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WEXNER MEDICAL CENTER

Trauma

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Brief Introduction








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Objectives

- Review different situations of orbital and ocular trauma
 - Discuss key exam findings and symptoms
 - Discuss appropriate treatment for different traumatic situations

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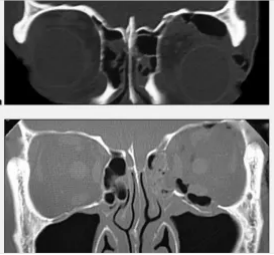
Outline

- Orbital Trauma
 - Orbital fractures
 - Entrapped muscle
 - Avulsed muscle
 - Retробulbar hematoma
- Adnexal Trauma
 - Eyelid lacerations
 - Non-margin-involving
 - Margin-involving
 - Canalicular involving
 - Conjunctiva
 - Conjunctival abrasion
 - Subconjunctival hemorrhage
 - Sclera
 - Partial thickness scleral laceration
- Cornea
 - Corneal abrasion
 - Partial thickness corneal laceration
 - Corneal foreign body
- Open Globe Injuries
- Iris/Angle
 - Hyphema
 - Traumatic iritis
 - Traumatic mydriasis
 - Iridodialysis
 - Cyclodialysis
- Lens
 - Cataract
 - Zonulopathy → subluxation/dislocation
- Vitreous
 - Hemorrhage
 - PVD
- Retina
 - Comotio retinae
 - Retinal hemorrhage
 - Retinal tears/detachment
 - Retinal dialysis
- Choroid
 - Choroidal rupture
 - Choroidal hemorrhage
 - Choroidal effusion
- Optic nerve
 - Traumatic optic neuropathy
 - Optic nerve avulsion

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Orbit

Orbital Fracture




- Symptoms
 - Common: pain, soreness, blurred vision
 - Concerning symptoms:
 - Double vision
 - Nausea/vomiting
 - Severe pain or loss of vision
- Key exam areas
 - Extracocular motility
- Treatments
 - Sinus precautions
 - No drinking through straws
 - No straining or strenuous activity
 - No flying or swimming
 - No blowing nose (can use saline rinses)
 - Sneeze with mouth open
 - Icing

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Orbit

Entrapped Extraocular Muscle

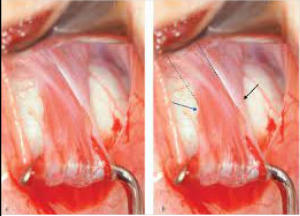


- Symptoms
 - Severe pain with eye movements
 - Double vision
 - Nausea/vomiting
 - Bradycardia
- Key exam areas
 - Restricted eye movements when moving opposite to entrapped muscle
- Treatments
 - Urgent surgery

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Orbit


Avulsed Extraocular Muscle



- Symptoms
 - Double vision
 - Pain
- Key exam areas
 - Strabismus
 - Loose muscle when moving opposite to avulsed muscle
- Treatment
 - Surgery

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Orbit
Retrobulbar hematoma



- Etiology
 - Trauma
 - On anticoagulation + straining
- Symptoms
 - Pain
 - Loss of vision
- Key exam areas
 - Pupils
 - IOP
- Treatments
 - Exam reassuring → monitor
 - IOP high, APD, decreased vision → lower IOP
 - Lateral canthotomy and cantholysis

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Eyelid
Non-margin-involving laceration



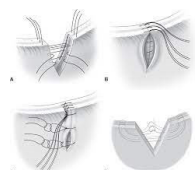
- Key history points
 - Mechanism of trauma
 - Animal bite → higher risk of infection
 - Projectile object → ?orbital or intraocular foreign body (?need for CT scan)
 - Any vision changes
- Symptoms
 - Pain
 - Loss of vision
- Treatments
 - Simple suture repair
 - Ointment (antibiotic +/- steroid)

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Eyelid
Margin-involving laceration




- Treatments
 - More complex suture repair
 - Ointment (antibiotic +/- steroid)

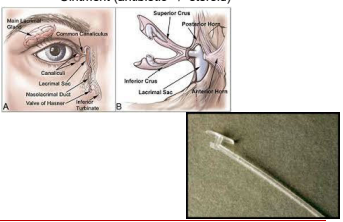


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Eyelid
Canalicular-involving laceration




- Treatments
 - More complex suture repair – may require OR
 - Ointment (antibiotic +/- steroid)



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Conjunctiva

Conjunctival abrasion




- Symptoms
 - Common
 - Pain
 - Redness
 - Tearing
 - Photosensitivity
 - Concerning symptoms:
 - Loss of vision
- Key exam areas
 - Fluorescein staining (cornea/conjunctiva)
- Treatments
 - Lubrication: erythromycin ointment

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Cornea

Corneal abrasion




- Etiology
 - Trauma
 - Recurrent corneal erosions
- Symptoms
 - Common
 - Pain
 - Redness
 - Tearing
 - Photosensitivity
 - Blurred vision
 - Concerning symptoms:
 - Severe loss of vision
- Key exam areas
 - Fluorescein staining (cornea/conjunctiva)
- Treatments
 - Antibiotic drops
 - Lubrication
- Young/healthy → heal quickly
- Old/unhealthy → heal slower

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Conjunctiva

Conjunctival laceration

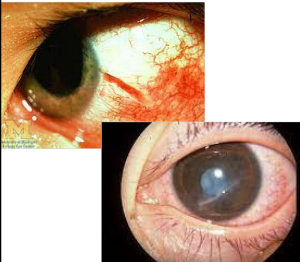


- Symptoms
 - Common
 - Pain
 - Redness
 - Tearing
 - Photosensitivity
 - Concerning symptoms:
 - Loss of vision
- Key exam areas
 - Fluorescein staining (cornea/conjunctiva)
 - Careful exam of sclera
- Treatments
 - Lubrication: erythromycin ointment
 - Suture: if large and easily accessed

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Sclera

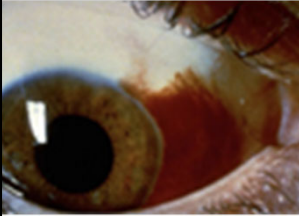
Corneal/Scleral laceration – partial thickness



- Key exam areas
 - Fluorescein staining (cornea/conjunctiva)
 - Careful exam looking for leaking, uveal tissue
 - Pupil peaking
 - IOP
- Treatments
 - If mild/small/shallow → lubrication and careful observation
 - If long/deep → OR for suture to reinforce

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Conjunctiva
Subconjunctival hemorrhage


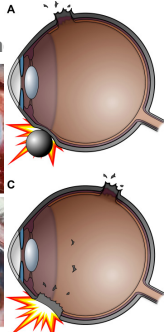


- Etiology
 - Trauma (including rubbing eye)
 - On anticoagulation + straining
 - Spontaneous
- Common symptoms
 - Irritation
 - Mild blurred vision
- Concerning symptoms
 - Loss of vision
 - Severe pain
- Key exam findings
 - Fluorescein staining: delen
- Treatments
 - Lubrication
 - Reassurance: can take weeks to resolve
 - Typically don't need to stop meds (anticoagulation)

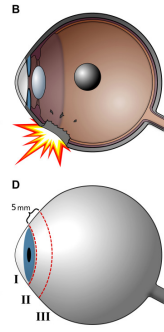
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Globe

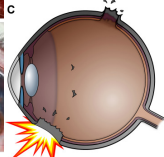
Full thickness

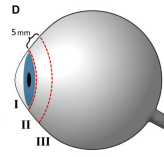
Globe Injury



injury vs

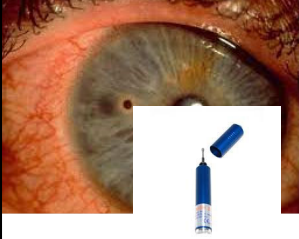


cutity)



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Cornea
Corneal foreign body



- Etiology
 - Trauma (including rubbing eye)
- Common symptoms – sometimes delayed
 - Irritation
 - Pain
 - Photosensitivity
 - Mild blurred vision
- Concerning symptoms
 - Loss of vision
 - Severe pain
- Key exam findings
 - Fluorescein staining
 - Careful exam for intraocular FB
- Treatments
 - Slit lamp removal (30 gauge needle)
 - Burr
 - Topical abx

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Iris/Angle
Hyphema



- Etiology
 - Trauma
 - Spontaneous: h/o PDR
- Symptoms
 - Pain
 - Light sensitivity
 - Loss of vision
- Key exam findings
 - IOP
- Treatments
 - Manage IOP
 - Medical (drops/Diamox) vs surgery (AC washout)
 - Prednisolone acetate
 - Atropine
 - Monitor for glaucoma

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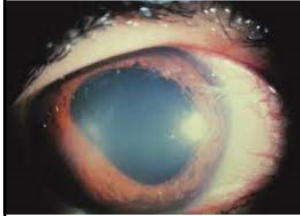
Iris/Angle
Traumatic Iritis



- Symptoms – usually delayed
 - Pain
 - Light sensitivity
- Key exam findings
 - IOP
- Treatments
 - Manage IOP
 - Medical (drops/Diamox) vs surgery (AC washout)
 - Prednisolone acetate
 - Atropine

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Iris/Angle
Traumatic mydriasis



- Symptoms
 - Pain
 - Light sensitivity
 - Blurred vision
- Key exam findings
 - IOP
- Treatments
 - Treat iritis is present
 - Observe → if persists and bothersome → contact lens vs surgical repair (iridoplasty)

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Iris/Angle
Iridodialysis/Cyclodialysis



- Symptoms
 - Light sensitivity
 - Blurred vision
- Key exam findings
 - IOP
- Treatments
 - Observe → if persists and bothersome → contact lens vs surgical repair (iridoplasty)
 - Monitor for glaucoma

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Lens
Cataract

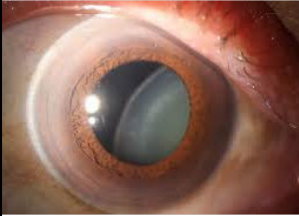


- Symptoms
 - Best corrected visual acuity (BCVA)
 - Light sensitivity
 - Decreased vision
- Treatments
 - Observe if mild/patient not bothered
 - Cataract surgery

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Lens

Zonulopathy → subluxation/dislocation

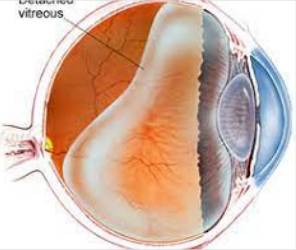


- Symptoms
 - Light sensitivity
 - Decreased vision
 - Seeing the edge of the lens
- Key exam findings
 - BCVA
 - IOP
 - Lens position
- Treatments
 - If mild + good vision + no IOP issues → observe +/- spectacle correction
 - If severe, bad vision, pupillary block (high IOP) → cataract extraction
 - Typically require scleral fixated or AC-IOL

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Vitreous

Posterior Vitreous Detachment

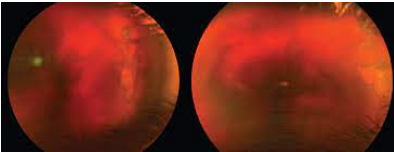


- Symptoms
 - Flashing lights
 - New floaters
- Key exam findings
 - Anterior vitreous (shafer sign - pigment)
 - Retina exam with scleral depression
- Treatments
 - Close observation: repeat exam
 - Retina precautions: return ASAP if worsening floaters, flashing lights, curtain

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Vitreous

Vitreous Hemorrhage

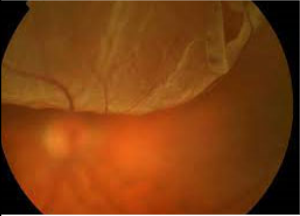


- Symptoms
 - Hazy vision
- Key exam findings
 - Retina exam with scleral depression
 - B-scan
- Treatments
 - Positioning: sit up, sleep upright or with several pillows, limit physical activity
 - Close observation: repeat exam
 - Retina precautions: return ASAP if worsening floaters, flashing lights, curtain

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Retina

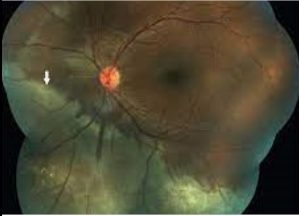
Retinal tears/detachments



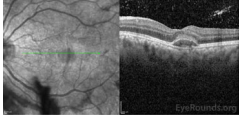
- Symptoms
 - Flashing lights
 - New floaters
 - Curtain/darkening of visual field
- Key exam findings
 - Retina exam with scleral depression
- Treatments
 - Tear alone +/- minimal detachment: laser
 - Detachment: surgery

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Retina
Comotio Retinae




- Symptoms
 - Blurred vision (especially if central edema)
- Key exam findings
 - Retina exam
- Treatments
 - Monitor
 - Retina precautions



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Retina
Retinal hemorrhage



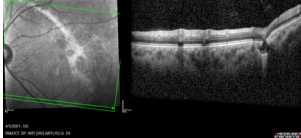
- Symptoms
 - Blurred vision (especially if central edema)
- Key exam findings
 - Retina exam
- Treatments
 - Monitor – blood can take weeks/months to resolve
 - Retina precautions

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Choroid
Choroidal rupture/scleropteria

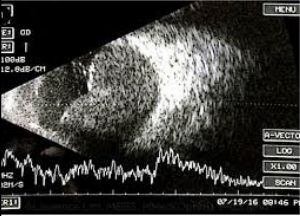


- Etiology
 - Trauma: especially penetrating orbital trauma (high velocity)
- Symptoms
 - Blurred vision (
- Key exam findings
 - Retina exam
- Treatments
 - Monitor – can develop CNVM
 - Retina precautions
 - Amsler grid monitoring



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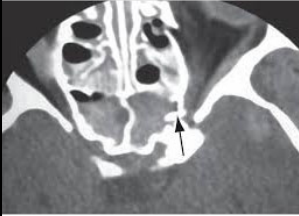
Choroid
Choroidal hemorrhage/effusion



- Symptoms
 - Pain
 - Loss of vision
- Key exam findings
 - IOP
- Treatments
 - Manage IOP (drops/Diamox)
 - Prednisolone acetate
 - Atropine
 - Can take weeks to resolve
 - Surgical drainage (less common)

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Optic Nerve
Traumatic optic neuropathy



- Symptoms
 - Sudden vision loss after trauma
- Key exam findings
 - Vision (predictive of final VA)
 - Pupils
 - Color vision
 - No other explanation of vision loss
- Types
 - Direct vs Indirect
 - Direct → poorer prognosis
 - Presenting VA more predictive of final VA
- Treatments
 - Observation – if no improvement after 48 hrs, less likely to improve
 - If direct → consider surgery
 - Steroids of no benefit

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Optic Nerve
Optic Nerve Avulsion



- Symptoms
 - Loss of vision
- Key exam findings
 - VA
 - APD
- Treatments
 - Monitor - poor prognosis


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Summary

- Trauma can happen to any part of the eye
- History details are important (mechanism of injury, projectile objects, etc.)
- Vision and pupil exams on everyone
- IOP drives management in many cases (hyphema, retrobulbar hematoma, lens dislocation, etc.) – ok to defer if worried about open globe

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Thank you!



Questions???

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