

Ocular trauma

PRESENTING SYMPTOM

EMERGENCY

VERY URGENT

URGENT

Sudden

- loss of vision
- onset of pain

Trauma

- blurring of vision
- “Something in the eye”

Acute redness of the eye

Suddenly unequal pupil

Evaluation needed:

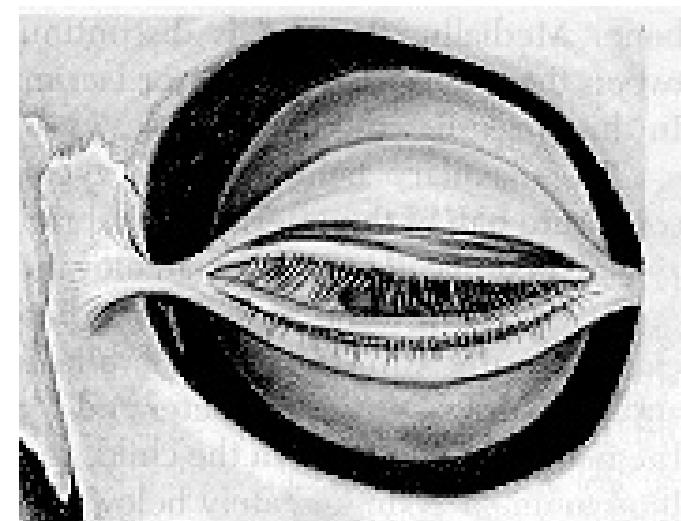
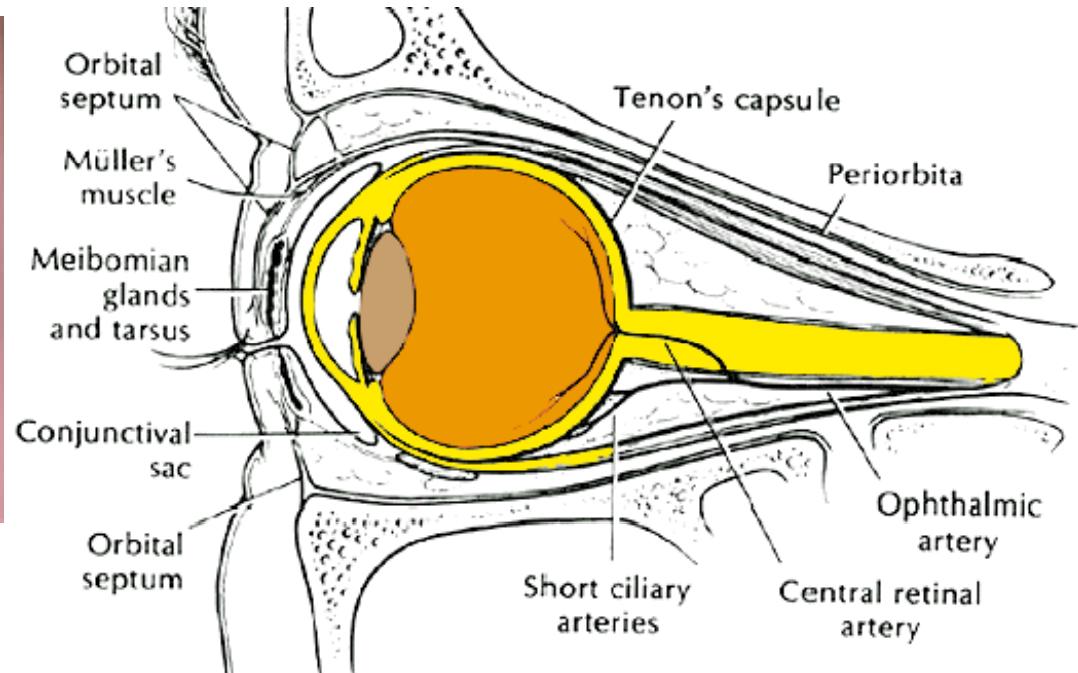
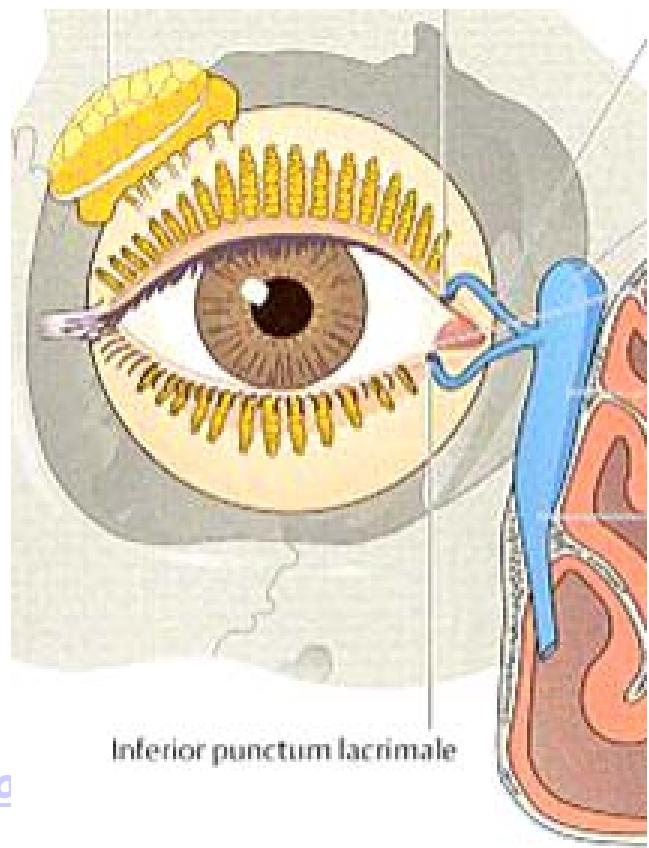
Immediately

Within a few hours

Within one day

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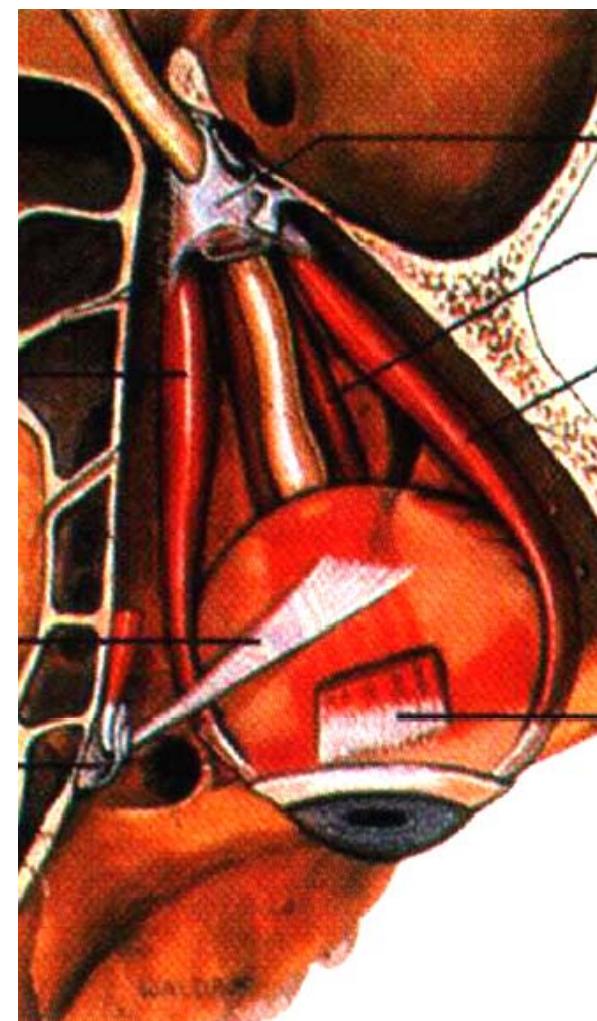
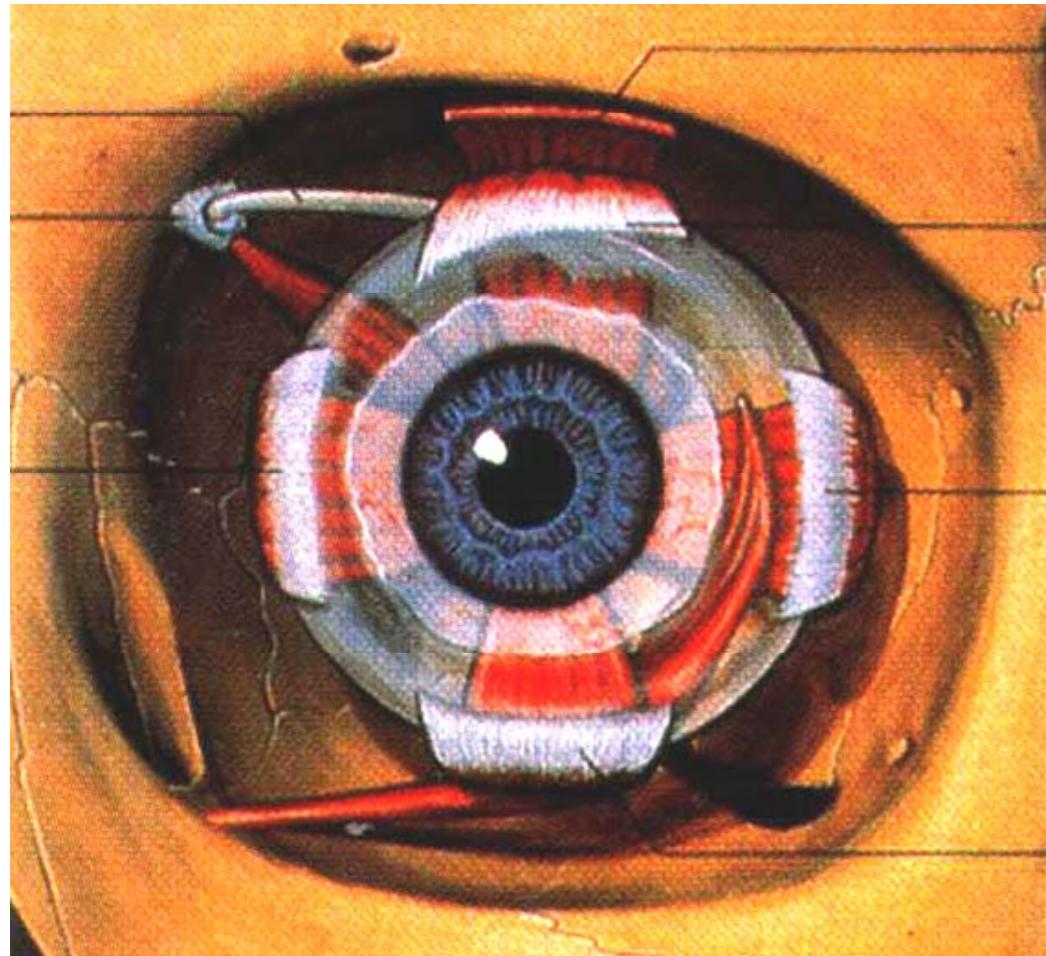
Immediately	Within a few hours	Within one day
EMERGENCY	VERY URGENT	URGENT
Retinal arterial occlusion	<u>Perforation</u> <u>Rupture</u>	Orbital cellulitis Orbital injury
Chemical burns	Acute glaucoma Sudden congestive proptosis	Corneal ulcer <u>Corneal abrasion</u> <u>HypHEMA</u>
		Intraocular foreign body Retinal detachment Macular edema



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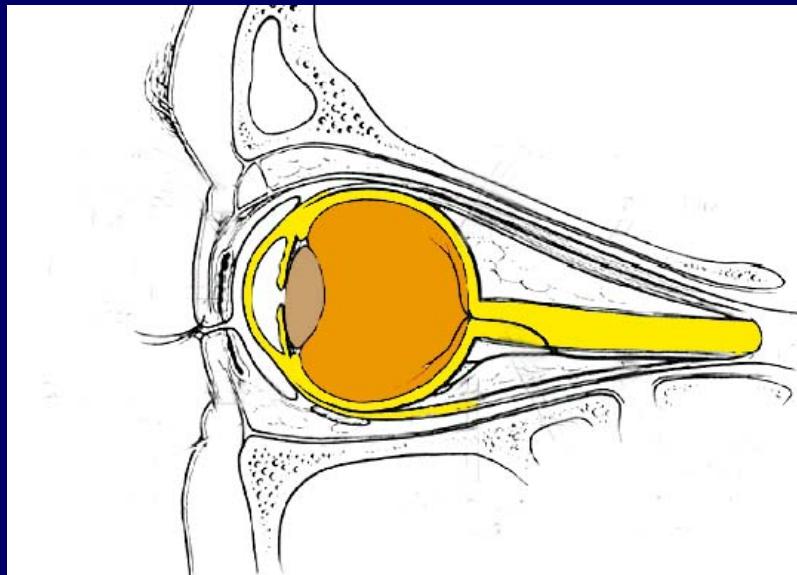
Ocular Trauma

Laceration, ptosis

VH

retina edema , RD

subconj. hemorrhage



Optic neuropathy

abrasion, perforation

hyphema

Mydriasis, RAPD +

blow out fracture

sublux., dislocate, cataract

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VISION HISTORY

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

Complete eye examination



- Vision
- External examination
- Pupils
- Motility examination
- Anterior segment
- Ophthalmoscopy
- Intraocular pressure
- Visual field

VA chart



- < 20/400 ← blindness / VF < 10°
- 20/200
- 20/100
- 20/80 ← low vision / 30° < VF < 10°
- 20/60
- 20/50 ← 
- 20/40
- 20/30
- 20/25 ← normal vision
- 20/20
- 20/15

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- ⌚ Final visual outcome depends on prompt, appropriate
 - 😊 diagnosis
 - 😊 treatment.

Lid laceration



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Lid laceration

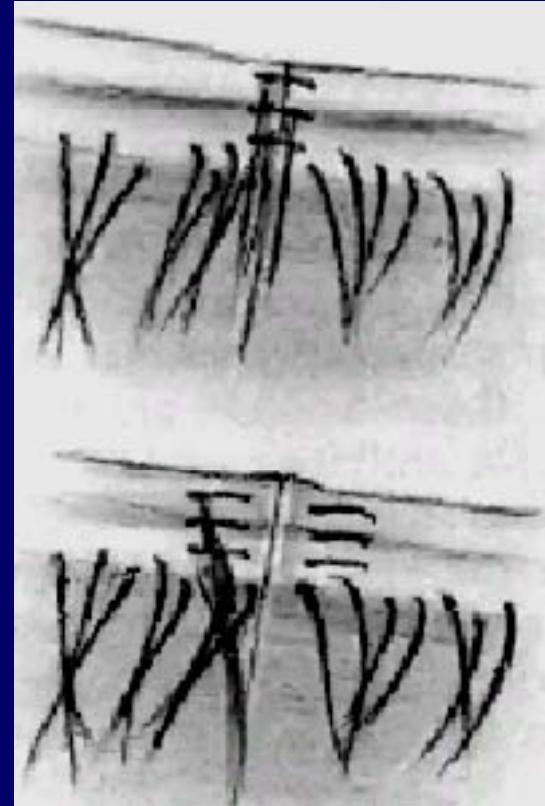
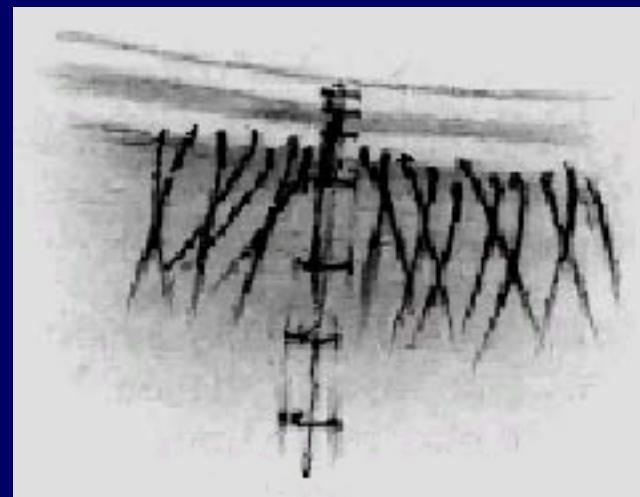
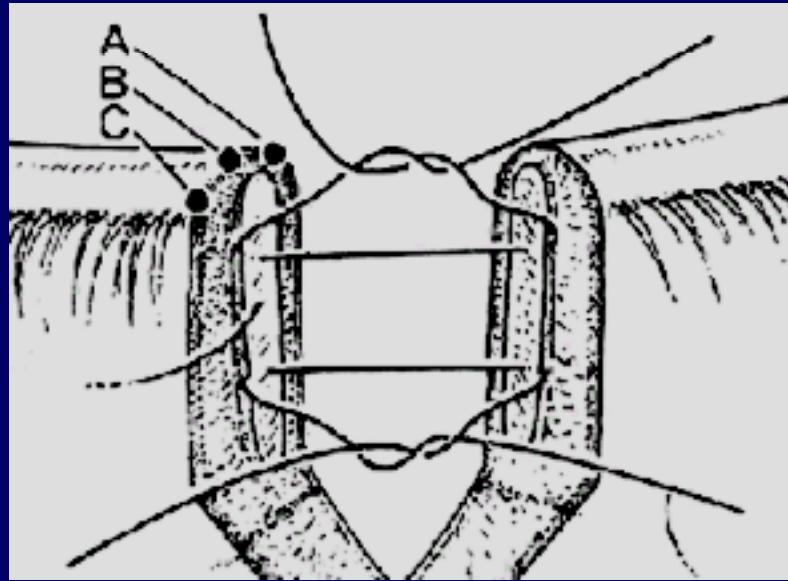
- 🕒 Can result from sharp or blunt trauma
- 🕒 Rule out associated ocular injury
- 🕒 Avoid lid margin retraction
- 🕒 Remove superficial foreign bodies
- 🕒 Rule out deeper foreign bodies
- 🕒 Give tetanus prophylaxis

Lid laceration

- ☛ refer to ophthalmologist if associated ocular injury
 - ☛ ruptured globe
 - ☛ lacrimal drainage system
 - ☛ levator aponeurosis, SR
 - ☛ medial canthal tendon
 - ☛ extensive tissue loss (>1/3)
 - ☛ FB

Lid laceration

- ⦿ delayed repaired in
- ⦿ significant risk for contamination
- ⦿ human bites
 - ⦿ clean with betadine
 - ⦿ irrigate with saline
 - ⦿ search FB
 - ⦿ debride infected or necrotic tissue
 - ⦿ leave the wound open & topical antibiotic
 - ⦿ 3-4 d later : repair
 - ⦿ systemic antibiotic



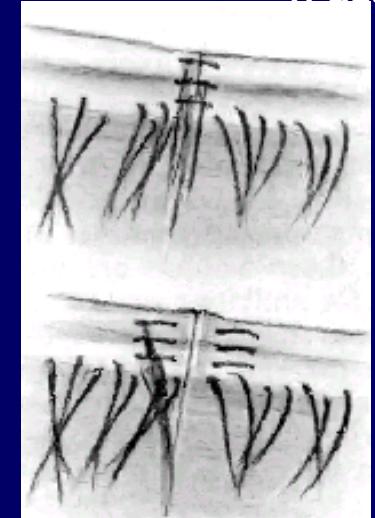
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Lid laceration

- 🕒 repaired in ER
 - 🕒 laceration involve lid margin
 - 🕒 suture #1 5-0 silk : gray line
 - 🕒 suture #2 6-0 silk : post & parallel #1
 - 🕒 suture #3 6-0 silk : ant & parallel #1
 - 🕒 antibiotic EO bid
 - 🕒 cloxacillin/cephalexine
 - 🕒 eyelid margin sutures (10-14d)
 - 🕒 other suture (4-6 d)



Subconjunctival hemorrhage

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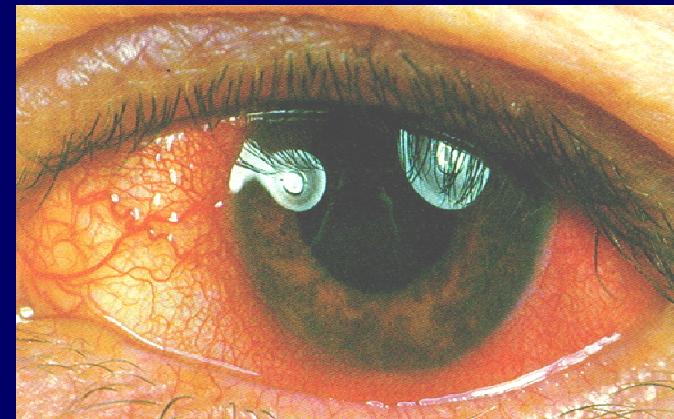
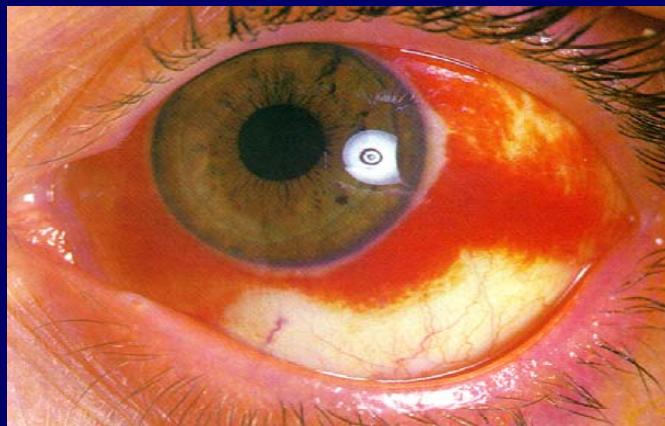
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Subconjunctival hemorrhage

- ⦿ **Symptoms:** Red eye , may have mild irritation
- ⦿ **Sign:** blood underneath conj.Following trauma
- ⦿ **Etiology :** trauma, valsalva(coughing), HT
bleeding disorder, idiopathic
- ⦿ **DDx :** Kaposi's sarcoma, lymphoma

Nontraumatic red eye

possible causes

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

Subconjunctival hemorrhage

- 🕒 Work-up:
 - 🕒 history - bleeding problem, eye rubbing , trauma, heavy lifting(valsalva), URI
 - 🕒 ocular exam. - R/O ruptured globe, conj. lesion
 - 🕒 BP check
 - 🕒 PT, PTT ,CBC in recurrent subconj.hemorrhage

Subconjunctival hemorrhage

- ⦿ Treatment

- ⦿ none required

- ⦿ artificial tear drops qid

- ⦿ FU 2-3 weeks if blood doses not resolve or recurrent

Corneal abrasion

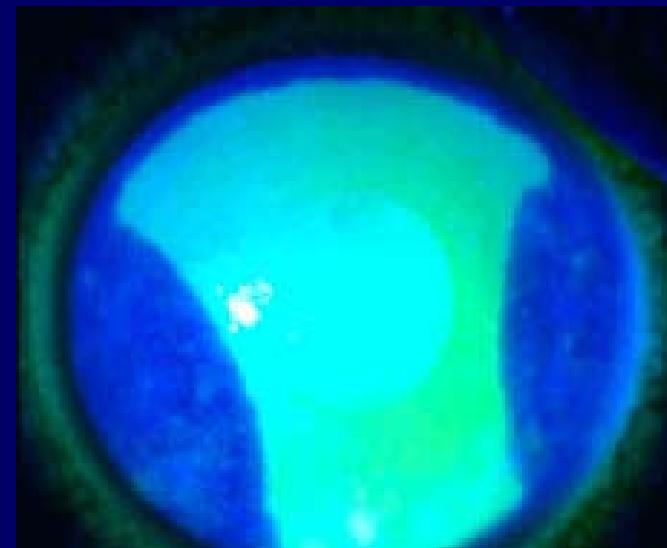
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Corneal abrasion

- ☞ **Abrasio** : absence of epithelium that is caused by trauma.
- ☞ **Hx** : of scratching the eye
- ☞ **Symptoms**: Pain , photophobia , FB sensation, tearing
- ☞ **Sign** : epithelial staining defect with fluorescein, conjunctival injection, swollen eyelid

Corneal abrasion

☞ Work-up

use fluorescein

measure the size of the abrasion
diagram its location

evert eyelid : search foreign body

Corneal abrasion

☞ Treatment

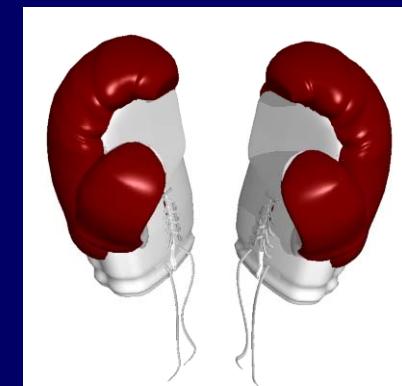
- ☞ cycloplegic ED
- ☞ antibiotic EO
- ☞ pressure patch for 24 hr
not applied PP at significant
risk for infection

Corneal abrasion

☞ FU daily

- ☞ **abrasion** เล็กลง antibiotic ED q 1-2 hr
ไม่ path ให้ antibiotic EO hs
- ☞ **abrasion** ใหญ่: antibiotic EO+ PP 24 hr.
- ☞ observe infection ทุกวันจนกว่าจะหาย
- ☞ return if symptoms persist or worse
- ☞ white corneal infiltration refer
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Traumatic hyphema

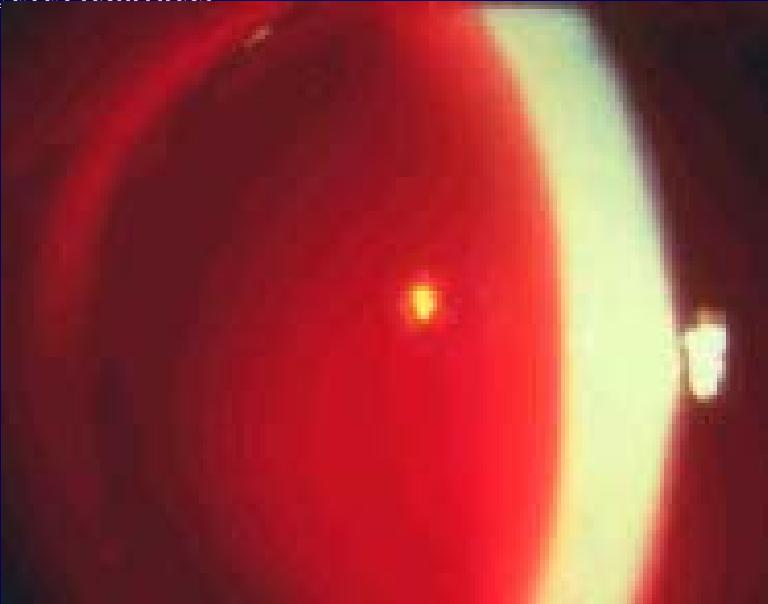


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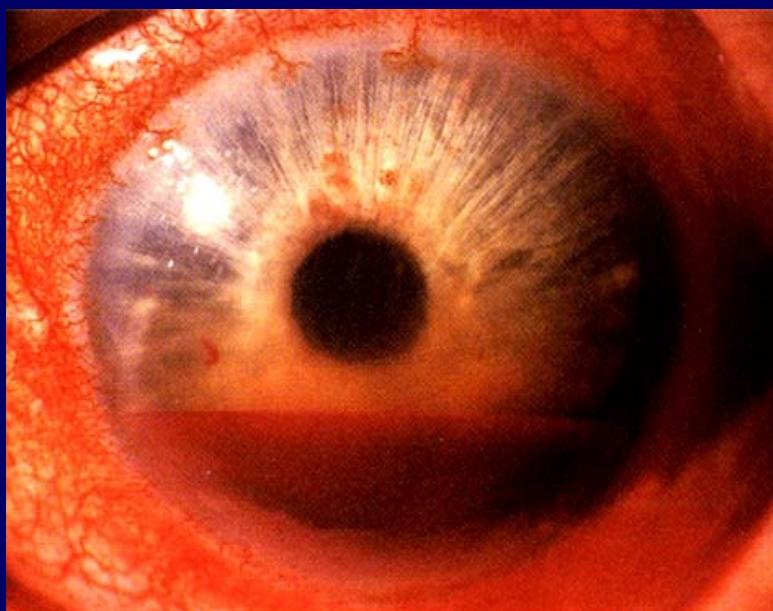
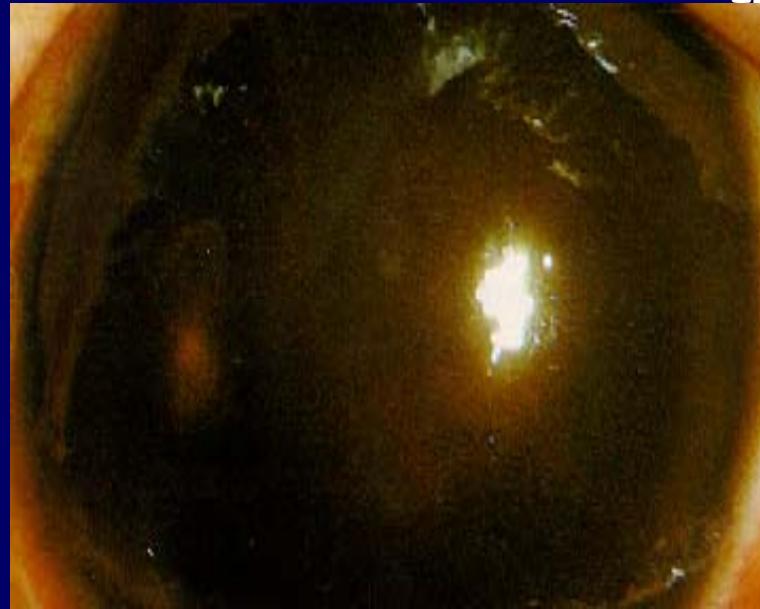
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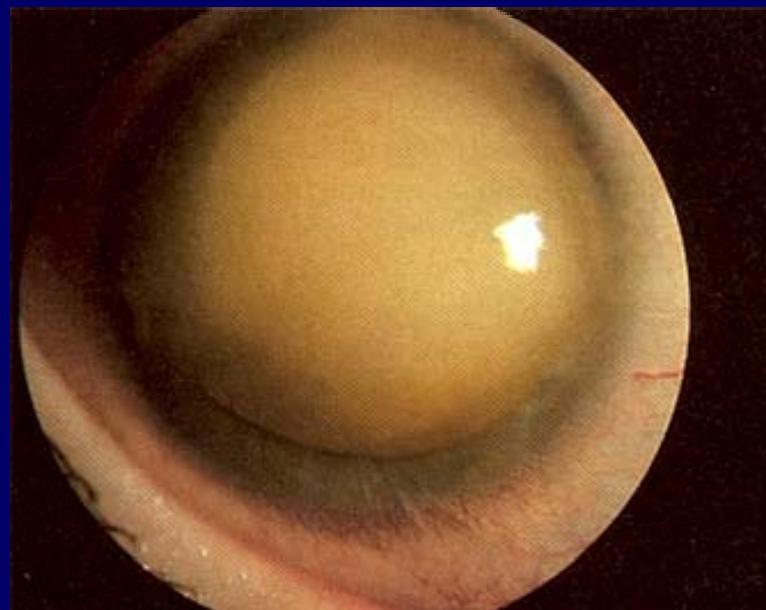
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Traumatic hyphema

Hyphema : เลือดออกใน AC จาก blunt trauma

Complication : glaucoma

blood stain ที่ cornea

Symptoms : Pain, Blurred vision

history of trauma

Sign : Blood in the AC

Work-up : type of injury, time,

R/O ruptured globe

VA , IOP, level of hyphema

Fundus ถ้าทำได้ , U/S R/O RD

Traumatic hyphema

Management

admit 7 day : (absolute) bed rest

นอนหัวสูง 30

shield (ไม้)ปิด patch

analgesics (not ASA)

sedative drug

antiglaucoma : IOP > 30 mmHg

1% atropine drops 3-4 x /day

aminocaproic acid

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Traumatic hyphema

Management

antiglaucoma :

IOP > 30 mmHg

0.5 % beta-blocker bid / +

metazolamide 50mg po tid /+

iv mannitol 1-2gm/kg over 45 min

aminocaproic acid (50 mg/kg) po q 4 hr
(< 30 gm/d)

Traumatic hyphema

ถ้า admit ไม่ได้ : ให้กลับมาทันที ที่ป่วยตามมัวลง

IPD FU observe rebleeding

IOP

corneal blood staining

paracentesis and irrigation

OPD FU 2 wk - IOP and refer to oph.

4 wk - gonioscopy , fundus exam.

yearly - angle-recession glaucoma

Hyphema management

- ☺ R/O globe is ruptured
- ☺ Shield eye
- ☺ Restricted activity
- ☺ symptomatic Rx
- ☺ Topical cycloplegic & corticosteroids
- ☺ Possibly aminocaproic acid
- ☺ refer to ophthalmologist

Ocular foreign body

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Conjunctival foreign body



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Conjunctival foreign body

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Symptoms : Ocular irritation or pain

FB sensation

tearing , red eye

Hx: trauma or FB to the eye.

Signs : Linear,vertical scratches

(FB- upper eyelid)

subconj.hemorrhage

Dx tests: fluorescein - scratch

Conjunctival foreign body

Management

topical anesthesia

irrigation

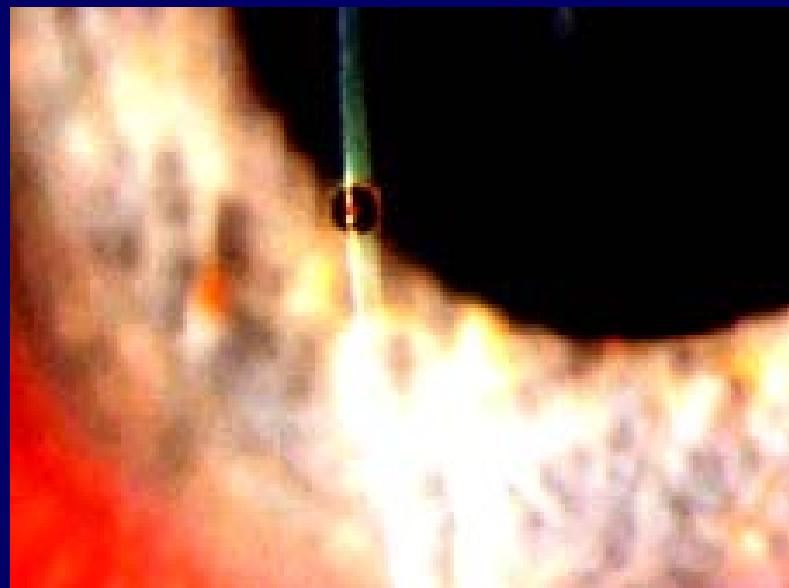
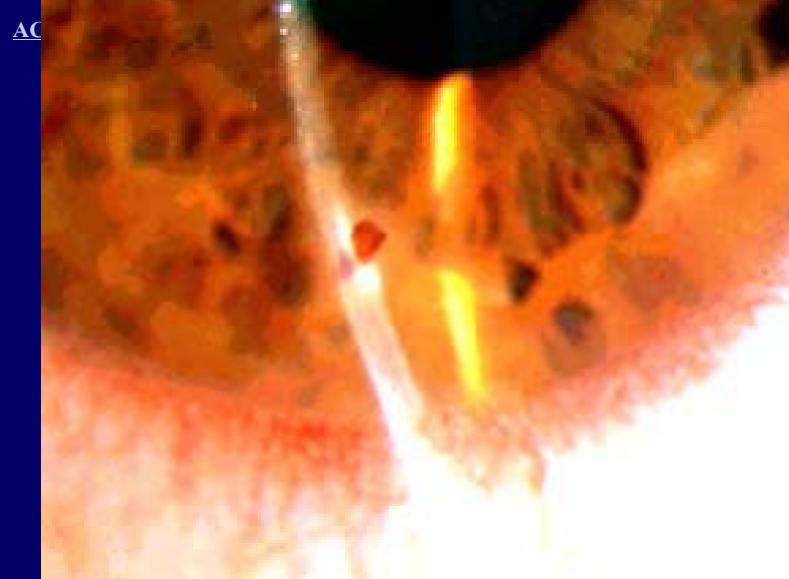
cotton-tipped applicator

fine forceps

artificial tear

antibiotic EO : PEE , abrasion

FU วันรุ่งขึ้นในรายที่มี residual FB



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Corneal foreign body

Hx : FB เข้าตา

Symptoms : FB sensation, tearing

blurred vision, photophobia

Sign: Corneal FB, Rust ring or both

Dx: cornea , conjunctiva
evert eyelids

X-ray: orbit AP, Lat. ມອງຂຶ້ນ , ມອງລົງ

R/O IOFB

Corneal foreign body

Management

Remove FB

ยาชา หลับกับ antibiotic q 5 min x 6

irrigate

เข็ม # 25 remove FB (แกร์นขยาย)
เขี่ยออกจาก dome ของ cornea

Remove rust ring

วัดขนาดของ epithelial defect : FU
antibiotic ED q 1-2 hr or
antibiotic EO + PP

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Corneal foreign body

FU lesion < 1-2 mm ก , clean, non-central

ไม่ปิด patch ต่อ

topical antibiotic อีก 3-4 วัน

Poly-oph / sulfacetamide ED qid

Chloram./ erythro.EO 2-3x/day FU

lesion ใหญ่, central, mucopurulent discharge

infiltrate, rust ring FU ใน 24 hr.

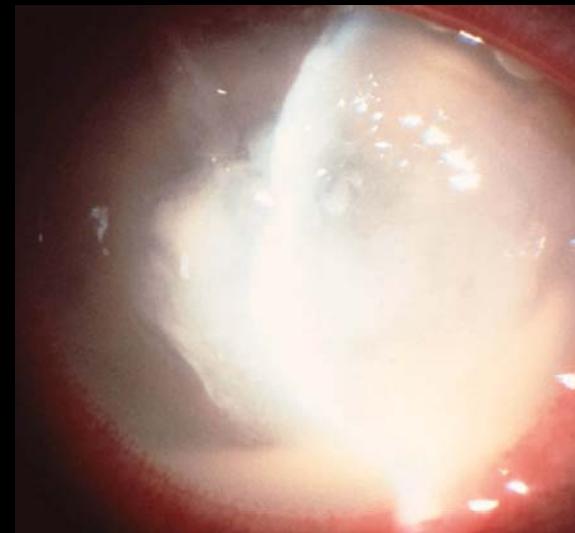
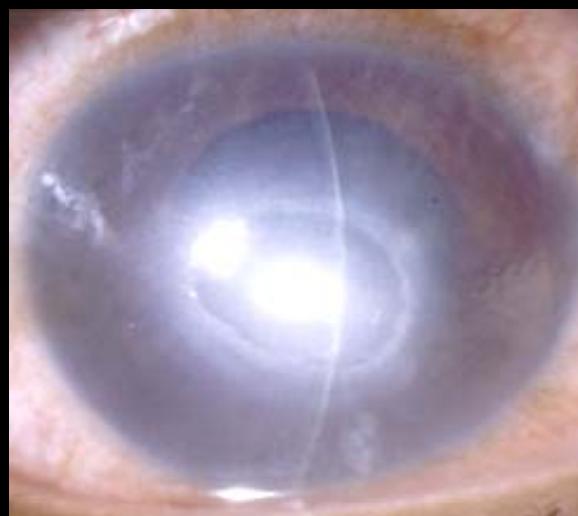
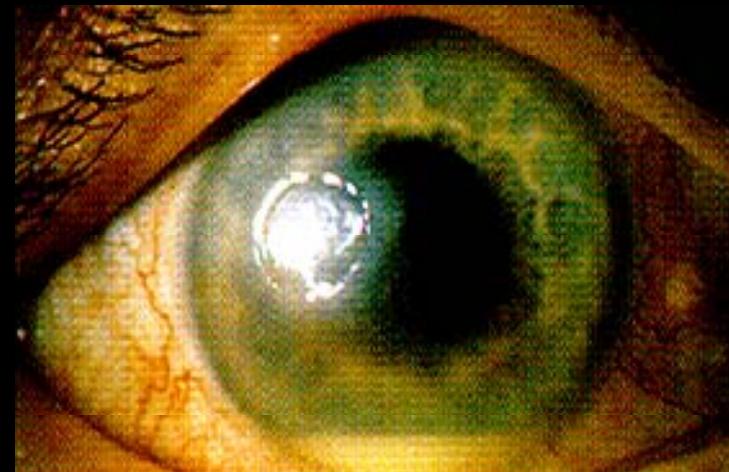
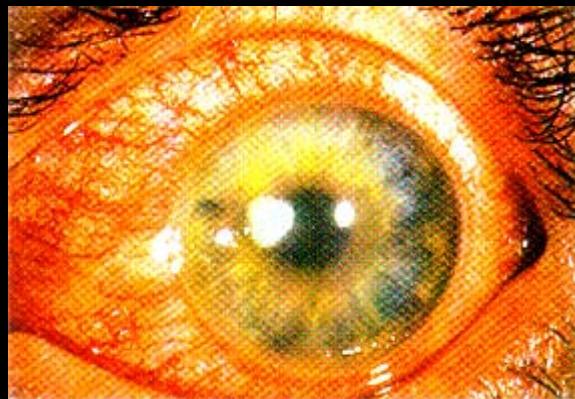
ถ้า มี extreme redness and pain

C/S และให้ antibiotic more aggressively

ที่สำคัญควรปรึกษา กับ จักษุแพทย์ ด้วย

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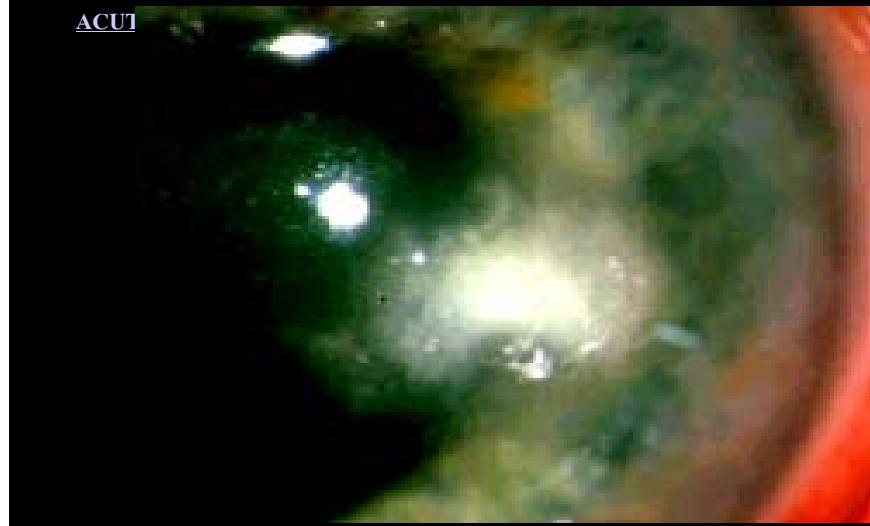


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Intraorbital foreign body

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Intraorbital foreign body

⌚ Symptoms

- ⌚ asymptomatic
- ⌚ decreased VA
- ⌚ pain
- ⌚ eyelid swelling
- ⌚ double vision
- ⌚ history of trauma



Intraorbital foreign body

⌚ Critical Signs

- 👉 FB : X-ray, CT scan, U/S



⌚ Other Signs

- 👉 palpable orbital mass
- 👉 limit EOM
- 👉 proptosis
- 👉 swollen



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erythematous lid

Intraorbital foreign body

😢 FB

- 👉 poorly tolerated: wood, vegetable
- 👉 fairly well tolerated: copper alloys
- 👉 well tolerated: stone, glass, plastic
iron, lead, steal, aluminum, metals

Intraorbital foreign body

⌚ Work-up

- 👉 history : FB ?, time
- 👉 complete exam.: RAPD , IOP , Fundus
- 👉 CT scan: R/O ruptured globe

location of FB

Intraorbital foreign body

- ⌚ Indication : exploration & extraction
 - 👉 signs of infection
 - 👉 fistula formation
 - 👉 signs of optic nerve compression
 - 👉 severe inflammation
 - 👉 large/sharp FB & easily extracted

Intraorbital foreign body

治疗

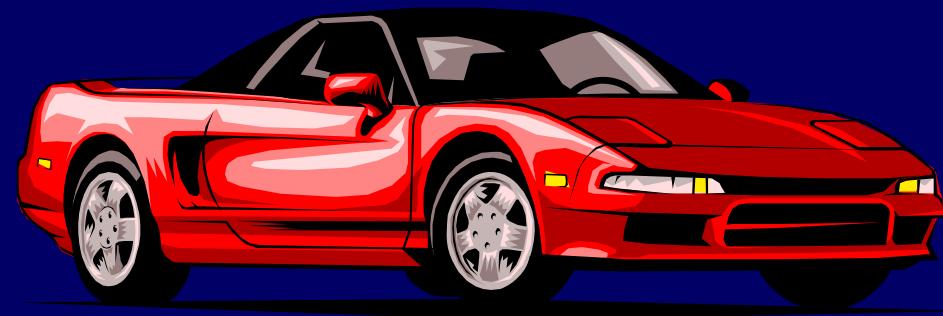
- 👉 hospitalization
- 👉 systemic antibiotics
- 👉 tetanus toxoid
- 👉 surgery when indicated

Follow-up

- 👉 VA , RAPD , IOP, EOM , proptosis
- 👉 oral antibiotic 10-14 d

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Ruptured globe & Penetrating injury



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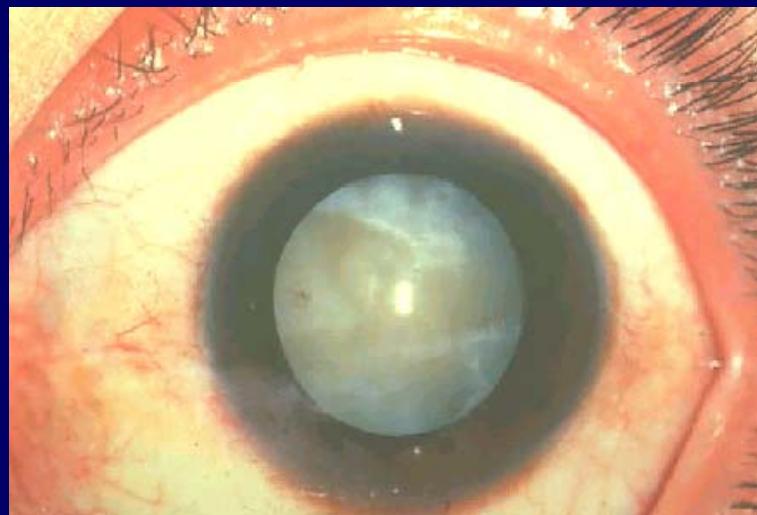


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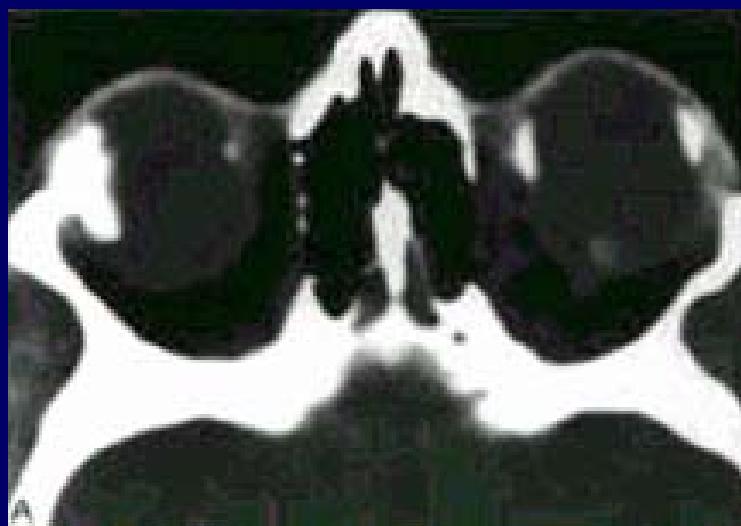
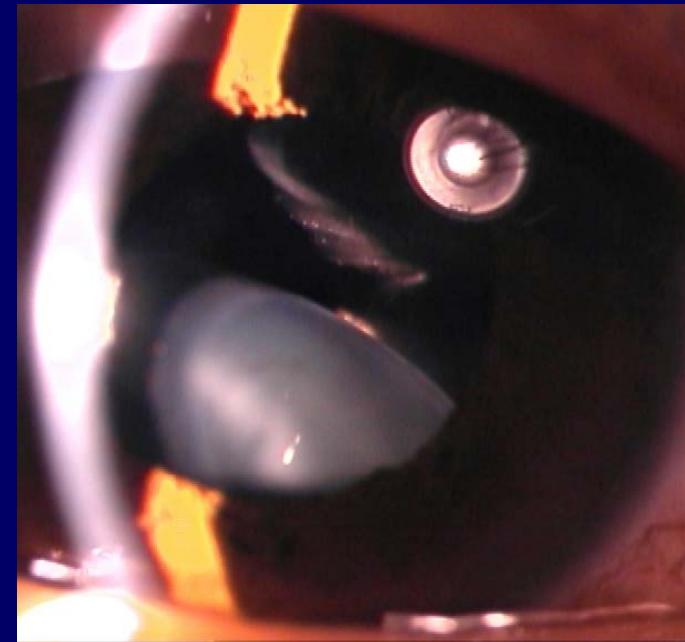
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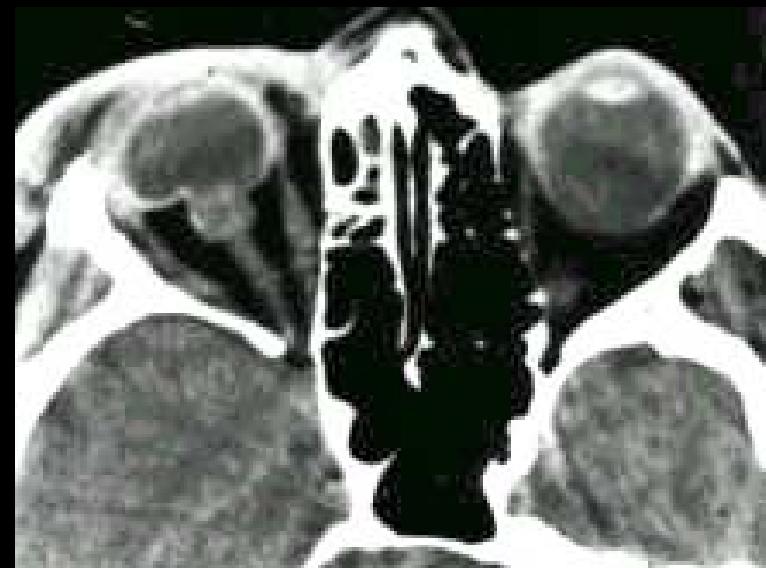
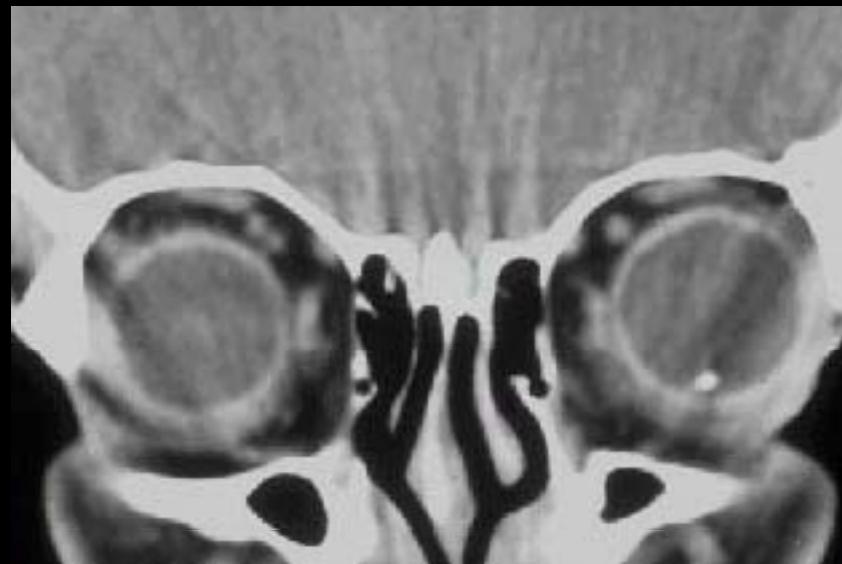
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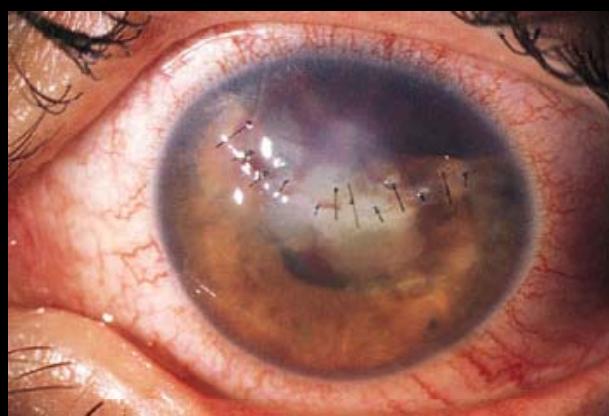
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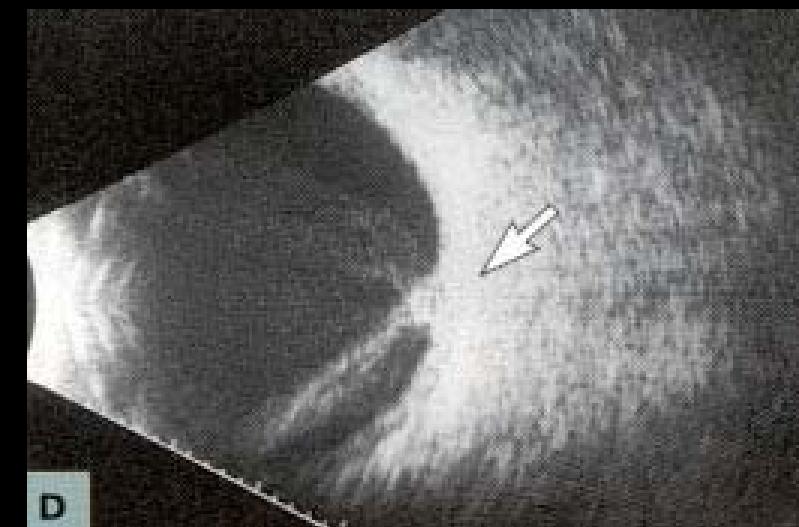
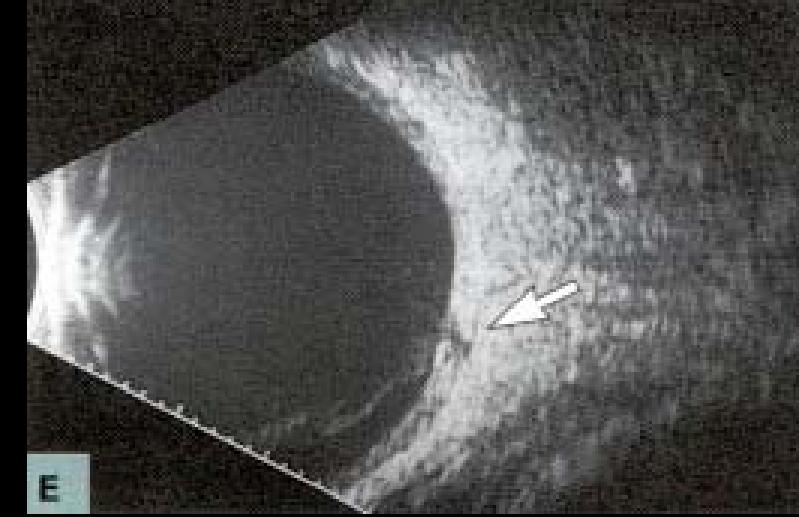
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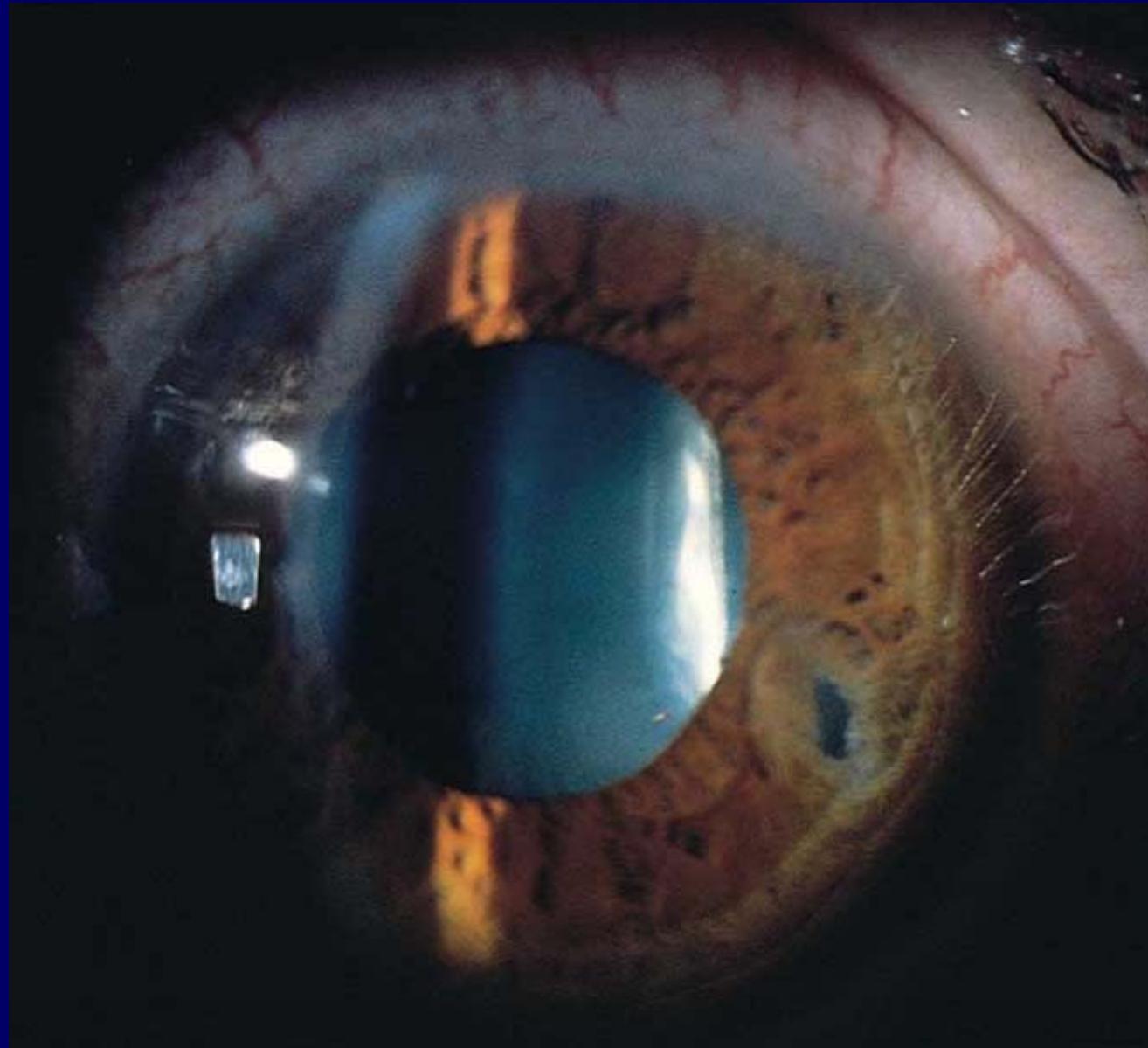
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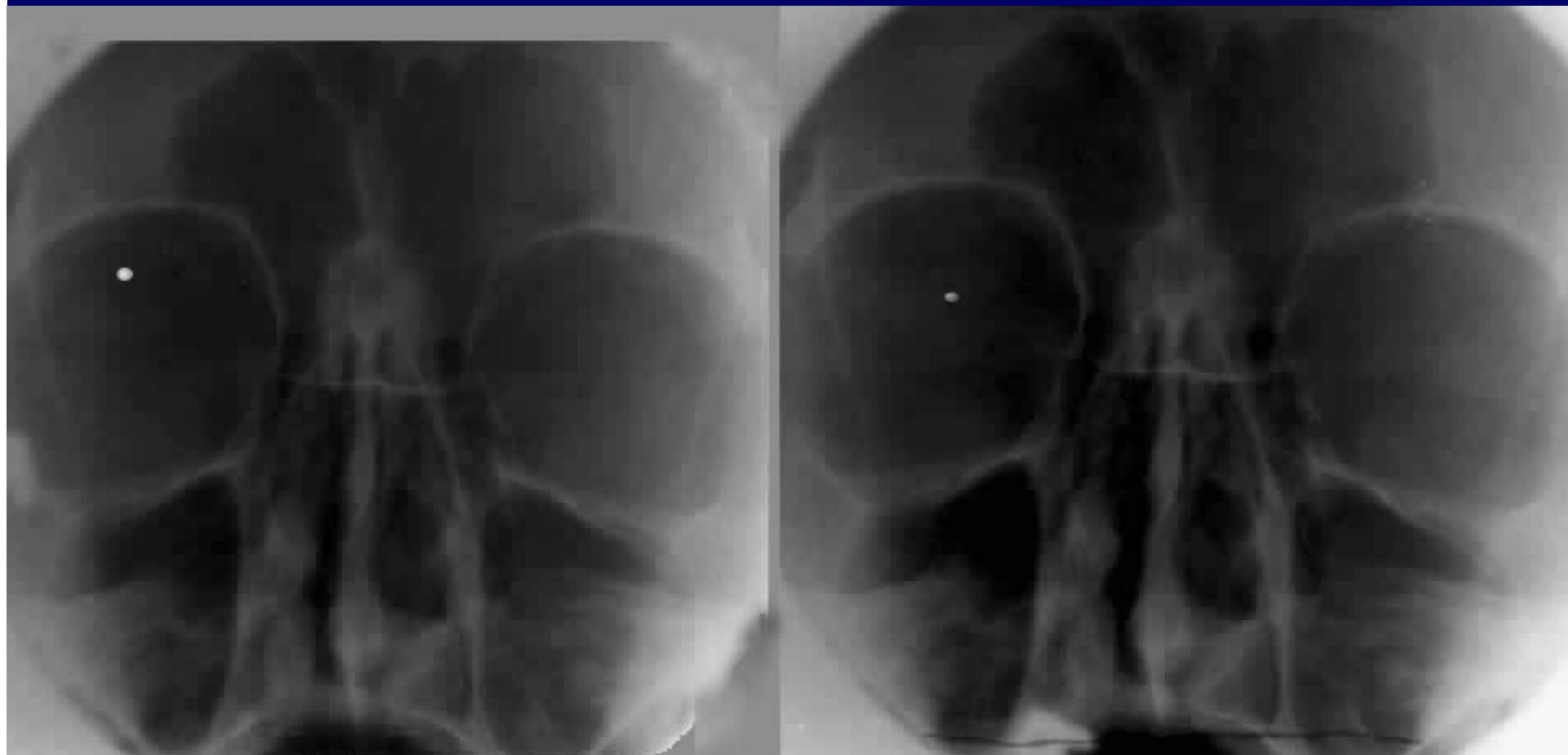
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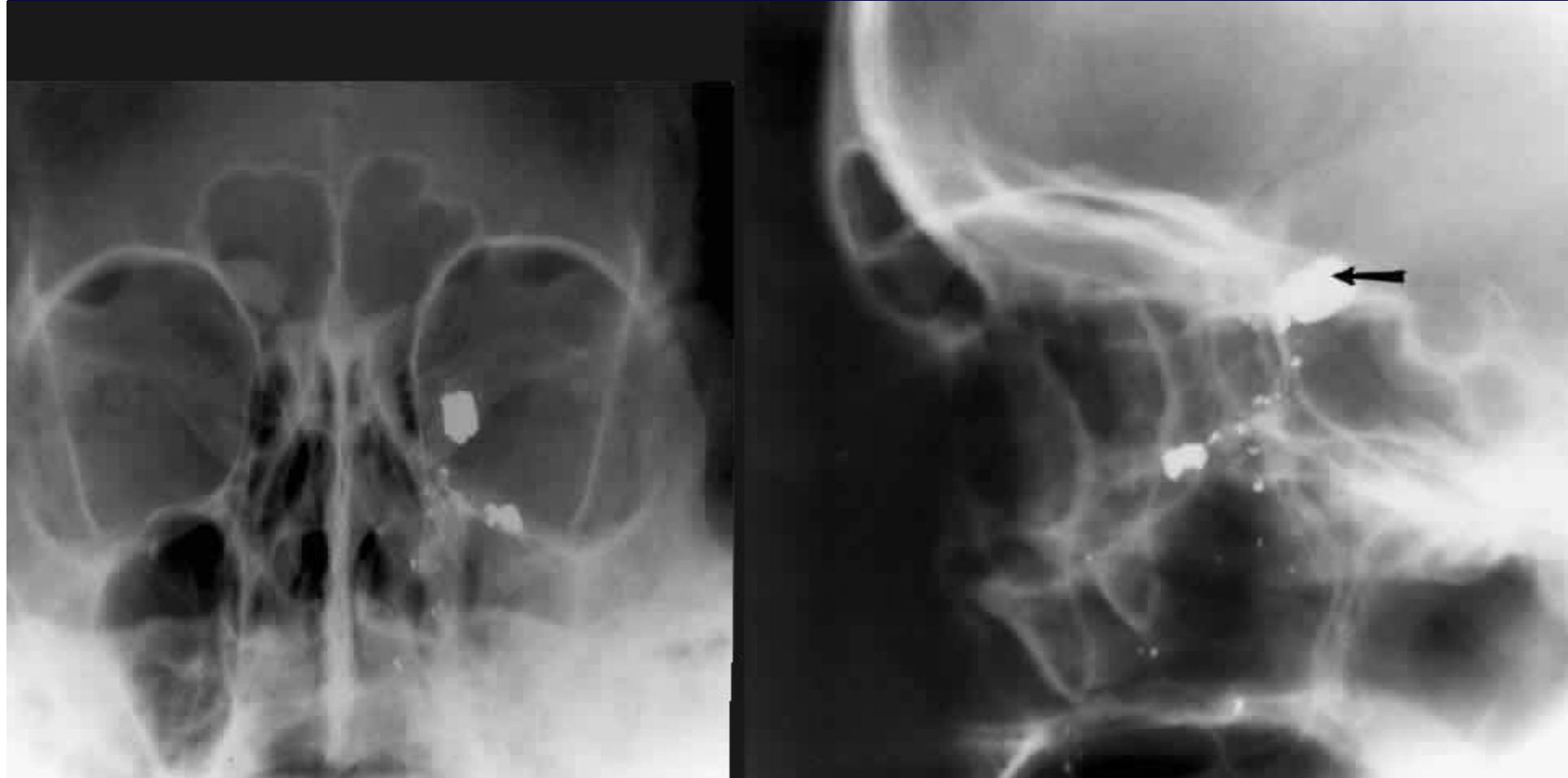


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Ruptured globe & Penetrating injury

😊 Symptoms : pain , decreased vision,

history of trauma

😊 Signs: Ruptured globe

- 👉 hypotony (not always present)
- 👉 severe subconj. edema & hemorrhage
- 👉 intraocular contents may be outside the globe
- 👉 limitation of extraocular motility

Ruptured globe & Penetrating injury

☺ Penetrating injury

- ☞ full thickness scleral and corneal laceration
- ☞ sign of ruptured globe
- ☞ history of sharp object entering the globe

☺ Other Signs

- ☞ irregular pupil , iridodialysis
- ☞ periorbital echymosis, subluxed lens

Ruptured globe & Penetrating injury



Diagnostic test

☞ film orbit AP & Lateral : R/O IOFB

☞ CT scanning may be helpful.

show a shrunken globe.

shows subconjunctival edema.

R/O IOFB

If globe rupture is suspected

- ☺ Stop examination
- ☺ Shield the eye (do not patch)
- ☺ Give tetanus toxoid prophylaxis
- ☺ NPO and systemic antibiotic
- ☺ Refer immediately to ophthalmologist



Orbital Blow-out fracture

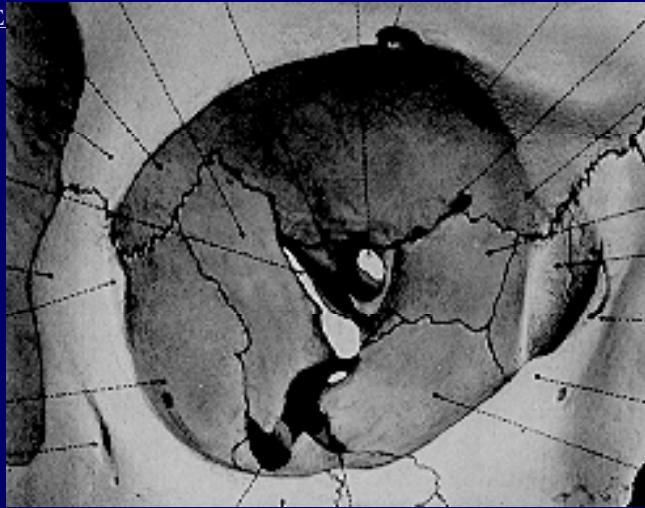


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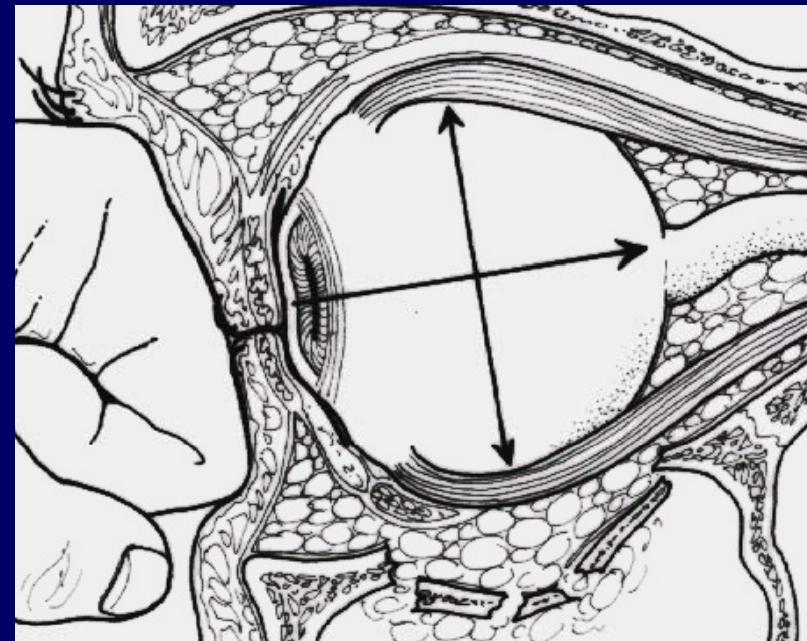
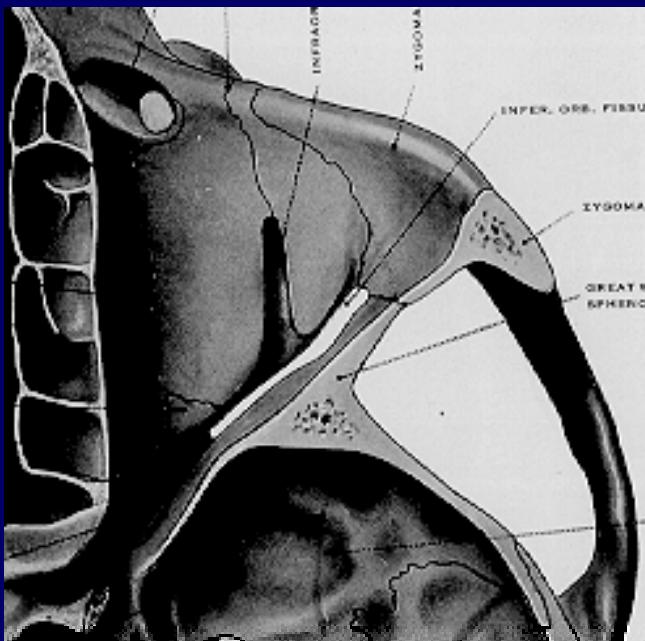
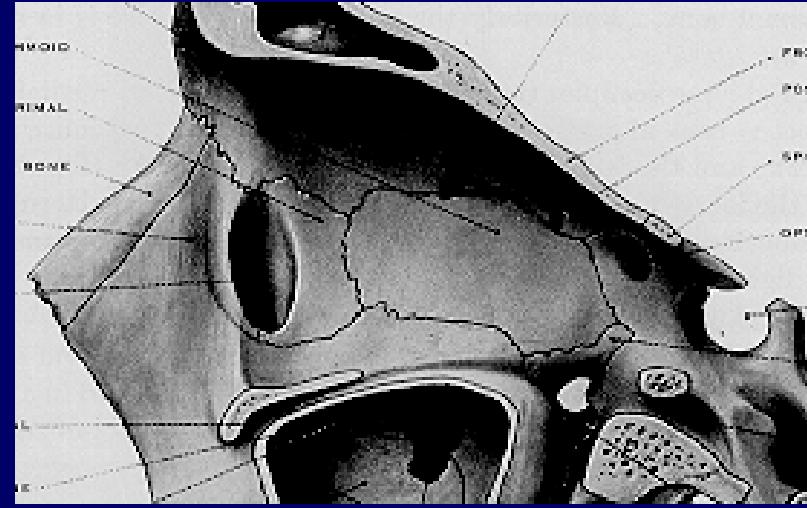
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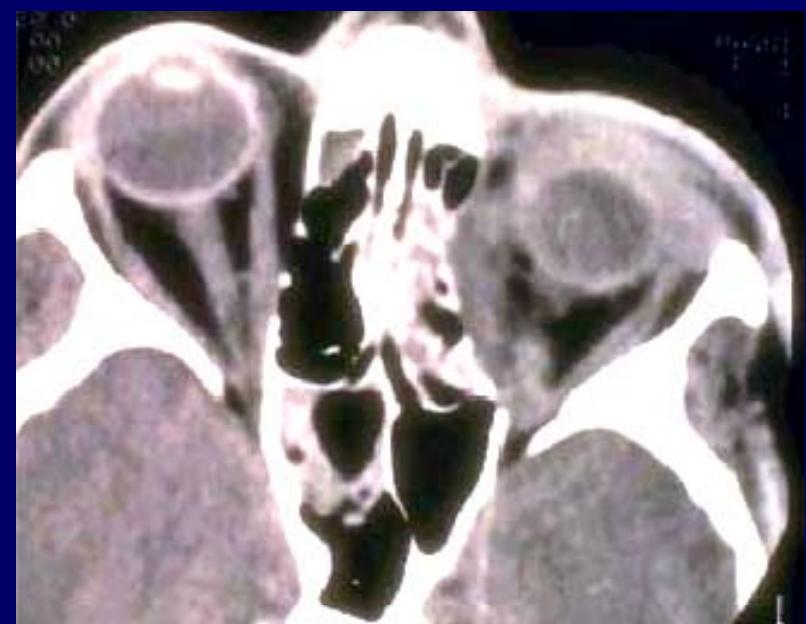
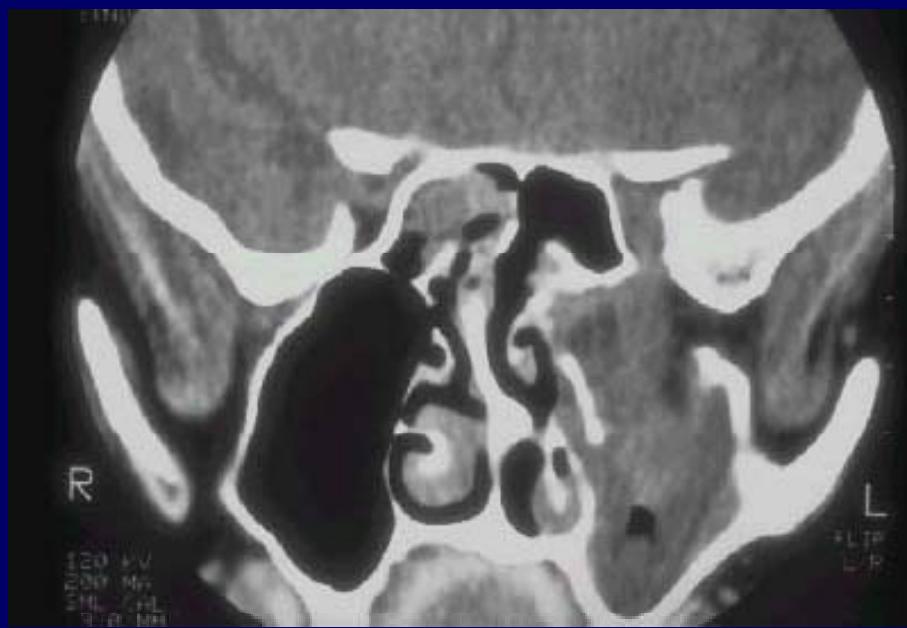
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Orbital Blow-out fracture

😊 Symptom

- 👉 Pain (vertical eye movement)
- 👉 local tenderness
- 👉 binocular double vision
- 👉 eyelid swelling after nose blowing
- 👉 recent history of trauma.

Orbital Blow-out fracture

☺ Signs

- ☞ restricted eye movement (upward/lateral gaze)
- ☞ orbital subcutaneous emphysema
- ☞ hypesthesia (intraorbital nerve)
- ☞ enophthalmos (masked by orbital edema).

☺ Other Signs

- ☞ nosebleed, lid edema, ecchymosis, ptosis

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Orbital Blow-out fracture

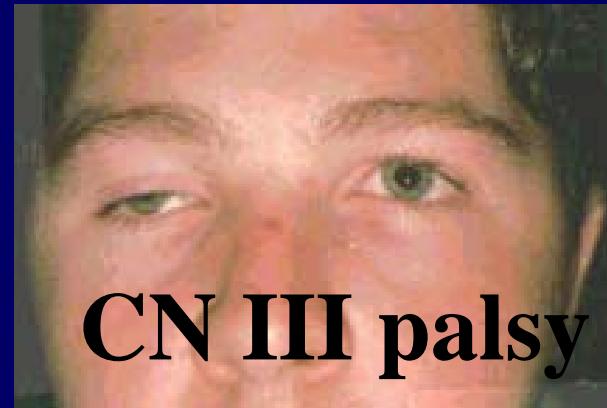
☺ Differential Diagnosis

- ☞ Orbital edema and hemorrhage
(limitation of EOM, but resolve > 7-10 d.)
- ☞ Cranial nerve palsy
(limitation of EOM, no restriction on forced duction testing.)

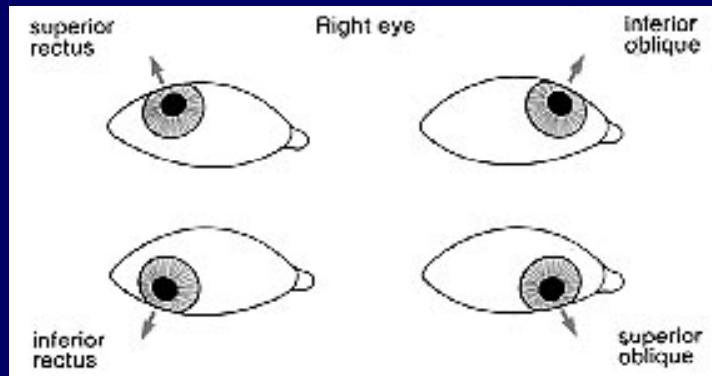
Retrobulbar Hemorrhage



trauma



CN III palsy



CN VI palsy



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Orbital Blow-out fracture

😊 Work-up

👉 Complete eye exam.

EOM and globe displacement

Compare the sensation of both cheek

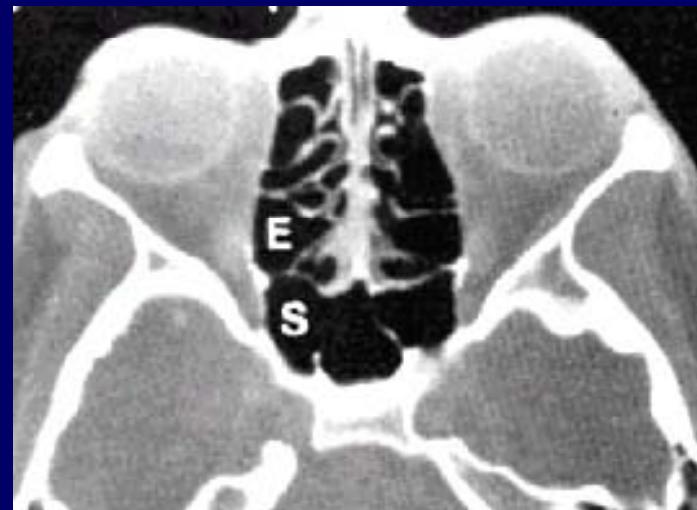
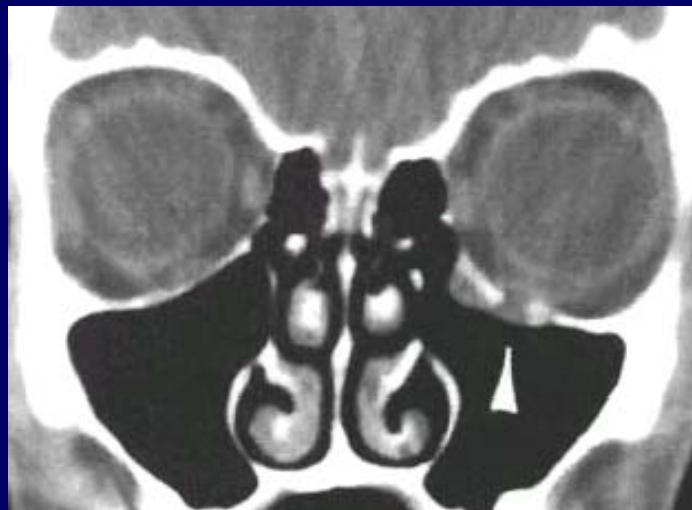
palpate eyelids for crepitus

evaluate for hyphema, retinal edema

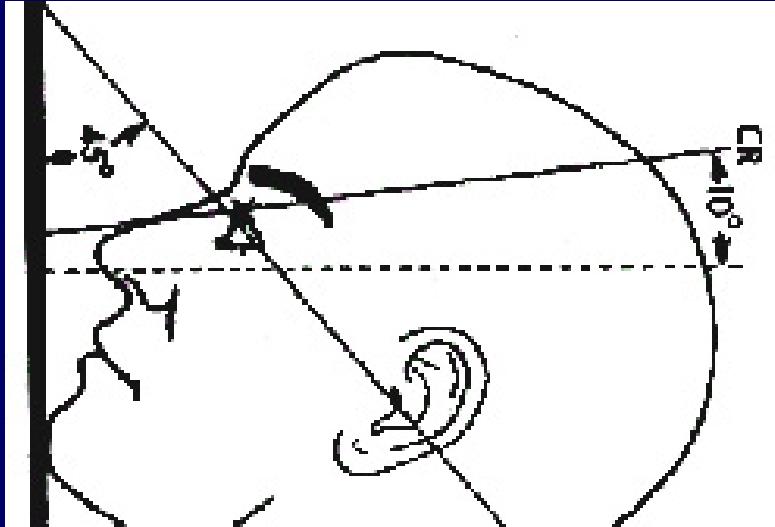
intraocular pressure (IOP)

👉 Forced duction testing (beyond one week)

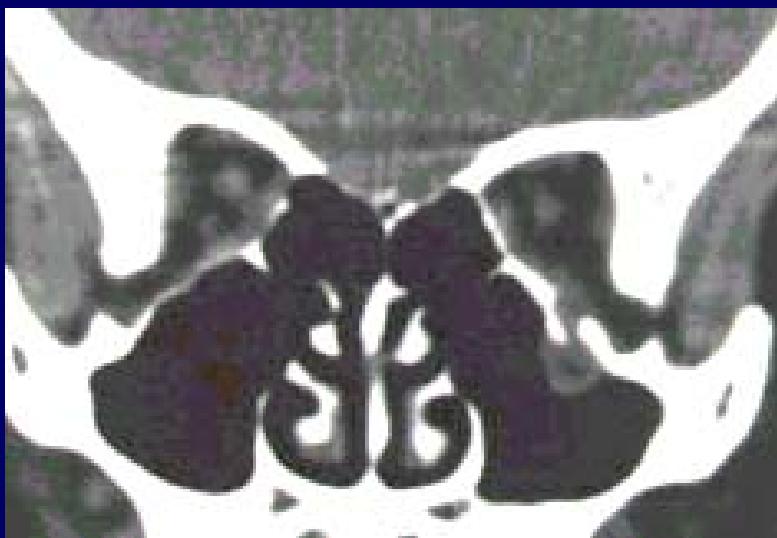
👉 CT scan of orbits & brain



ACUTE EYE CONDITIONS



trauma



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Orbital Blow-out fracture

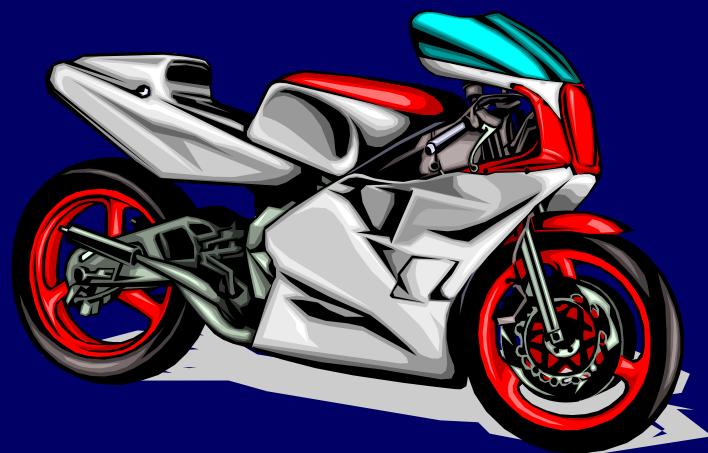
☺ Treatment 10-14 d

- ☞ Nasal decongestants(Afrin nasal spray bid)
- ☞ Broad-spectrum oral antibiotics:
cephalexin 250-500 mg po qid or
erythromycin 250-500 mg po qid
- ☞ Instruct the patient not to blow his nose.
- ☞ Ice packs to the orbit for the first 24-48hr.
- ☞ Re-examination at 10-14 d after trauma

Orbital Blow-out fracture

- ☺ **Surgical indications (controversy)**
 - ☞ persist entrapment of orbital contents
 - ☞ diplopia within 30 degrees of primary position
 - ☞ positive forced duction test & X-ray :entrapment
 - ☞ cosmetically unacceptable enophthalmos
 - ☞ fractures (1/2 of orbital floor ,large medial wall fibrosis & contracture of prolapsed tissue

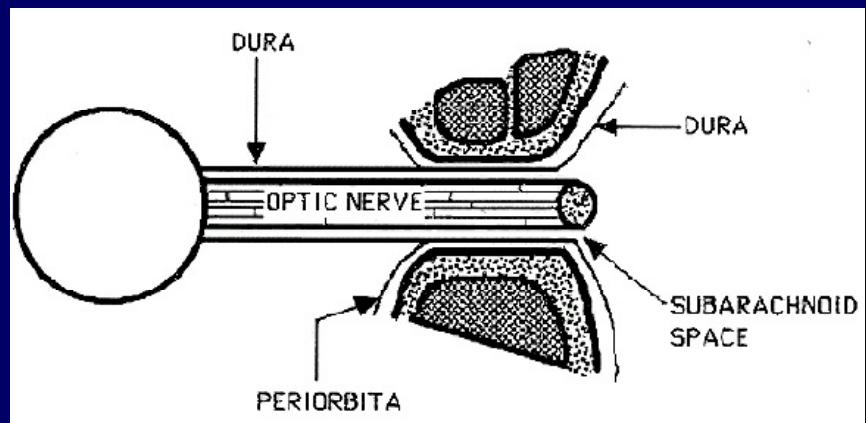
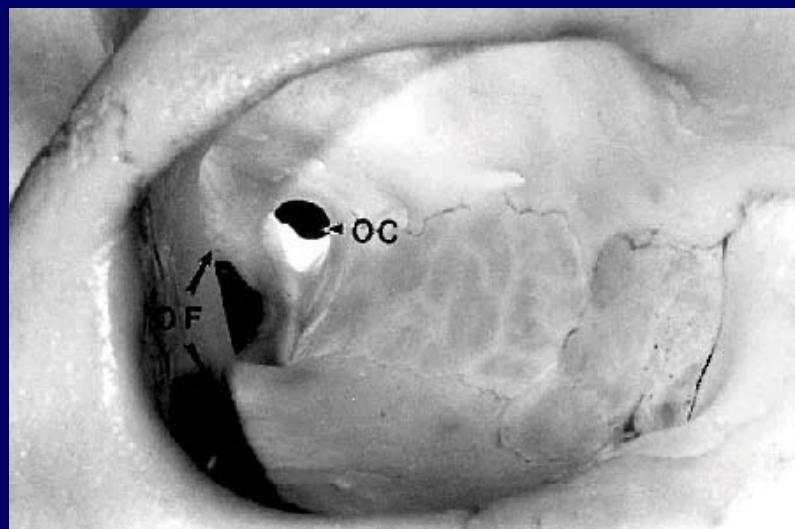
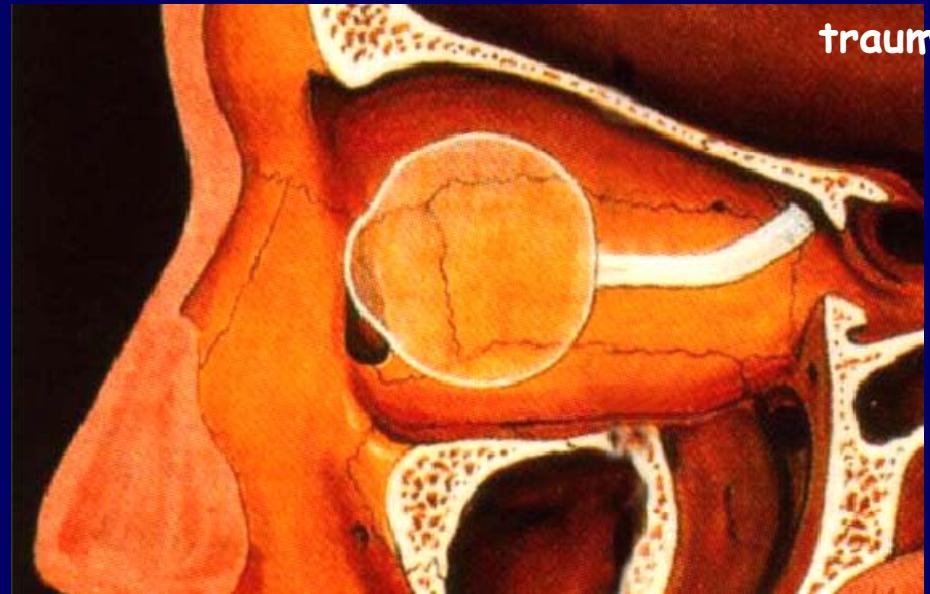
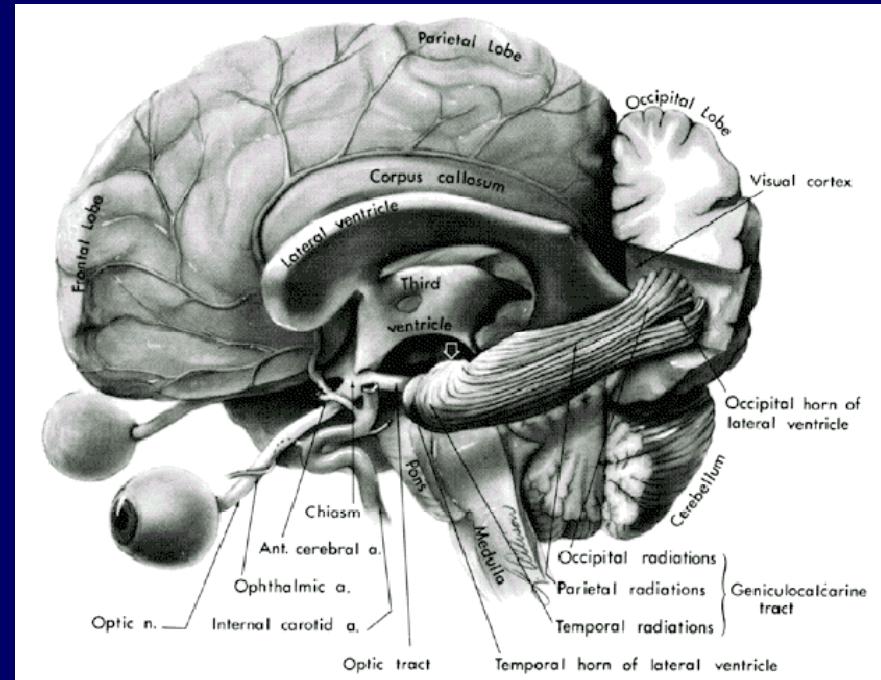
Traumatic Optic Neuropathy



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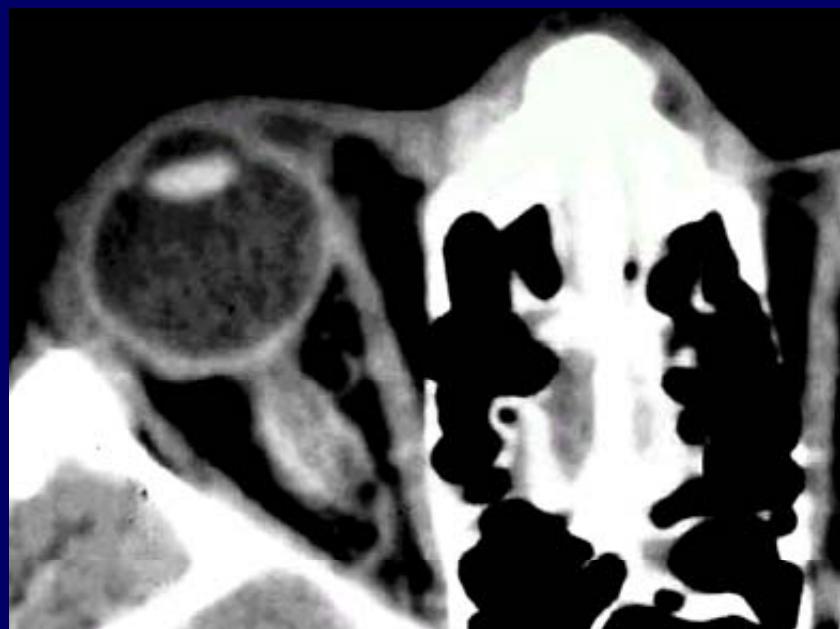
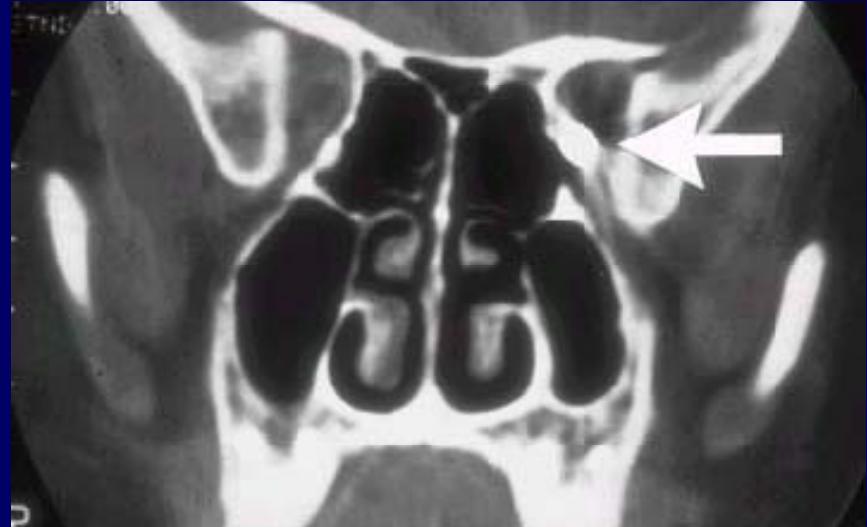
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ACUTE EYE CONDITIONS



trauma

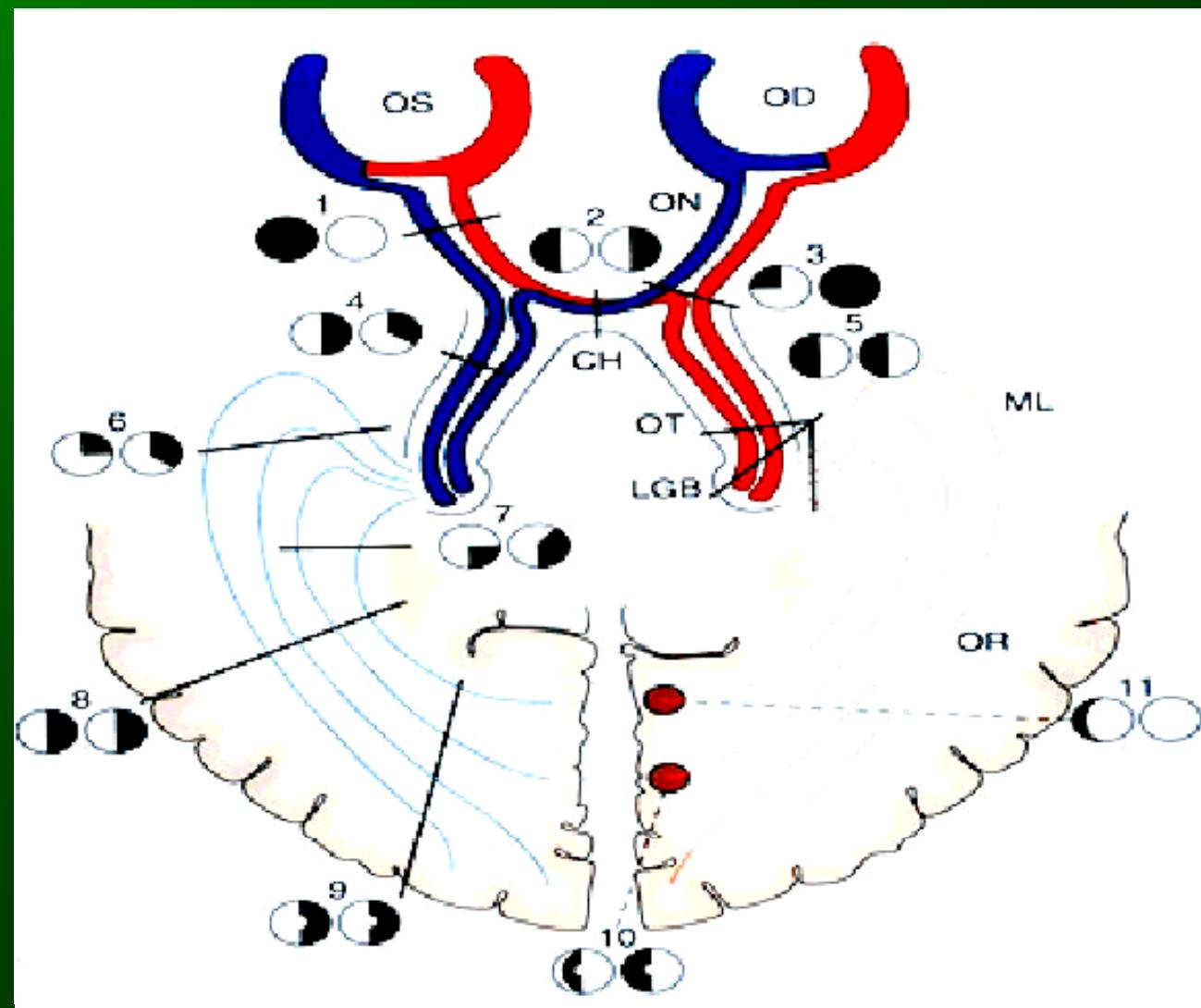


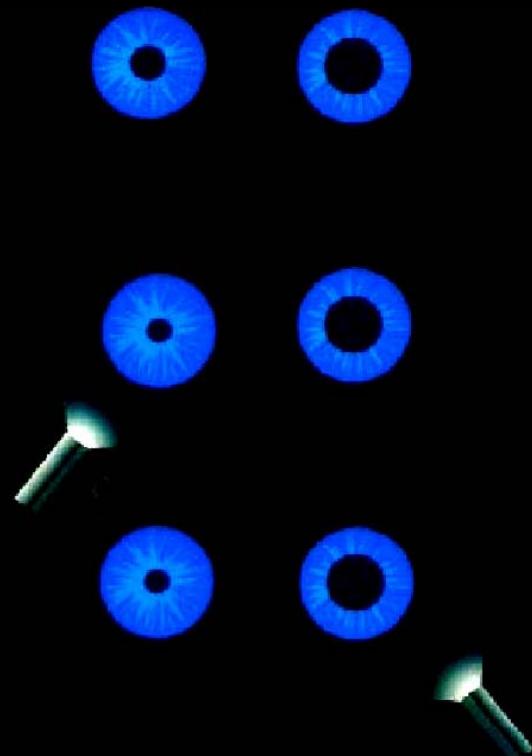
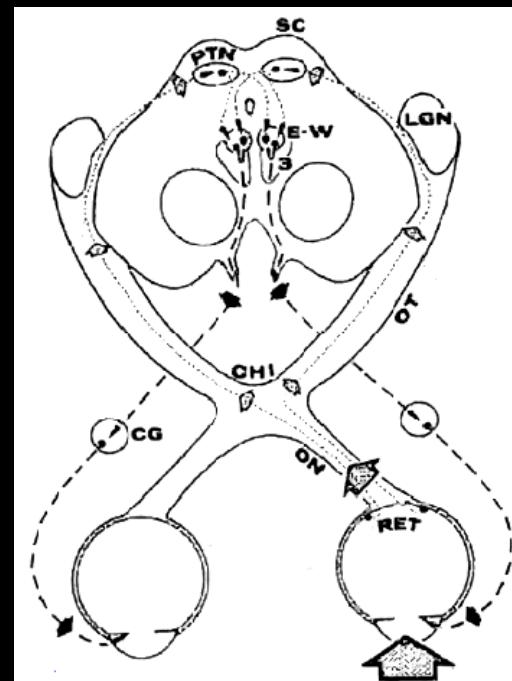
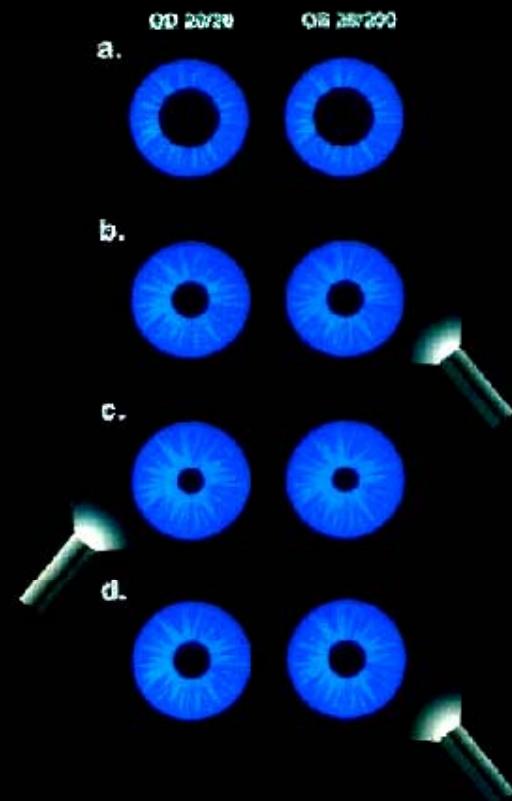
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Traumatic Optic Neuropathy

- ☺ Symptoms :  VA after trauma
- ☺ Critical Signs: new RAPD +
- ☺ Others Signs: relatively poor color vision VF defect

Traumatic Optic Neuropathy

☺ Etiology :

- ☞ shearing injury : blunt trauma
- ☞ compression : bone,
hemorrhage
perineural edema
- ☞ laceration : bone, IOFB

Traumatic Optic Neuropathy

☺ Differential Diagnosis:

☞ severe retinal trauma

☞ vitreous hemorrhage

☞ intracranial trauma

with optic chiasm damage

Traumatic Optic Neuropathy

😊 Work-up :

- ~~~~~ complete eye exam.
 - 👉 R/O ruptured globe
 - 👉 pupillary evaluation
- ~~~~~ VF : confrontation
- ~~~~~ color vision test (each eye)
- ~~~~~ CT : head , orbit

Traumatic Optic Neuropathy

☺ Treatment :

- ☞ admit in acute cases
- ☞ iv antibiotics : sinus wall fracture
 - 👉 genta. + cefazolin or clinda.
- ☞ iv steroid : methylprednisolone
 - 👉 250 mg iv q 6 hr
 - 👉 1 gm iv OD

Traumatic Optic Neuropathy

☺ FU :

- ☞ daily
- ☞ evaluate VA if ↓ refer
- ☞ pupillary reactions
- ☞ color vision