Ocular trauma
ACUTE EYE CONDITIONS

PRESENTING SYMPTOM

EMERGENCY

Sudden
- loss of vision
- onset of pain

TRAUMA

Evaluation needed:

Immediately

VERY URGENT

Trauma
- blurring of vision

“Something in the eye”

URGENT

Acute redness of the eye
Suddenly unequal pupil

Within a few hours

Within one day
ACUTE EYE CONDITIONS

anatomy
Ocular Trauma

- Laceration, ptosis
- VH retina edema, RD
- Subconj. hemorrhage
- Abrasion, perforation
- Hyphema
- Mydriasis, RAPD +
- Blow out fracture
- Sublux., dislocate, cataract

Trauma

Optic neuropathy

Acute Eye Conditions
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
ACUTE EYE CONDITIONS

VA chart

< 20/400 \[\text{blindness}\] / \[VF< 10^0\]
20/200
20/100
20/80 \[\text{low vision}\] / \[30^0< VF< 10^0\]
20/60
20/50
20/40
20/30
20/25 \[\text{normal vision}\]
20/20
20/15

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Final visual outcome depends on prompt, appropriate diagnosis and treatment.
Lid laceration

[Images of lid lacerations]
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

anatomy
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

Anatomy

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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
ACUTE EYE CONDITIONS

anatomy

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Subconjunctival hemorrhage

- **Symptoms:** Red eye, may have mild irritation
- **Sign:** Blood underneath conj. Following trauma
- **Ethiology:** 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 does not resolve or recurrent

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Corneal abrasion
ACUTE EYE CONDITIONS

Trauma

Anatomy

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Corneal abrasion

- **Abrasion**: 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 immediately

*anatomy*

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Traumatic hyphema
ACUTE EYE CONDITIONS

trauma

anatomy

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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 (ไม่)ปิด patch

analgesics (not ASA)

sedative drug

antiglaucoma: IOP > 30 mmHg

1% atropine drops 3-4 x /day

aminocaproic acid
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

If admit not die: Admit to hospital as a medical emergency

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
Conjunctival foreign body
Conjunctival foreign body

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 วันสิ้นสุดในรายที่มี residual FB
ACUTE EYE CONDITIONS

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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.

R/O IOFB
Corneal foreign body

Management

Remove FB

ยาชา สลับกับ antibiotic q 5 min x 6

irrigate

เข็ม # 25 remove FB (ฉีดขยายน้ำ)

เขี่ยออกจาก dome ของ cornea

Remove rust ring

วัดขนาดของ epithelial defect : FU

antibiotic ED q 1-2 hr or

antibiotic EO + PP
**Corneal foreign body**

**FU lesion < 1-2 mm ไม่บริเวณ patch ต่อ**

- clean, non-central

  Topical antibiotic ใช้ 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

  ที่สำคัญควรปรึกษาภักษุแพทย์ด้วย
ACUTE EYE CONDITIONS

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anatomy
Intraorbital foreign body
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
   ➜ erythematous lid

Trauma
Intraorbital foreign body

😊 FB

.simps

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

笑脸 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

Treatment

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

Follow-up

- VA, RAPD, IOP, EOM, proptosis
- oral antibiotic 10-14 d
Ruptured globe & Penetrating injury
ACUTE EYE CONDITIONS

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57
ACUTE EYE CONDITIONS

trauma

anatomy

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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
ACUTE EYE CONDITIONS

trauma

anatomy

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Orbital Blow-out fracture
ACUTE EYE CONDITIONS

anatomy

trauma
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
ACUTE EYE CONDITIONS

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Orbital Blow-out fracture

😊 Differential Diagnosis

อังก Orbital edema and hemorrhage(185,266),(824,782)
(limitation of EOM, but resolve > 7-10 d.)

Craniad nerve palsy
(limitation of EOM, no restriction on forced duction testing.)
ACUTE EYE CONDITIONS

Retrobulbar Hemorrhage

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
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 24-48 hr.
- Re-examination at 10-14 d after trauma
Orbital Blow-out fracture

😊 Surgical indications (controversy)

โปรด entrapment of orbital contents

 chóng diplopia within 30 degrees of primary position

 chóng positive forced duction test & X-ray : entrapment

 chóng cosmetically unacceptable enophthalmos

 chóng fractures (1/2 of orbital floor, large medial wall

 fibrosis & contracture of prolapsed tissue

 anatomy

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Traumatic Optic Neuropathy
ACUTE EYE CONDITIONS

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anatomy

trauma
Traumatic Optic Neuropathy

😊 Symptoms: VA after trauma

😊 Critical Signs: new RAPD +

😊 Others Signs: relatively poor color vision VF defect
Traumatic Optic Neuropathy

**Ethiology:**

- Shearing injury: blunt trauma
- Compression: bone, hemorrhage
- 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:

prowadzi admit in acute cases

⏵ iv antibiotics: sinus wall fracture

☞ genta.+ cefazolin or clinda.

⏵ iv steroid: methylprednisone

☞ 250 mg iv q 6 hr

☞ 1 gm iv OD
Traumatic Optic Neuropathy

😊 FU :

⏰ daily
⏰ evaluate VA if refer
⏰ pupillary reactions
⏰ color vision