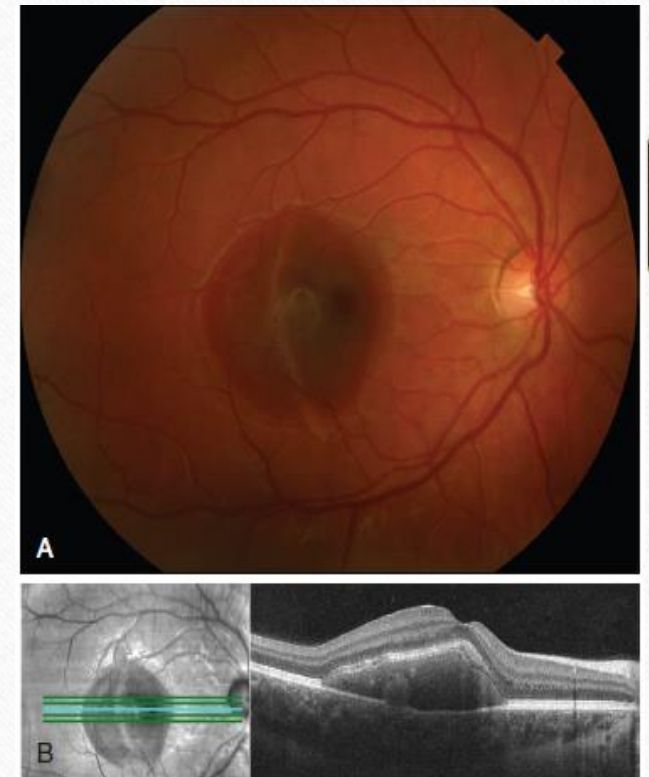
corneal laceration
penetrating injury
penetrating injury (corneal laceration)
penetrating injury (corneal laceration , IOFB)
IOFB (non metallic , corneal laceration)

Color fundus photograph reveals commotio retinae (*arrows*) and vitreous hemorrhage after blunt trauma.



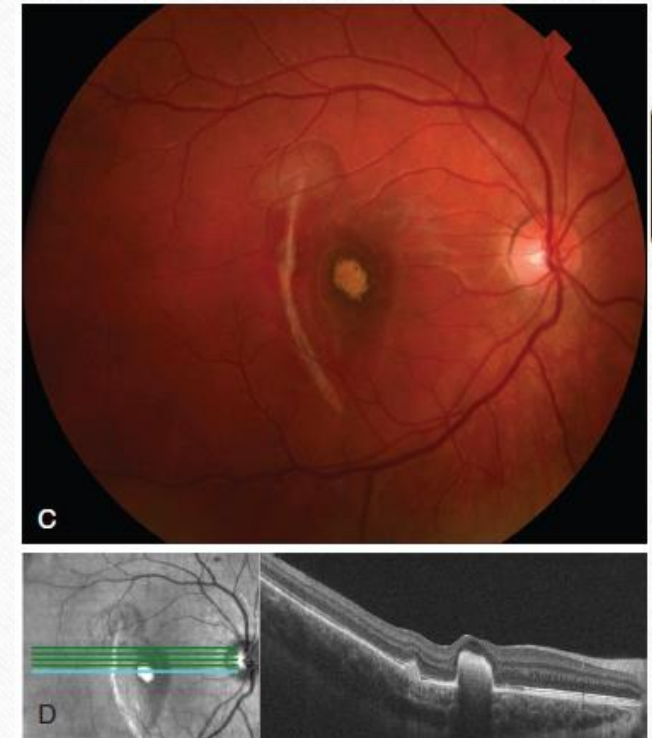
Posterior Segment Manifestations of Trauma

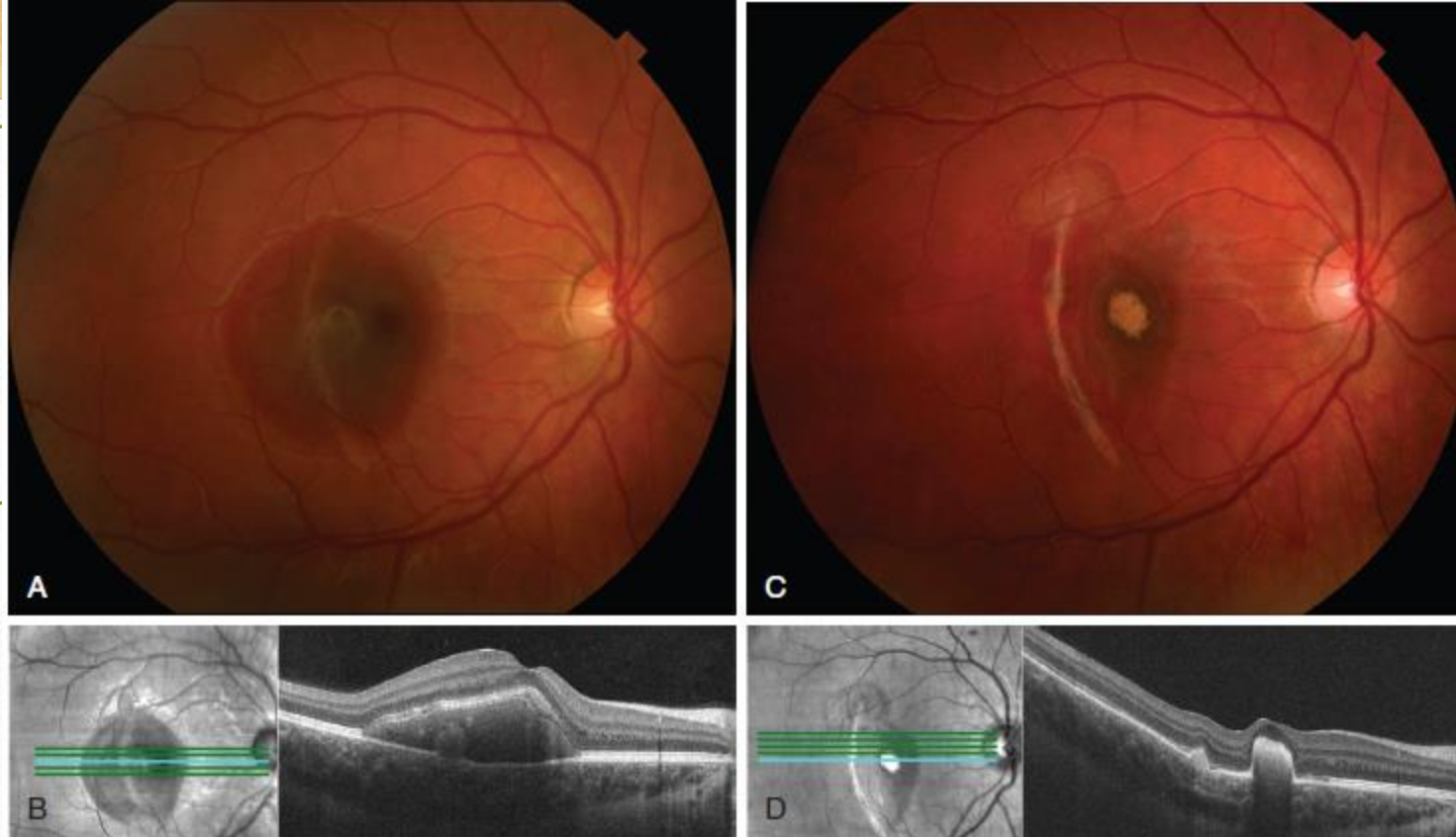
- **Choroidal Rupture:**
 - 1845
 - **Eye is compressed along its anterior-posterior axis tears may occur in the bruch membrane which has little elasticity**
 - **Subretinal hemorrhage**
 - **Single or multiple in the periphery and concentric to the optic disk**



Posterior Segment Manifestations of Trauma

- **Choroidal Rupture... :**
 - **Ruptures extend through the fovea may cause permanent visual loss, no effective treatment**
 - **CNV develops as a late complication after damage to the bruch membrane**
 - **Alerted for CNV**
 - **Anti VEGF for treatment**





- (A) Choroidal rupture in the macula with associated subretinal hemorrhage in an 11-year-old boy who sustained blunt trauma to his right eye with a baseball cap. Visual acuity is 20/100. (B) Optical coherence tomography (OCT) scan showing the area of the choroidal rupture as a discontinuity in Bruch's membrane. There is subretinal hyperreflective material consistent with the subretinal hemorrhage. (C) Five weeks later most of the blood has resolved except there is a small amount of dehemoglobinized subretinal blood at the fovea. There is also subretinal fluid at the superior edge of the choroidal rupture consistent with the development of a choroidal neovascular membrane. Visual acuity is 20/100. (D) OCT scan showing subretinal hyperreflective material in the area of the choroidal rupture and subfoveal hyperreflective material in the area of the dehemoglobinized hemorrhage. *(Courtesy of Shizuo Mukai, Massachusetts Eye and Ear.)*

Color fundus photograph from a patient with a posttraumatic submacular hemorrhage. The hemorrhage started to clear, revealing a choroidal rupture (*arrow*).

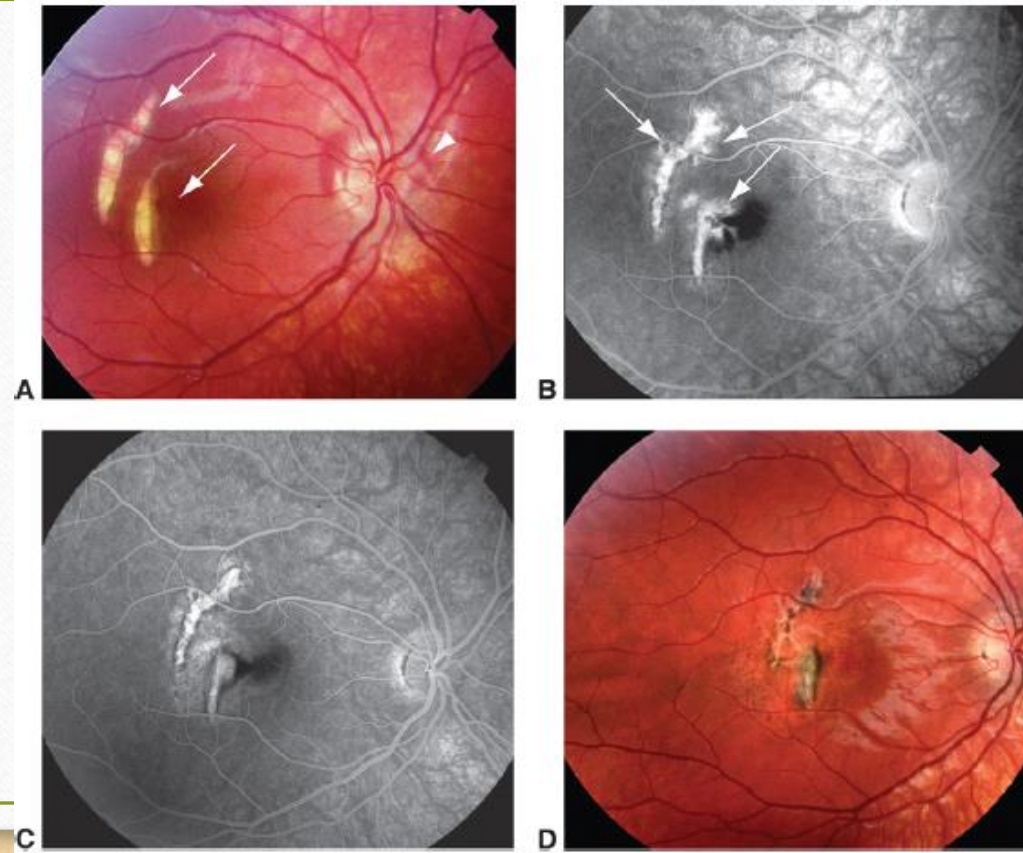
The yellow material located at the inferonasal portion of the macula (*arrowhead*) is dehemoglobinized blood. (*Courtesy of Mark Johnson, MD.*)



Images from a 10-year-old who was hit in the eye with a tennis ball. **A**, Color fundus photograph reveals choroidal ruptures (*arrows*). A subretinal hemorrhage is present around the nerve head (*arrowhead*). Visual acuity was 20/30.

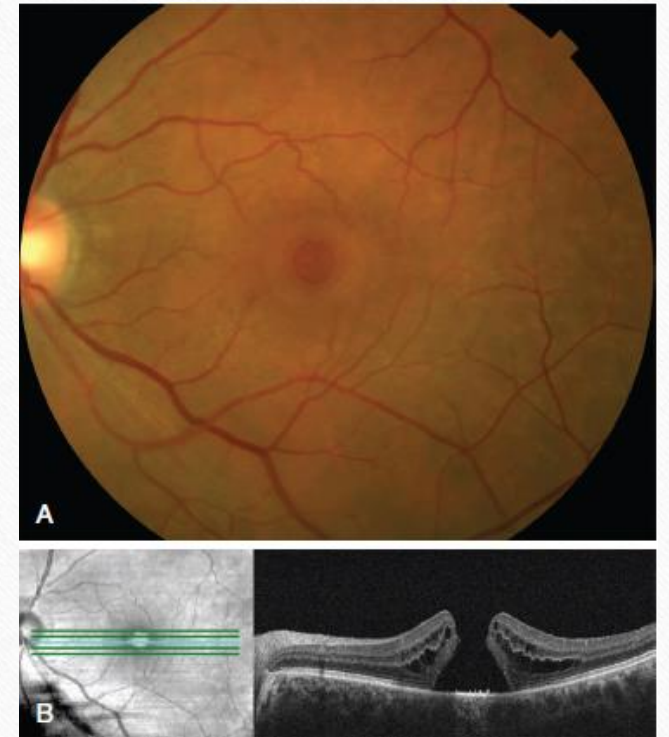
B, Six weeks later, visual acuity decreased to 20/400. Late-phase fluorescein angiography image shows multiple fronds of choroidal neovascularization (CNV) arising from the choroidal ruptures (*arrows*).

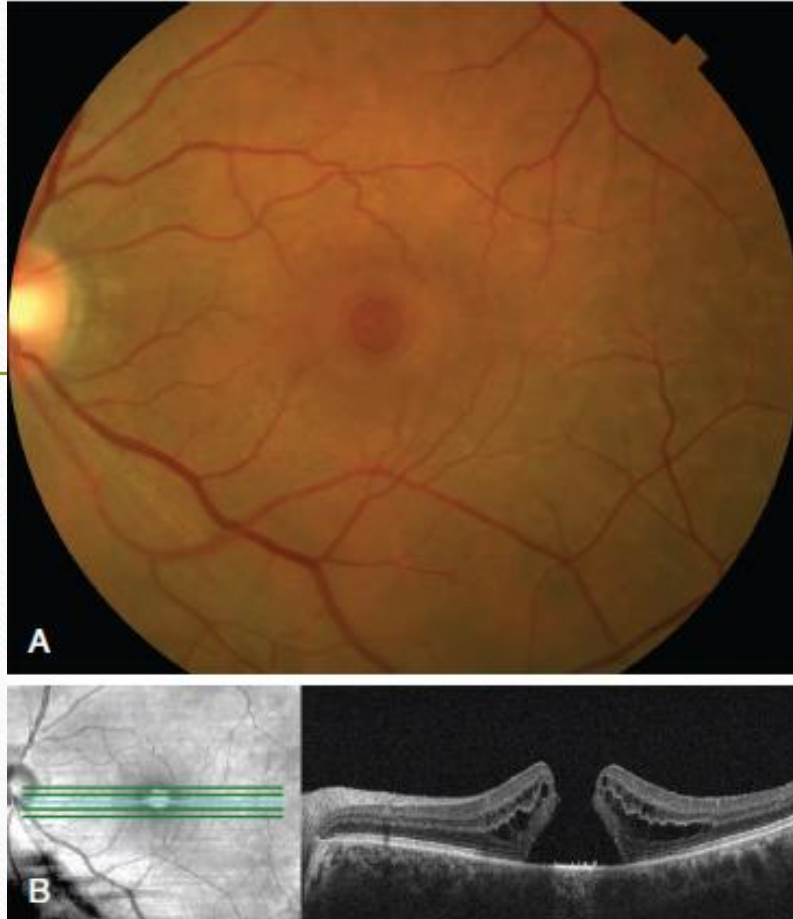
C, Late-phase fluorescein angiography image taken 7 weeks after treatment with corticosteroids and photodynamic therapy shows the CNV has regressed dramatically. **D**, Color fundus photograph taken 8 months after treatment. The scarring around the choroidal ruptures obscures their characteristic appearance. Some pigmentary changes have occurred in the macula as well, but visual acuity is 20/25. (Courtesy of Richard F. Spaide, MD.)



Posterior Segment Manifestations of Trauma

- **Post traumatic Macular Hole:**
 - 1869
 - Foveola is thin 130 μm
 - Blunt trauma by various mechanisms:
 - Contusion Necrosis
 - Vitreous Traction
 - Observed Immediately after trauma: Submacular hemorrhage by choroidal rupture, Severe cystoid macular edema or whiplash separation of vitreous
 - May close spontaneously: two weeks, 3 months, 6 months, 1 year, mean (3 months)

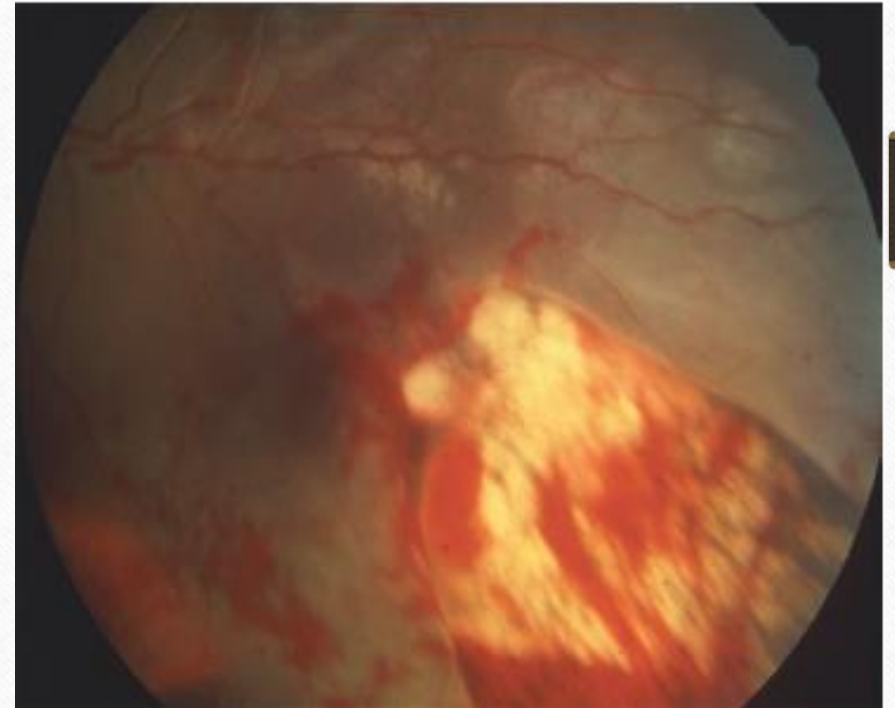


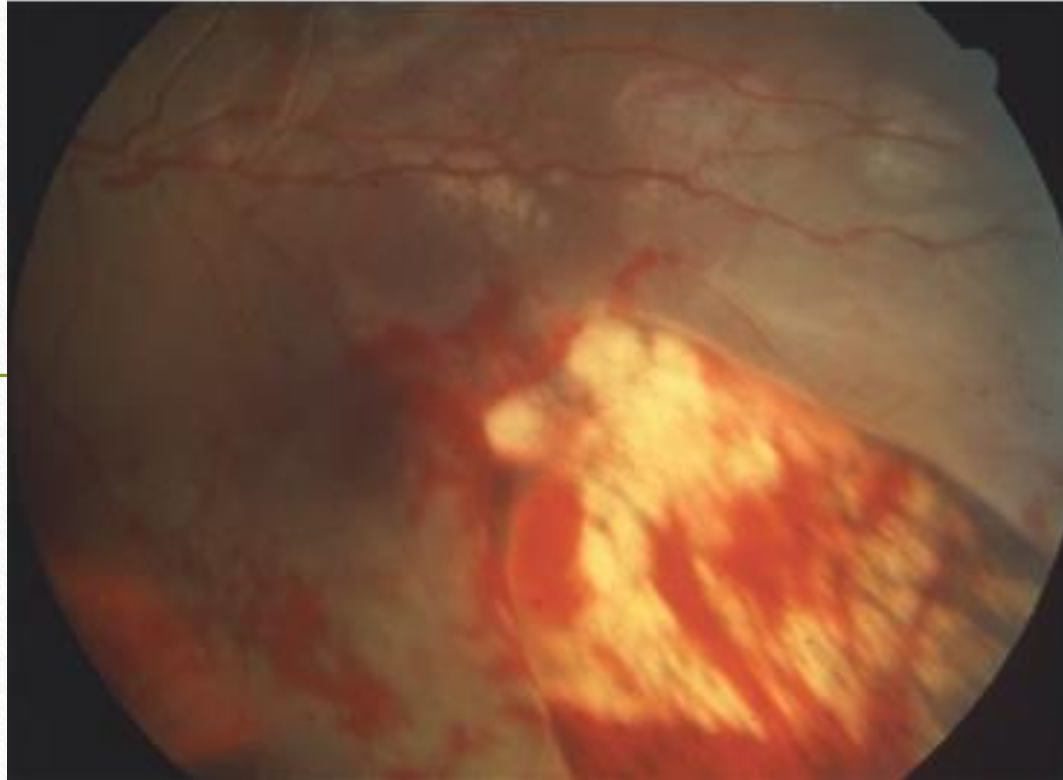


- **Large traumatic macular hole with a cuff of subretinal fluid.**

Posterior Segment Manifestations of Trauma

- **Traumatic chorioretinal disruption (retinal sclopetaria):**
 - **Damage:** Shock waves by deceleration of projectile passing close to the sclera, blunt trauma from paintball injuries may produce similar appearance, Tangential
 - **Prophylaxy: Laser?**





- Sclopetaria. Inferotemporal area of bare sclera, pigment, and hemorrhage in a 19-year-old man after a shotgun injury. Pellets passed tangential to the globe and lodged in the orbit. Ocular findings also included commotion retinae, choroidal rupture, and macular hole.
- (Courtesy of Daniel F. Martin, Cole Eye Institute, reproduced with permission from Elliott D, Avery R. Nonpenetrating posterior segment trauma. *Ophthalmology Clinics of North America*, Volume 4, Number
- 2, December 1994.)

color fundus photograph from a patient shot with a bullet 2 months earlier in the right inferotemporal orbit, causing the sequelae of retinal sclopetaria. The bullet's path missed the globe by several millimeters, and the patient acutely lost visual acuity. The image shows large areas of subretinal proliferation and retinal pigment epithelial hyperplasia, consistent with moderate to severe retinal sclopetaria. Visual acuity returned to 20/40. (Courtesy of Richard F. Spaide, MD.)



Posterior Segment Manifestations of Trauma

- Scleral Rupture:
 - Severe blunt injuries can rupture the globe
 - ♯ most common locations are limbus, posterior to insertion of rectus muscles, mid quadrants
 - Previous surgical wounds
 - Boggy chemosis with hemorrhage (ecchymosis)
 - Deep AC, shallow AC, severe vitreous hemorrhage
 - IOP: Reduced, elevated
 - R/O: IOFB

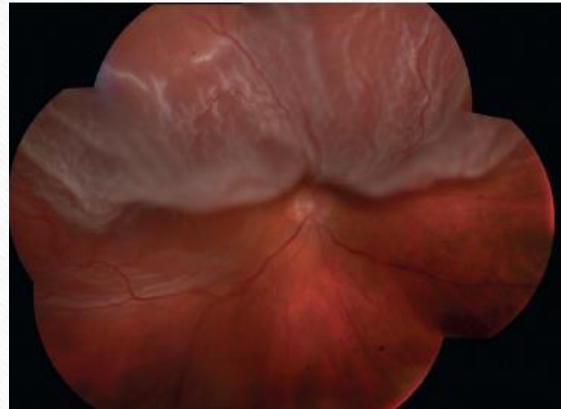
- **Traumatic RD:**

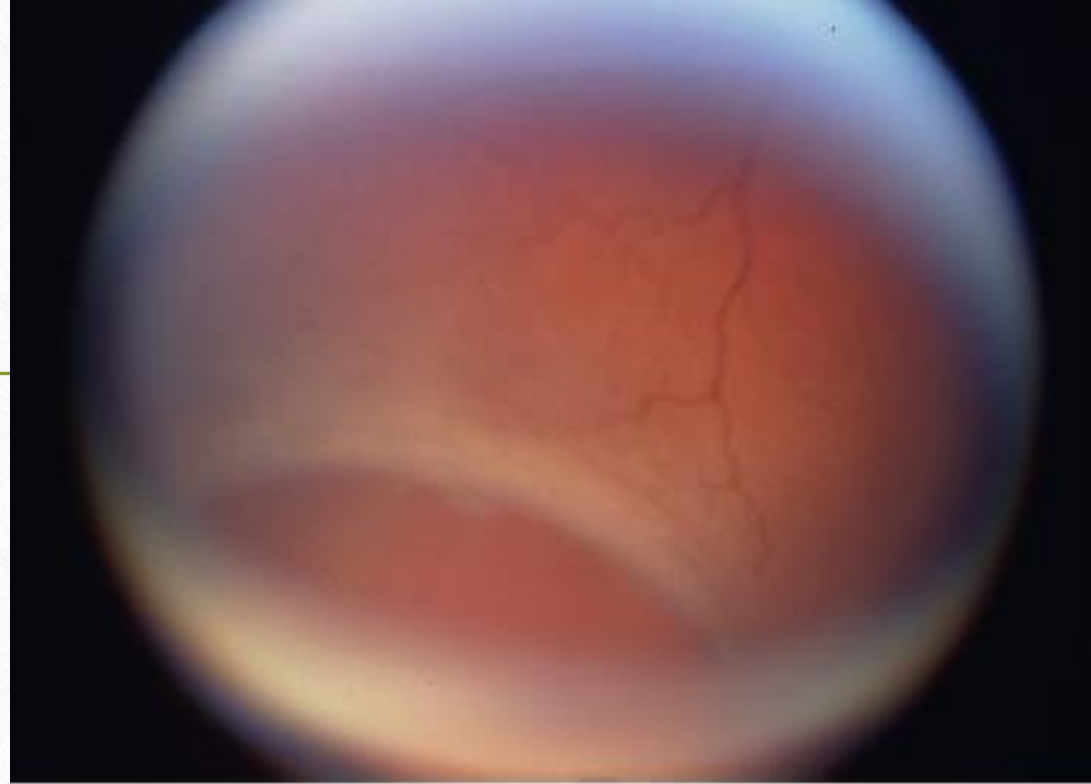
- **Dialysis** ۵۳%

- **Giant tear** ۱۶%

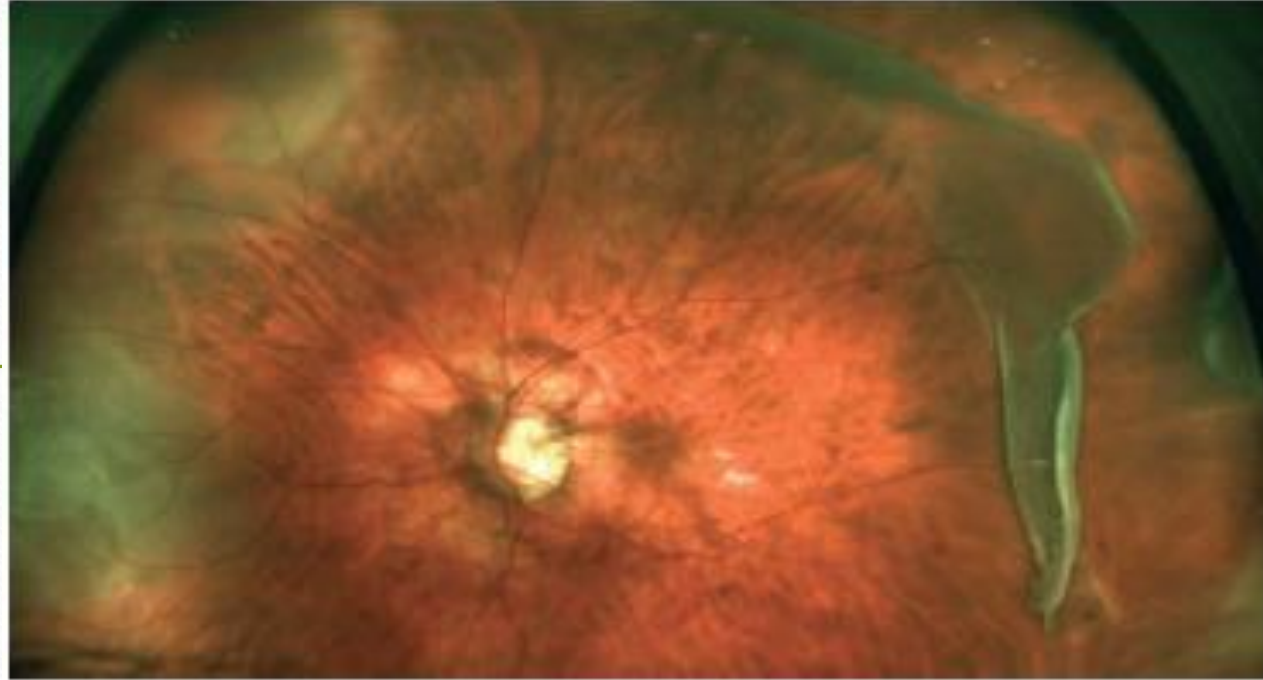
- **Flap Tear** ۱۱%

- **Tear in lattice** ۸%

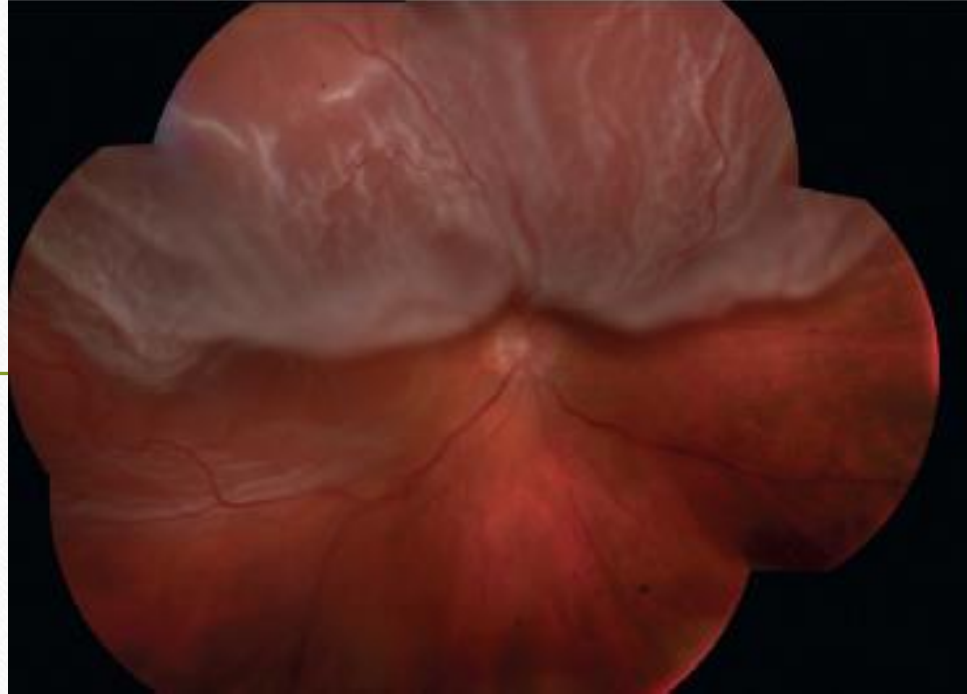




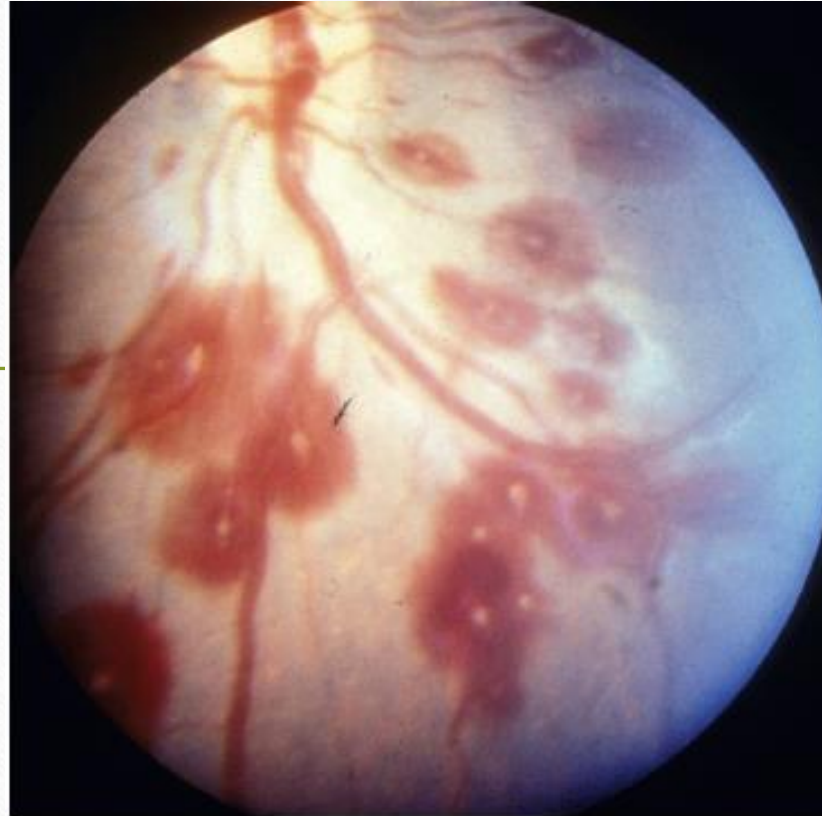
- Inferotemporal retinal dialysis in a 65-year-old woman who suffered blunt ocular trauma 7 years prior in a motor vehicle accident. Visual acuity is 20/30. The patient underwent scleral buckling surgery.
- *(Reproduced with permission from Elliott D, Avery R. Nonpenetrating posterior segment trauma. Ophthalmology Clinics of North America, Volume 4, Number 4, December 1994.)*



- Temporal giant retinal tear and associated retinal detachment.
- There is also a nasal retinal detachment. *(Courtesy of Yoshi Yonekawa and George Williams, Associated Retina Consultants, William Beaumont Hospital.)*



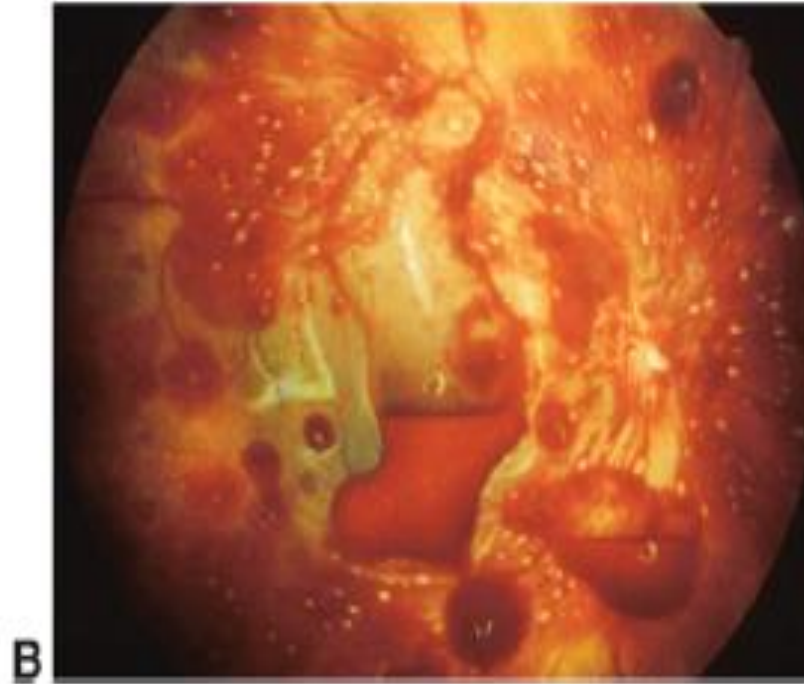
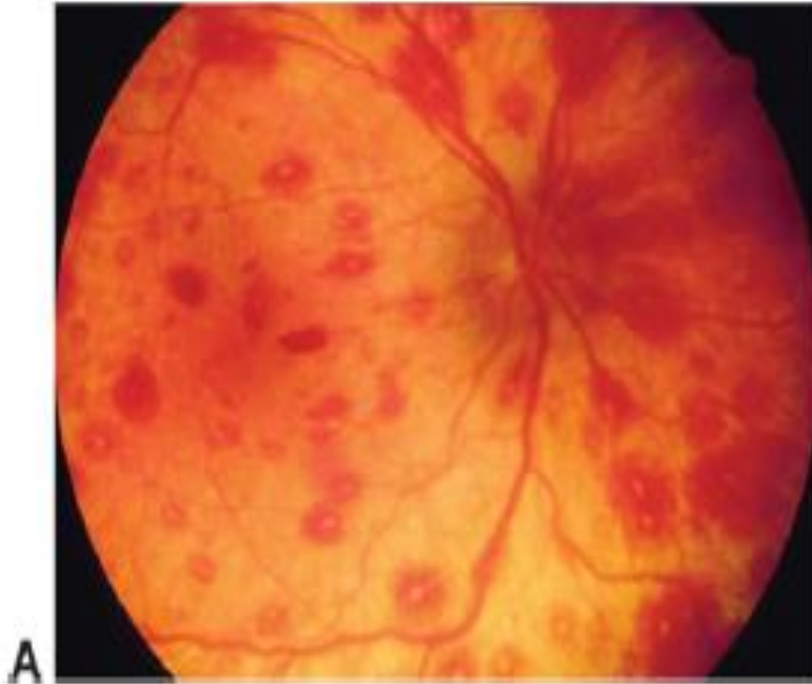
Traumatic retinal detachment involving the macula.



- Presumed shaken baby syndrome. Multiple white-centered intraretinal hemorrhages in an 18-month old boy who was found unresponsive with multiple fractures. He was admitted to the intensive care unit for suspected child abuse. *(Reproduced with permission from Elliott D, Avery R. Nonpenetrating posterior segment trauma. Ophthalmology Clinics of North America, Volume 1, Number 4, December 1990)*

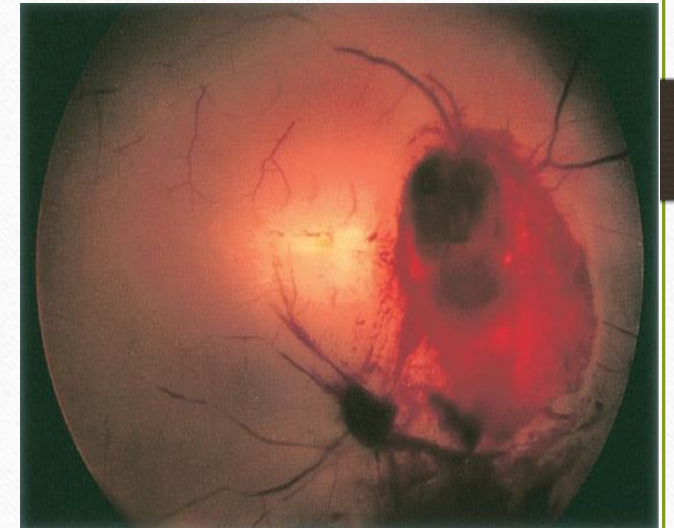
Color fundus photographs from a patient with abusive head trauma causing preretinal and retinal hemorrhages. **A**, Image taken several days after hospital admission, by which time many of the smaller hemorrhages had started to resorb.

B, Numerous hemorrhages are located on and within the retina, and regions of hemorrhagic retinoschisis are observed centrally. Because the baby was upright, the red blood cells sank down into a dependent position within the larger regions of hemorrhagic retinoschisis. Some of the hemorrhages were white centered, whereas others had reflections of the flash from the fundus camera. (Used with permission from Spaide RF, Swengel RM, Scharre DW, Mein CE. *Shaken baby syndrome*. Am Fam Physician. 1990;41(4):1145-1152.)

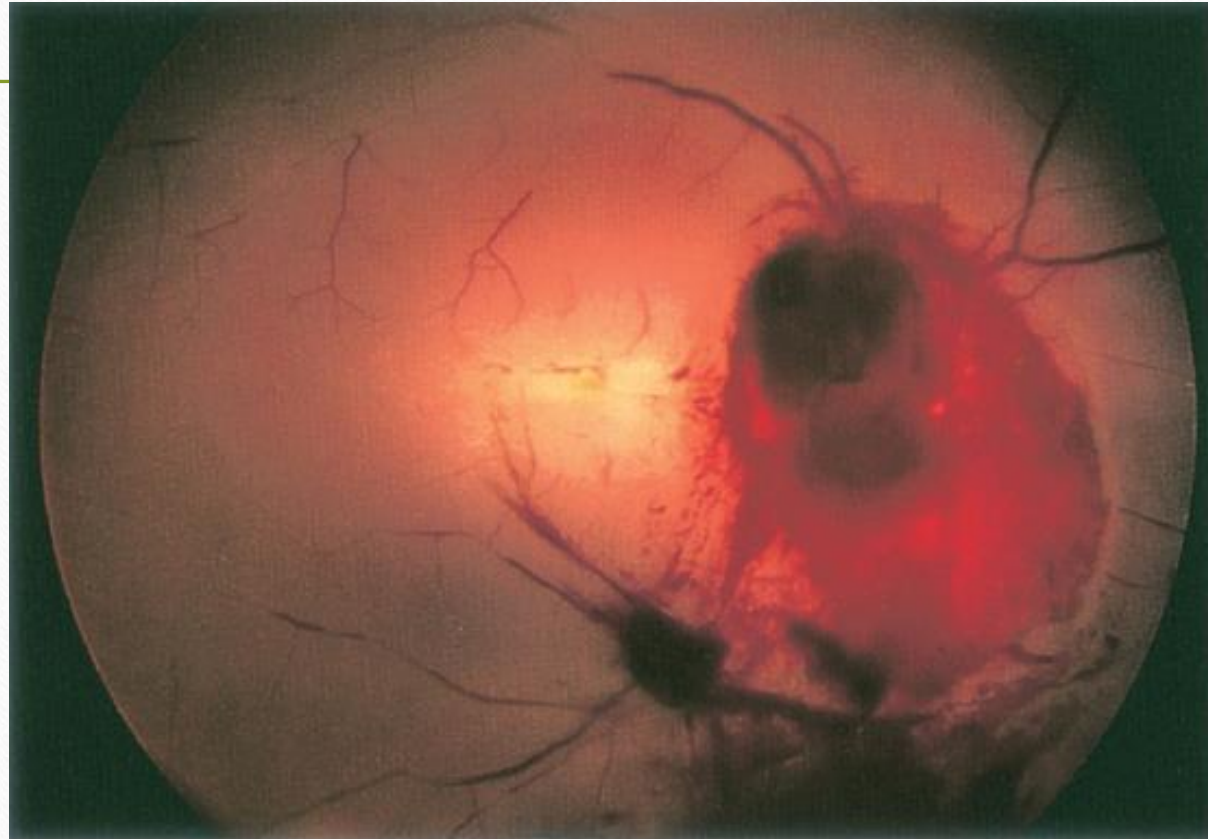


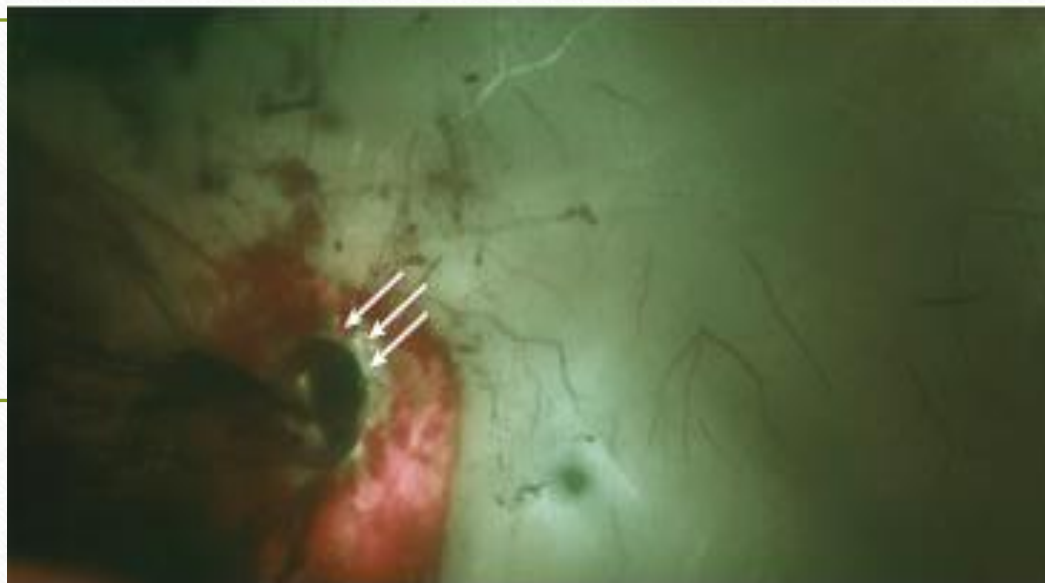
Posterior Segment Manifestations of Trauma

- **Avulsion of the Optic Disc:**
 - **Extreme rotation and forward displacement of the globe**
 - **Penetrating orbital injuring causing a backward pull on the optic nerve**
 - **Sudden increase IOP causing rupture of the lamina cribrosa**
 - Total (complete), Incomplete**
 - **Total loss of VA**



Avulsion of the optic nerve head. In this color fundus photograph, the nerve is obscured by hemorrhage, and a mixed vascular occlusion is present





- Avulsed optic nerve in a 15-year-old boy who presented with immediate vision loss after he fell onto a rock, striking his left eye.
- There were no signs of globe rupture or laceration. The area of the optic nerve head was excavated and filled with hemorrhage (*arrows*) with blood emanating into the vitreous. There was also a ring of peripapillary hemorrhage and central retinal artery occlusion. (*Reproduced*
- *with permission from Modjtahedi et al. Optic nerve head avulsion: Clinical, radiographic and sonographic correlations. Ophthalmology, 2014, volume 122, issue 12, page 2442.*)

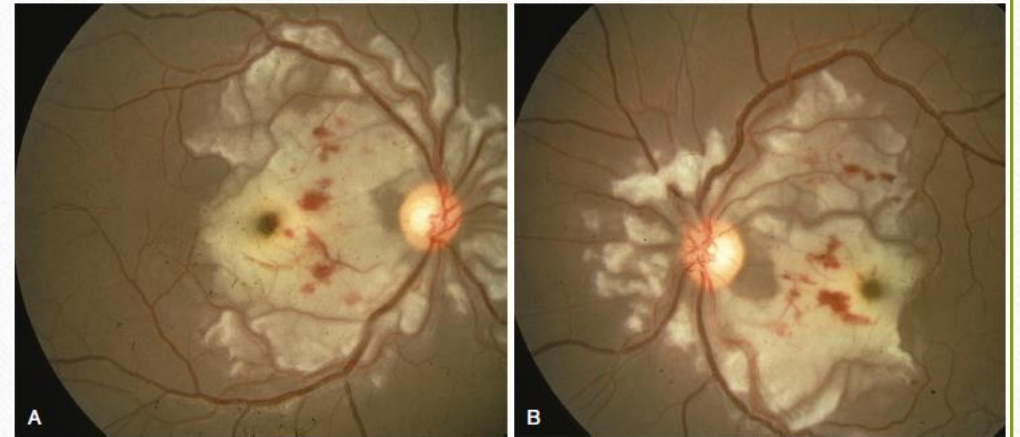
Posterior Segment Manifestations of Trauma

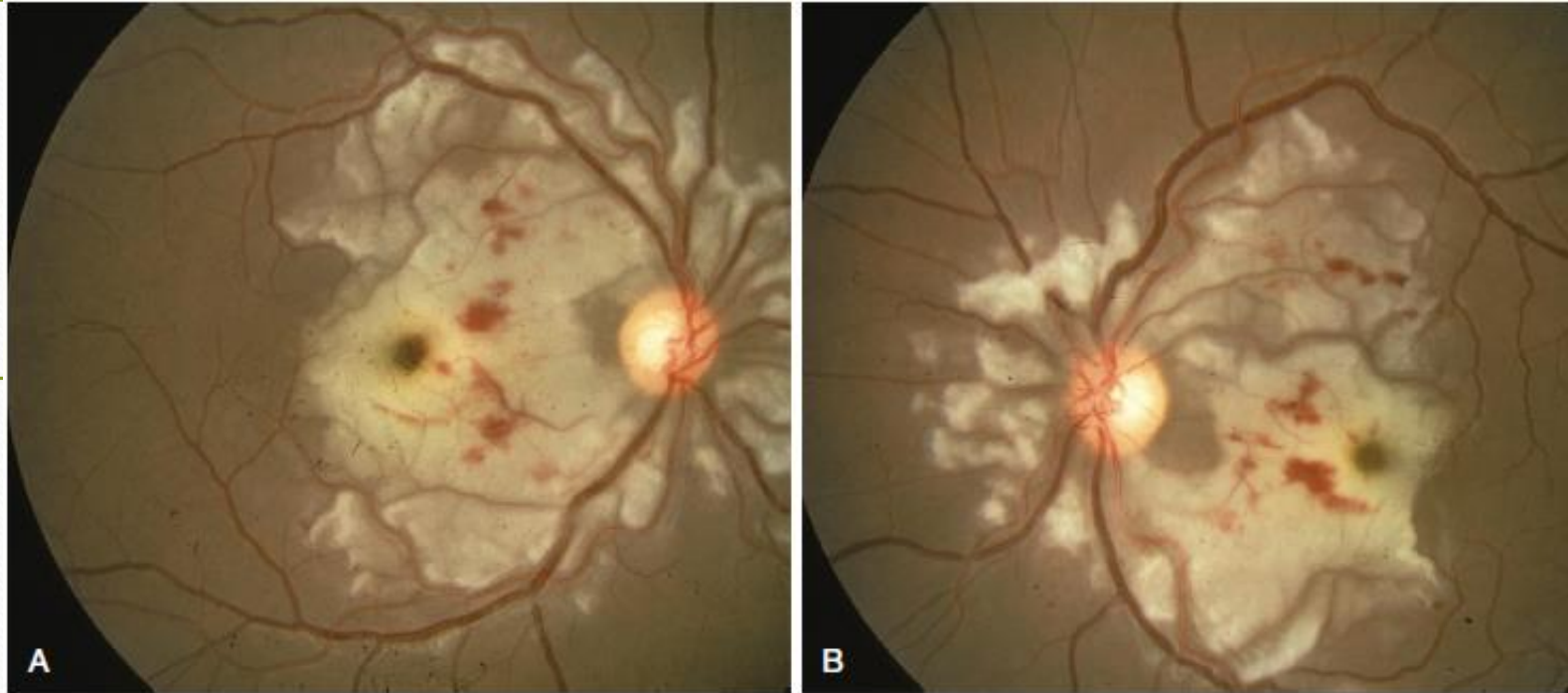
Indirect Ocular Injury:

■ Purtschuer retinopathy:

- 1910

- Multiple patches of superficial retinal whitening, Intraretinal hemorrhage, papillitis in severe head trauma
- Pancreatitis, long bone fracture, chest compression, child birth
- Fat embolization, Granulocyte aggregation, leukoemboli



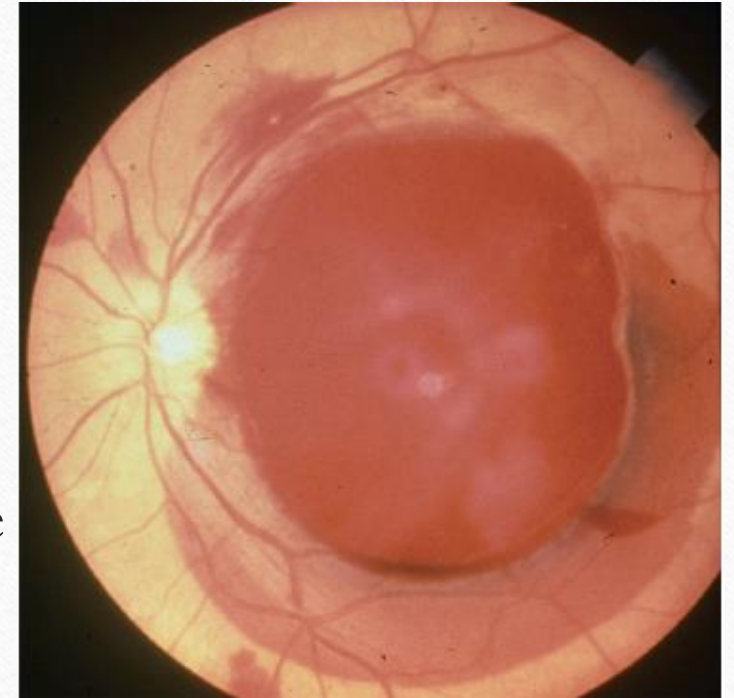


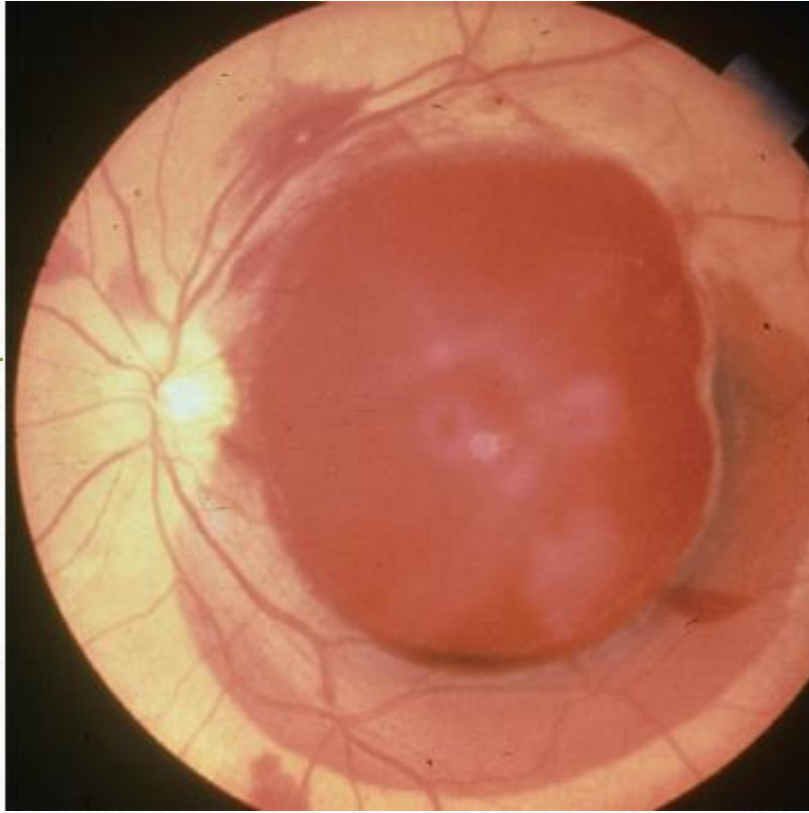
- Purtscher retinopathy. (A) Right eye demonstrating patches of superficial retinal whitening throughout the posterior pole in a 30-year-old man 2 days after he was assaulted and suffered head trauma. Visual acuity is 20/100 in both eyes. (B) Left eye shows symmetric involvement.
- (Reproduced with permission from Elliott D, Avery R. Nonpenetrating posterior segment trauma. Ophthalmology Clinics of North America, Volume 8, Number 4, December 1995.)

Posterior Segment Manifestations of Trauma

Indirect Ocular Injury:

- Terson Syndrome
- 1881
- Retinal and vitreous hemorrhage after subarachnoid hemorrhage
- Pathogenesis: Controversial, subarachnoid hemorrhage can dissect the optic nerve sheath



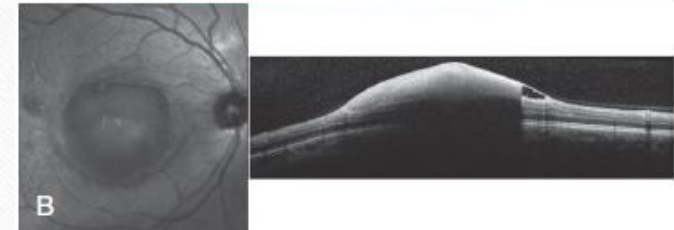


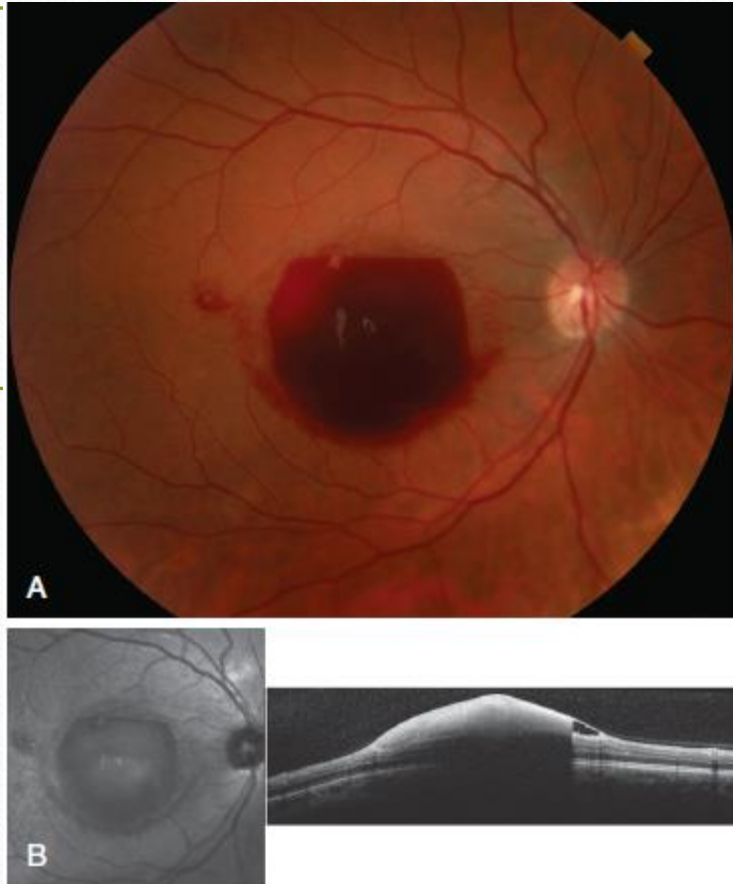
- Terson syndrome with hemorrhages in multiple layers. There is a large sub-internal limiting membrane hemorrhage, multiple intraretinal white-centered hemorrhages, and a large area of subretinal hemorrhage.

Posterior Segment Manifestations of Trauma

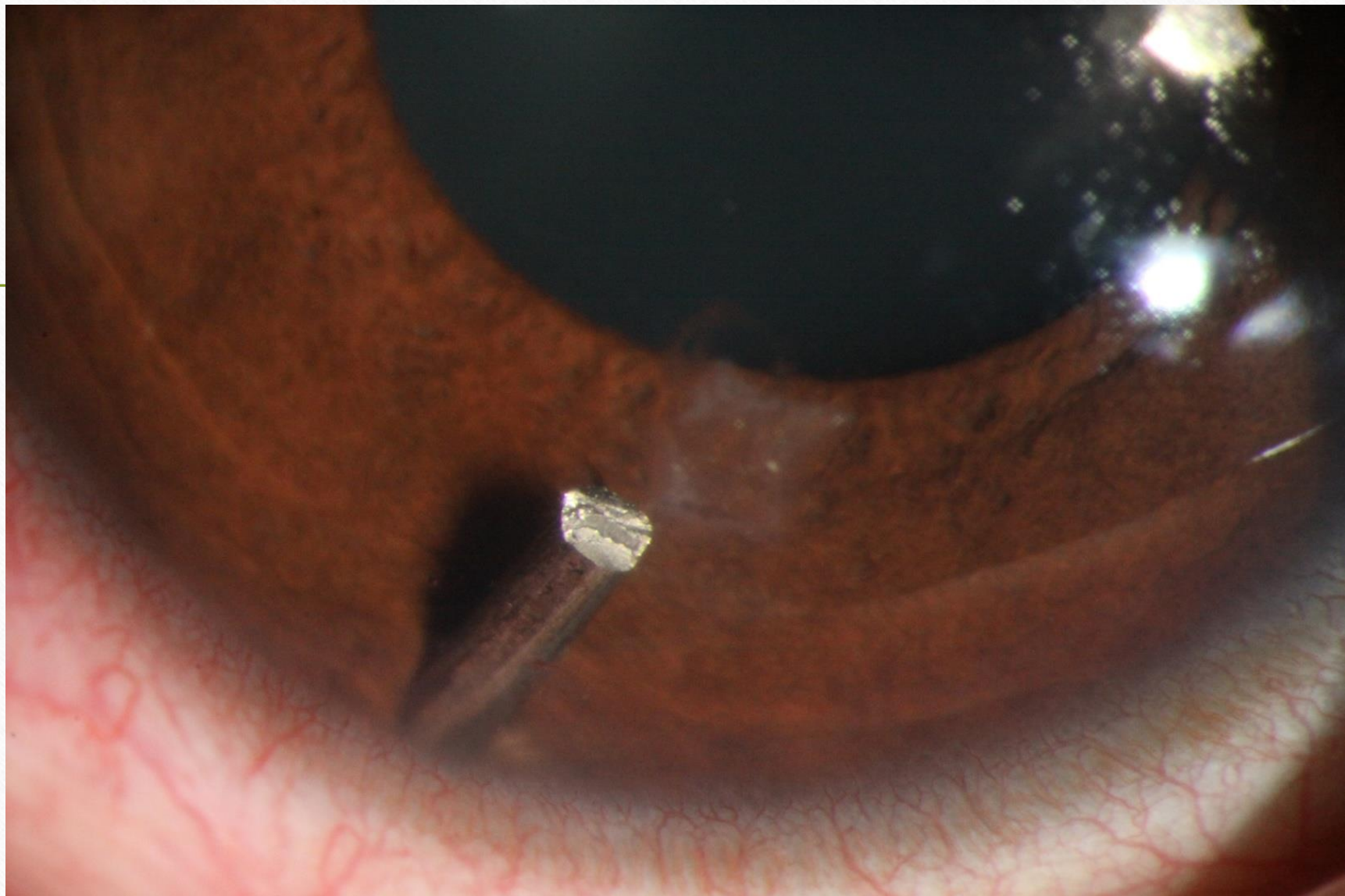
Indirect Ocular Injury:

- Valsalva Retinopathy
- Intrathorasic and intraabdominal pressure

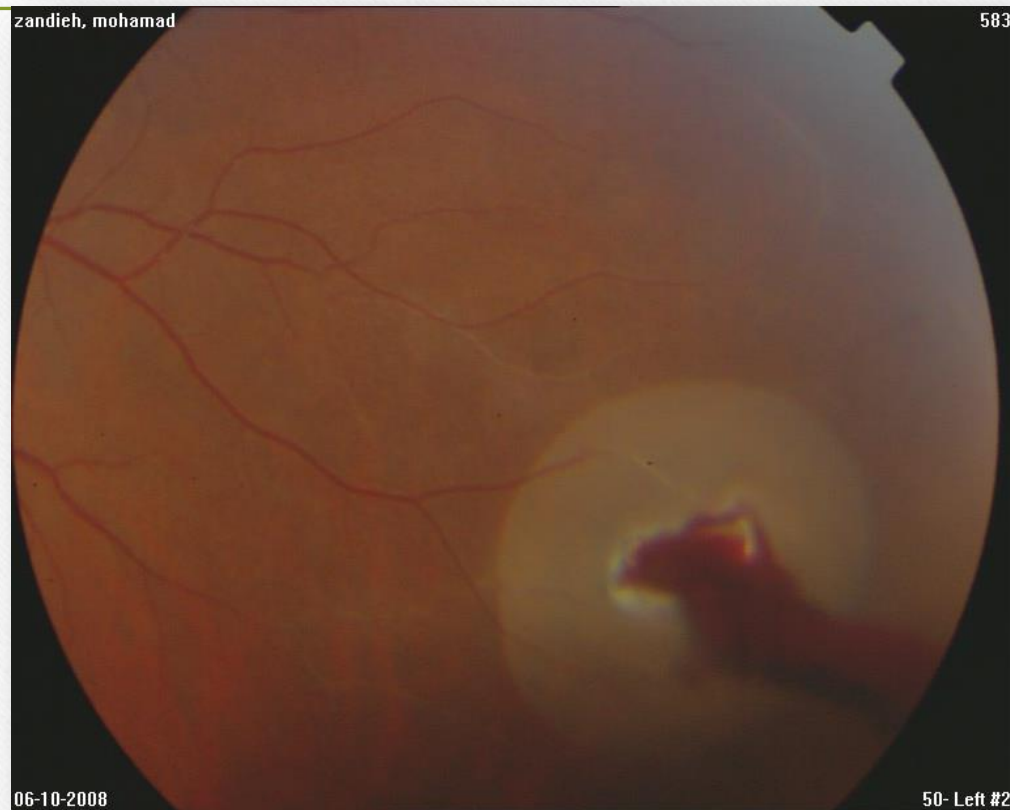




- (A) Valsalva retinopathy associated with coughing after waking from general anesthesia in a 41-year-old woman. There is a sub-internal limiting membrane (ILM) hemorrhage in the macula. (B)
- Vertical optical coherence tomography scan showing the sub-ILM hemorrhage.



- جسم خارجی فرو رفته در شبکیه



برخورد ترقه



1.0s /HE 16:30:15/00.00
W:300 L:35

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S 63

FARABI HOSPITAL

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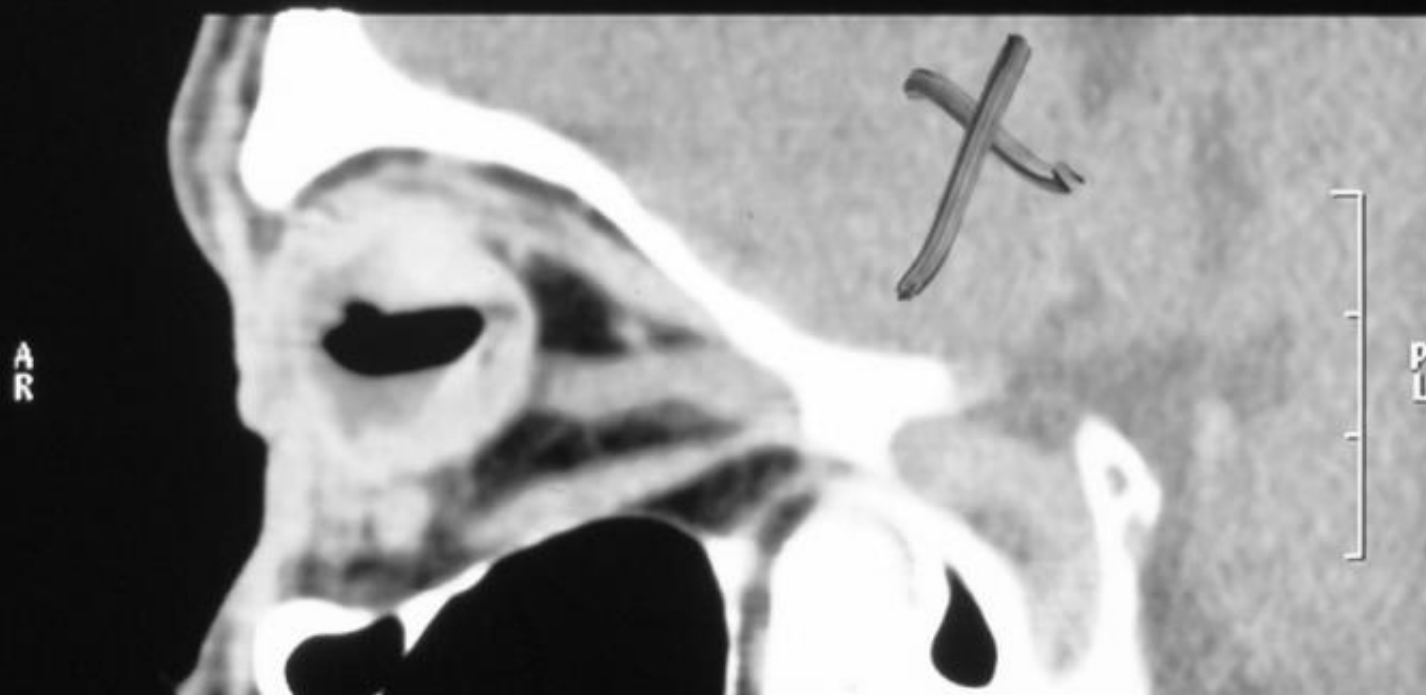
BADRKHANI ALI

M 24 88158996

DFOV 13.0cm
DETL/I/

Feb 25 2010

512



Specimen:

Post Op. Diagnosis:

IOFB

12x21mm

X



Open-globe injury, CT

تشخيص بعد از عمل:

Dx: Extensive Corneolimboscleral

laceration + Uveovitreous prolapse

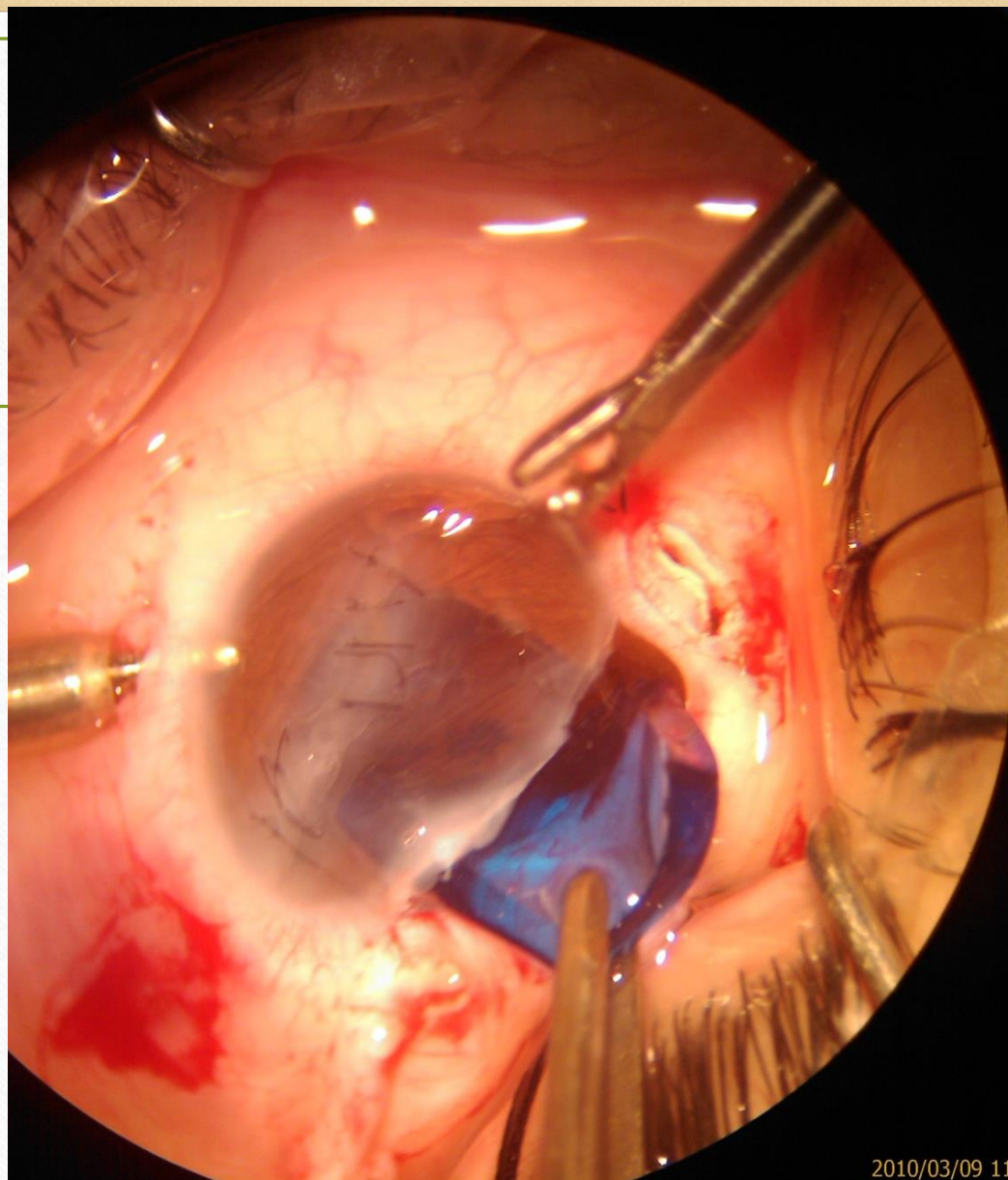
Small retinal detachment

ترکیدن لامپ ماشین در دست





Metallic ?
Glass ?
Size of IOFB ?

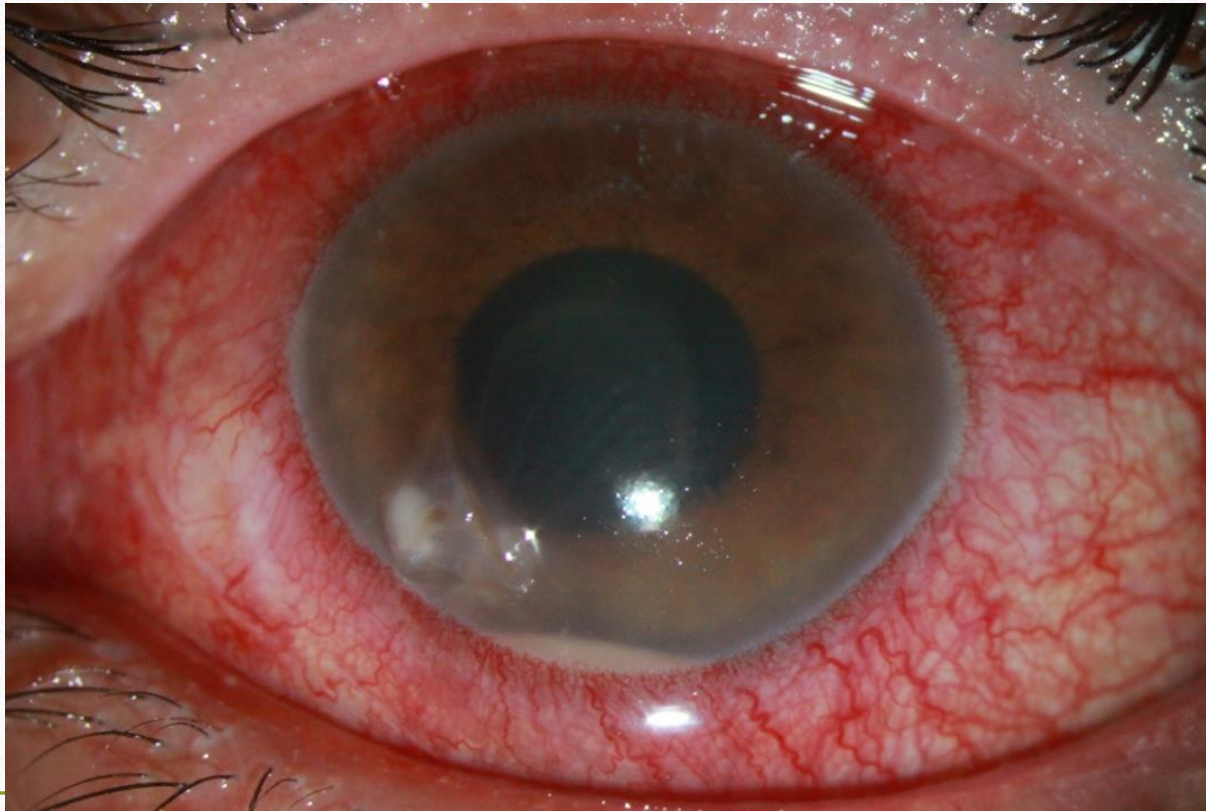


2010/03/09 11:3

برخورد سیم مفتول ،
خارج نموده است



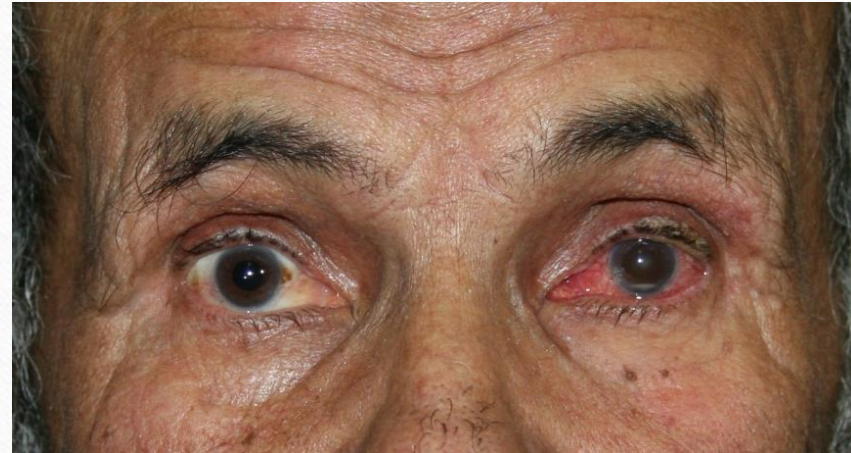
Sealed Traumatic Endophthamitis

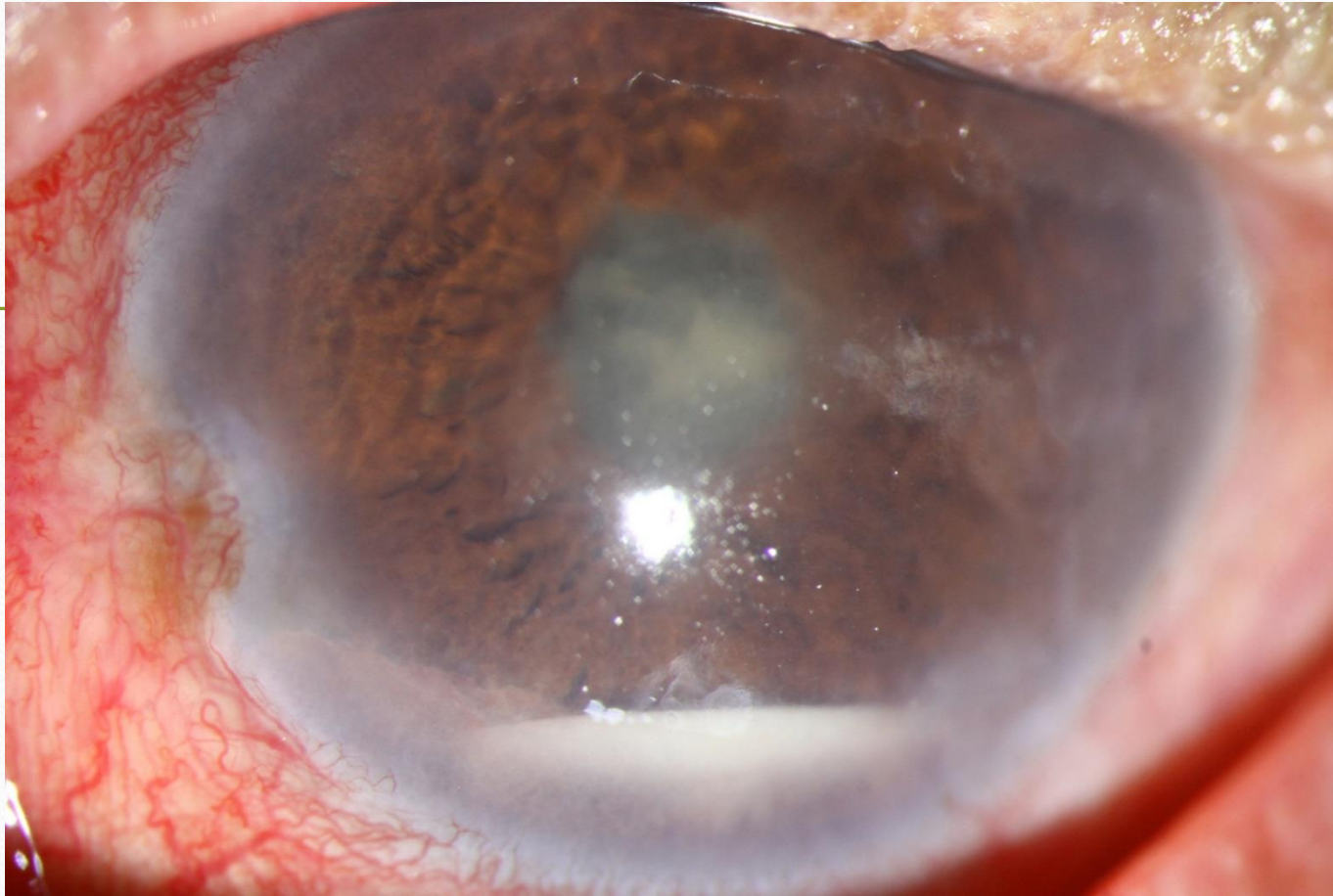


Toxic, Inflammatory & Infectious Complications Following Cataract Surgery

- Cataract surgery
- I go to trip , I will see you after ۱۲ days
- Pain : from same day
- Colleague : didn't examine
- Examination :
 - VA : LP
 - PAS
 - Adhesion to the IOL

H. Khorshidvand



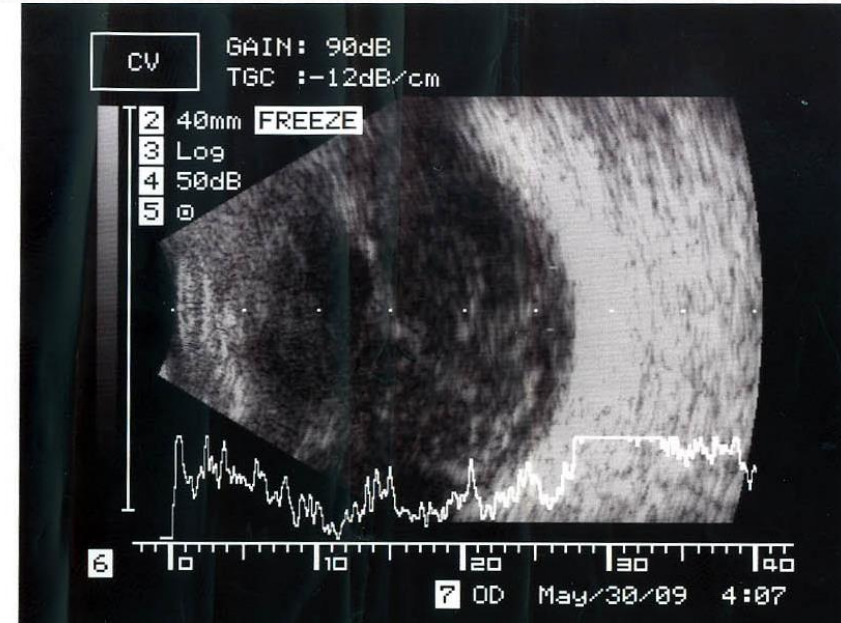
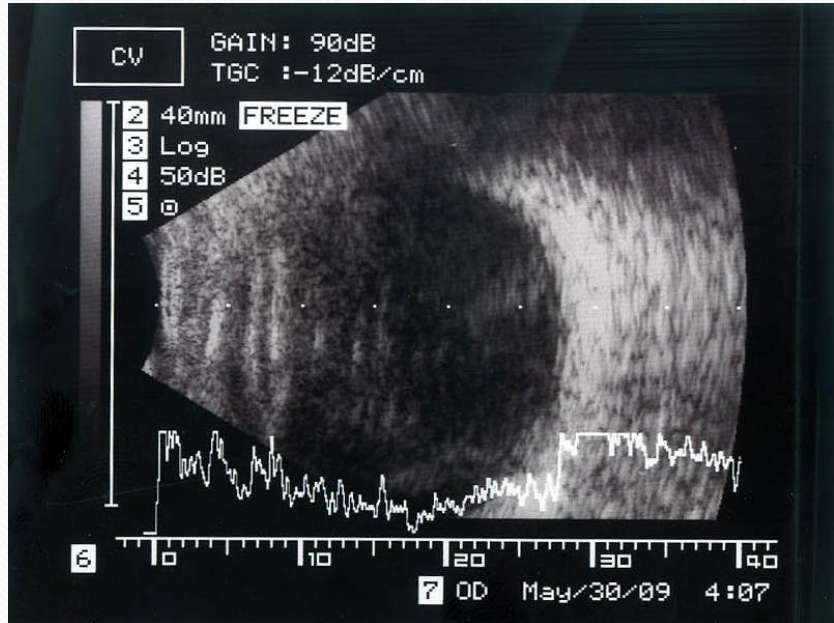


Post cataract endophthalmitis
VA: LP

Post cataract endophthalmitis VA: LP



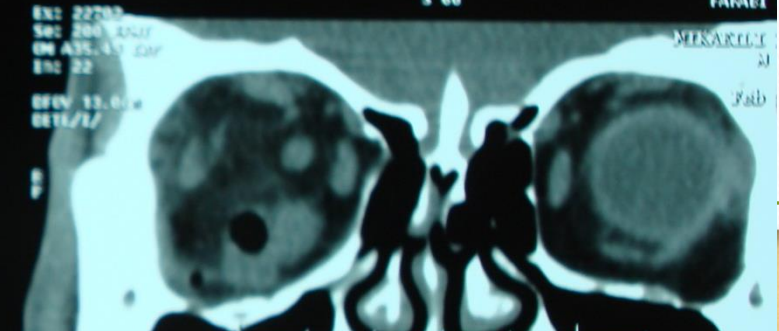
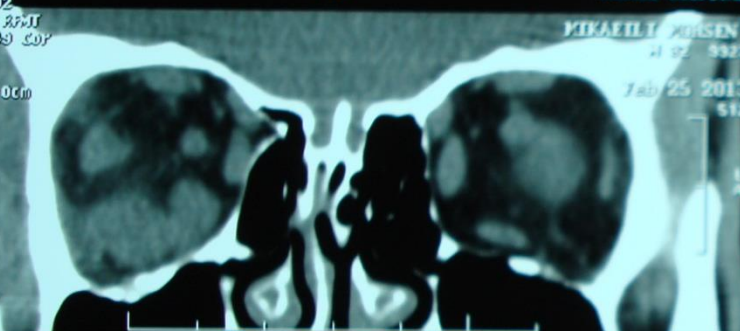
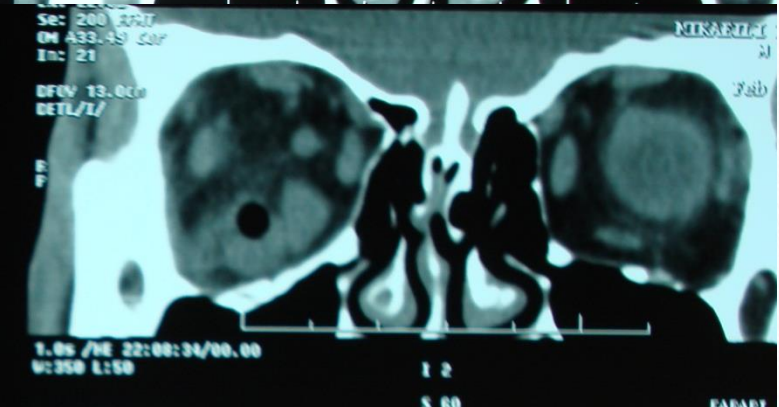
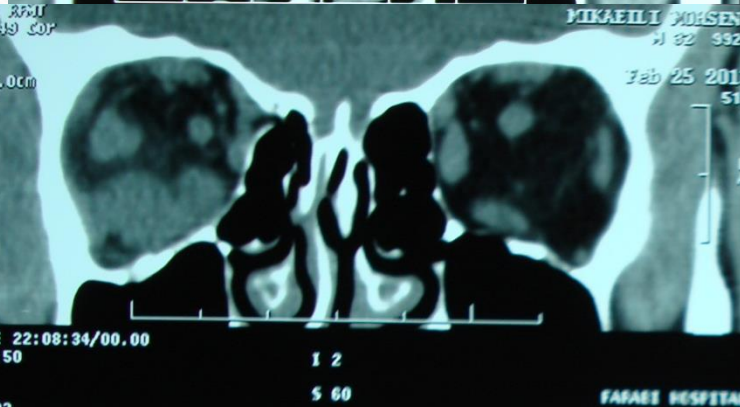
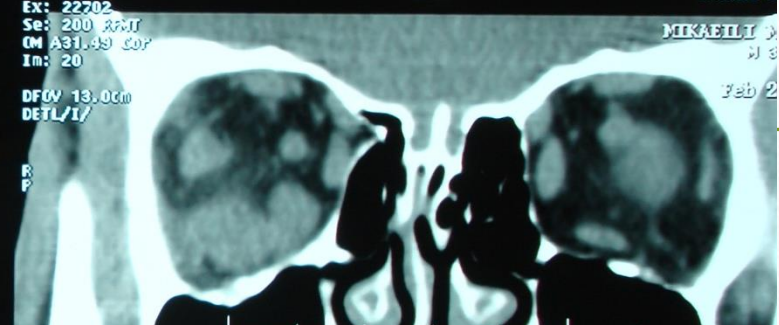
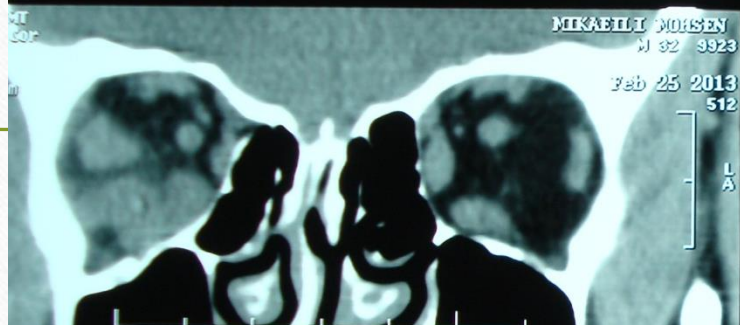
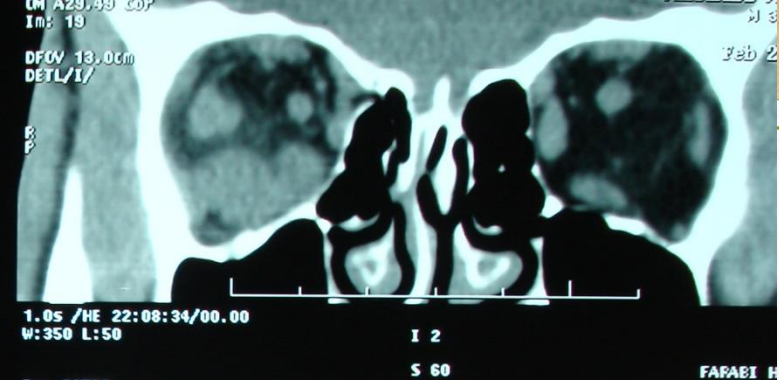
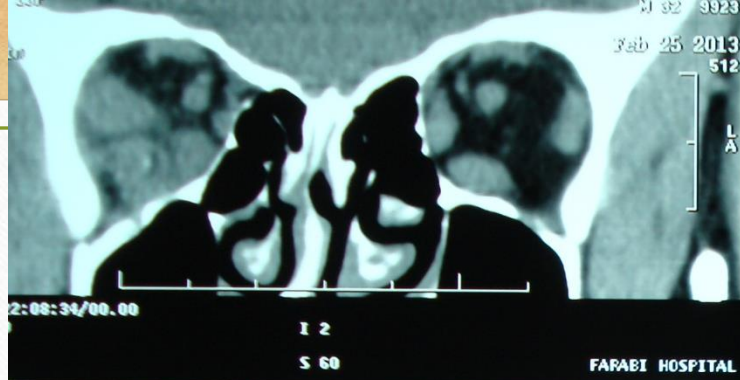
Toxic, Inflammatory & Infectious Complications Following Cataract Surgery



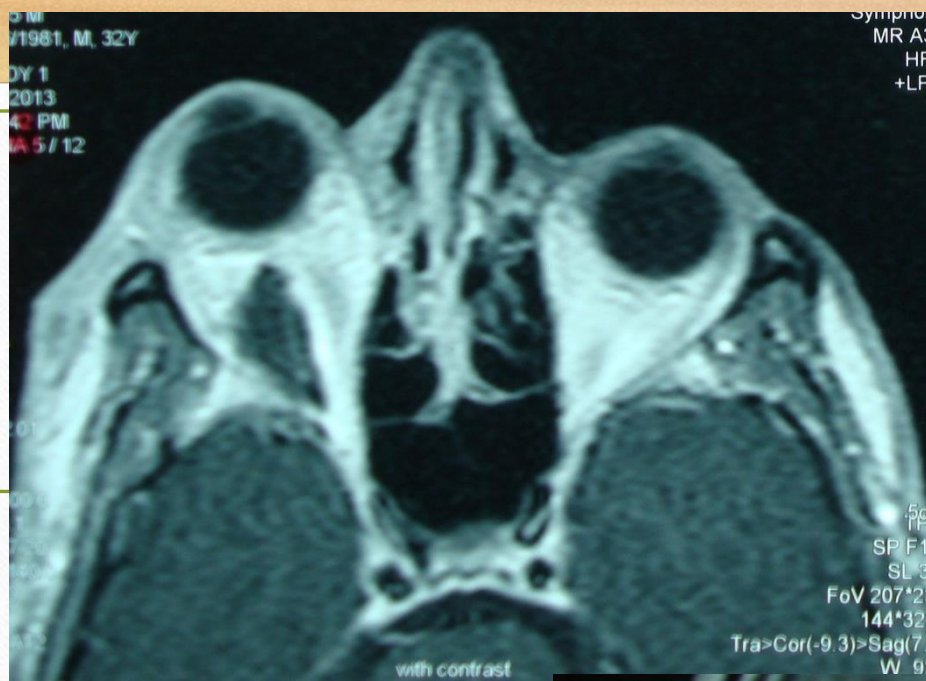
B-Scan: vitreous abscess



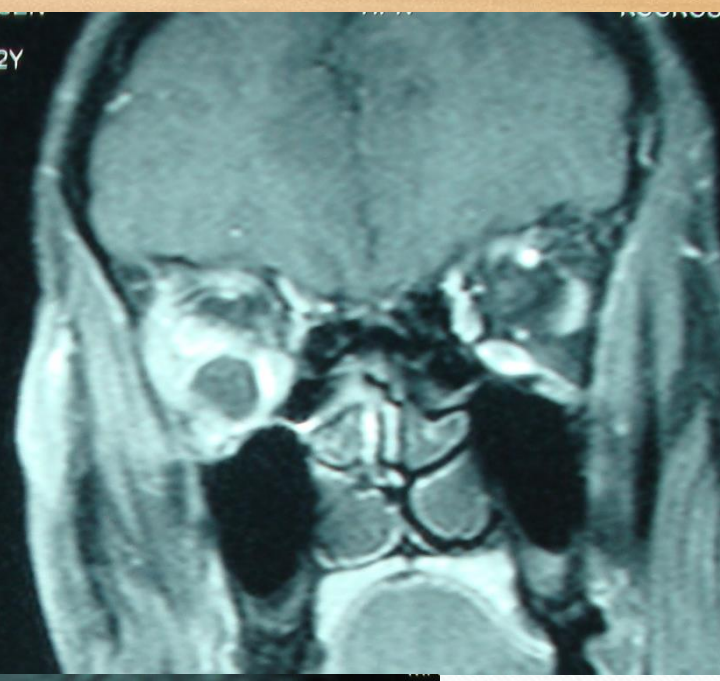




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43 PM
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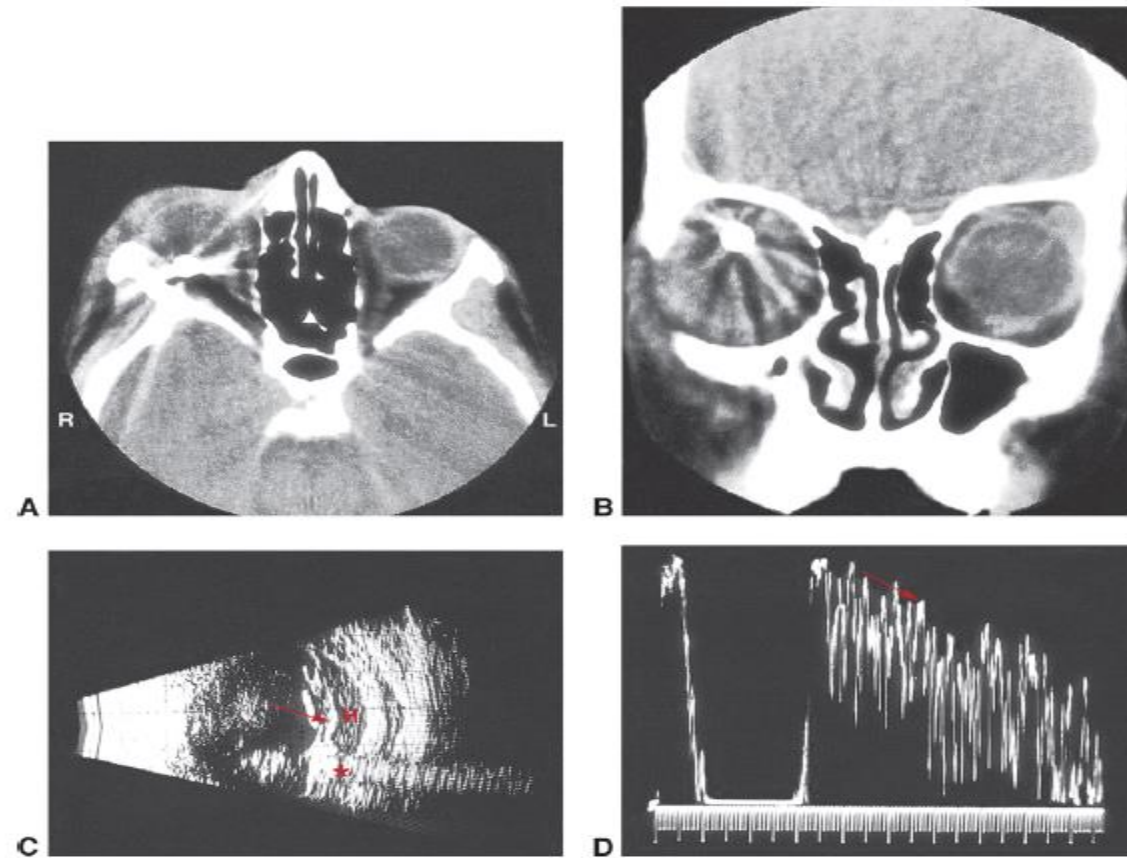


Symphon
MR A3:
HF2Y
+LP



SP F1
SL 3
FoV 207*23
144*320
Tra>Cor(-9.3)>Sag(7.1)
W 93

Images from a patient with an intraocular BB pellet. Axial **(A)** and coronal **(B)** computed tomography views show the pellet's position to be in the superior and posterior globe. B-scan echography **(C)** shows retinal detachment (*arrow*) and subretinal hemorrhage (*H*). A characteristic reverberation of echoes between the front and back surfaces of the round pellet gives a "trail of echoes" artifact that extends posterior to the foreign body on B-scan (*asterisk*) and on A-scan **(D)** (*arrow*).









پیار از حسن

نوعه صفا

