Ocular Emergency Management
COPE 39727-SD

Derek Cunningham, OD
General Trauma

• Take care of the obvious
  • ABC's
  • Radiology
  • Concussion evaluation
  • Mental status of patient

History

• Take your time with the history.
• Inquire about angle of impact
• Nature of insulting object
• Sharp, dull, big, small
• Prior treatments
• What was your vision before the injury?
Vision

• Must Check VISION
• Paramount Duty both legally and medically

Start with the most serious

• Open globe
• Major orbital trauma
• Intraocular foreign body
• Head/Neck trauma

CT

• If you suspect any of the previous, a CT scan is indicated
• Axial and Coronal sections (1mm) needed for suspected blow out
• No MRI for fear of metallic foreign body
Open Globe

• Check VA - reduced
• Seidel's sign
• Fi stain
• Displaced pupil/expelled contents
• Non-reactive pupil
• Low IOP
• Poor reflex
• Hyphema

Open Globe

• Do not patch
• Shield Eye
• Send to ER
• Disproportionate conjunctival edema could be a possible indication of scleral rupture

Blunt Trauma

• Check VA
• Proptosis from retrobulbar hemorrhage
• Contusion/sub-conj hemorrhage
• Retinal detachment
• Commotio Retinae
• Traumatic uveitis or hyphema
• Traumatic cataract
• Blow out fracture
Contusion

- Need to get eye open
  - Will dictate urgency of consult
- Assess lids and globe for debris or lacerations
- Check pupil response (round pupil)
- Red Reflex?

Contusion

- Do eyes move well together
- Instill Fl to check for abrasions
- Check IOP if all else is clear
- Palpate bony orbital rim checking for tightness or crepitus (orbital emphysema)
- Check for orbital step off

Black Eyes

- Severe
- Palpate orbital rim
Lid lacerations

- Check VA
- Difficult to suture because of tarsal plate and margin function
- Refer to ophtho
- Tetanus prophylaxis
- Upper lid skin has no subcutaneous fat

Upper Lid

- Must consider levator/aponeurosis
- NO subcutaneous fat

Lower lid

- Lacerated canthus
- Lacrimal drainage system
- Quality reconstruction necessary

- Wound closure can be delayed for up to 3 days with satisfactory surgical outcomes in adults and 12-36 hours in children
  - Can be beneficial to allow swelling to go down, leading to better visualization of tissue re-approximation
MRSA

- Treat all athletes and healthcare workers as though they have MRSA

Periocular Infection

- Any antibiotic regimen should have adequate central nervous system penetration to minimize the risk of meningitis and cavernous sinus thrombosis
- Systemic steroid use is controversial and should only be used after sufficient antibiotic loading and on immunocompetent patients

LASIK

- Any corneal abrasion on a flap is serious.
- Microkeratome flaps can easily come off years after surgery
- Femtosecond flaps incredibly stable, but can still have issues
Radiation and Chemicals
- Ultraviolet/infrared
- Chemicals involved
  - Acids
  - Bases
  - Duration of chemical contact

Chemical Burns
- Check VA
- Alkali Burn is way worse than Acid
- Check pH if possible
- Immediate irrigation
  - Do not wait until they are at your office
- Absolute Emergency – 1 day consult at most for minor cases

Next Step?
- A. Run and Hide
- B. Add Steroids
- C. Pressure patch eye
- D. Watch in Amazement
Retrobulbar hemorrhage

• Symptoms
  • Eye pain
  • Diplopia
  • Vision loss
  • Reduced ocular motility
  • Proptosis

Retrobulbar Hemorrhage

• Signs
  • Proptosis
  • Increases IOP
  • Ecchymosis
  • Ophthalmoplegia
  • APD
  • Papilledema
  • Central retinal artery pulsation
Continuous cone-shaped fascial envelope
Acute orbital compartment syndrome

- Build up of volume is only held back by medial and lateral canthal tendons

Lateral Canthotomy

![Diagram of lateral canthotomy](image)
Cantholysis

Traumatic Optic Neuropathy

- Can often be the only ophthalmic injury after significant head trauma
- Believed to happen in the canalicular portion of the nerve
Traumatic Optic Neuropathy

• Visual outcome is poor
  • Regardless of treatment (high dose corticosteroids, optic nerve sheath fenestration, or optic canal decompression), outcome is poor

• RAPD presence is the most useful diagnostic test

The Ridiculous

Next Step?

• A. Surgically stabilize structures and explore surrounding tissue
• B. Use nostril entry technique to cut down stick in order to minimize scars
• C. Open surgical root inside lower eye lid to loosen stick
• D. Rip it out!
Case Example DC

- **CC:** Decreased VA OD, > 2 yrs, progressive, affects near and far, Glare OD>OS
- **BCVA:**
  - OD: 20/70-2  PH 20/60
  - OS: 20/25-2   BAT 20/50-
- **SLE:** Cataracts OD>OS
- **12/02/08 – Unremarkable Cataract Sx OD**

Postoperative Day 1

- Pain last night, today better
- **UCVA:** OD: 20/40 PH 20/30
- **IOP:** 18 at 1:55pm
- **SLE:**
  - Wound secure
  - 2+ SPK
  - AC well formed with about 1+ cell
  - IOL well centered in pupil

Postoperative Medication

- Review medications
- No restrictions on physical activity
- Remind patient that it is normal for vision to be blurry and eyes out of balance
- **F/U** 1 week
- Fax results to surgeon if co-managed
Weekend Emergency

- CC: VA decreased and foggy, no pain
- BCVA: OD 20/200 PH/NI
- IOP: 10 mmHg
- SLE: 3-4+ cells / deep / PVD / 3+ Vitritis / Dot hemes / whitening throughout periphery
- A: Increased post op inflammation OD
- P: Omnipred q1h OD, Nevanac TID, Vigamox TID / F/u tomorrow

Thoughts???

- Sudden decrease in vision
- Increase in inflammation
- No PVD noted previously
- No pain / discomfort
- Dot hemorrhages in the periphery

Differentials

- Endophthalmitis
- CMV Retinitis
- Pars Planitis
- Inflammatory chorioretinitis
Endophthalmitis

- 3-5 days after surgery
- 4+ cell and hypopyon
- Pain
- Eyelid edema
- Decreased vision
- If patient calls with symptoms during the first week: the doctor must see the patient
- Surgical emergency: hours (not days) make a difference

Endophthalmitis Vitrectomy Study

- 69% of patients with bacterial endophthalmitis were culture-positive

Endophthalmitis – Strain Susceptibility

- Coagulase Negative Staph
- MRSA
Recent Cataract Endophthalmitis Rates (2003-2005)

Endophthalmitis Vitrectomy Study

<table>
<thead>
<tr>
<th>Presenting VA</th>
<th>VA Outcomes</th>
<th>Recommend Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>HM or better</td>
<td>20/40 or better</td>
<td>TAP</td>
</tr>
<tr>
<td>PPV</td>
<td>62% 84% 3%</td>
<td>TAP</td>
</tr>
<tr>
<td>Light Perception</td>
<td>11% 30% 47%</td>
<td>PPV</td>
</tr>
<tr>
<td>PPV</td>
<td>33% 56% 20%</td>
<td>PPV</td>
</tr>
</tbody>
</table>

PPV = pars plana vitrectomy and intravitreal injection of antibiotics
TAP = vitreous tap and intravitreal injection of antibiotics

http://www.ncti.nih.gov/netrials/viewstudyweb.aspx?id=29#Results

CMV Retinitis

- Slow-growing herpesvirus infection
- Commonly seen in immunocompromised
- Decreased VA / floaters
- No pain
- Full thickness retinal lesion
- Mild or absent vitritis
- Retinal hemorrhages
- Rhegmatogenous RD
Progressive Outer Retinal Necrosis

- Devastating, necrotizing herpetic retinitis
- Most common in immunocompromised
- Previous Hx of HZO
- Bilateral
- Peripheral outer retinal whitening with rapid progression
- Vitritis mild or absent

Pars Planitis

- Idiopathic, noninfectious inflammation of the vitreous cavity
- Younger than 40 yoa
- 80% Bilateral
- “Snowballs”
- Associated signs
  - Posterior synechiae
  - PSC
  - CME
  - ERM

Next Day Visit

- Increase in pain today
- OD VA: 20/400 NI w/ Pinhole
- SLE: Central K stain w/ Dendritic appearance / 2+ Cells in AC / 3 + Cells in Vitreous / Dot hemorrhages / Retinal whitening
What’s She Have????

- **Possible Acute Retinal Necrosis**
  - Foscarnet 2.4 mg/0.1cc injected intravitreally
  - Vicodin 5/325 1 tab every 4-6 hrs PRN for pain
  - Valtrix 1000mg every 8 hrs for 10 days
  - Ordered blood cultures, fungal, PCR for VZV, HSV 1, HSV 2, gram stain, CBC, Chem 7, ESR, and C-reactive protein

- **Cannot r/o bacterial endophthalmitis**
  - Recommend intravitreal injections of Vancomycin 1mg/0.1cc and Ceftazidime 2.25 mg/0.1 cc.
  - Vitreous specimen sent to lab
  - Monitor very closely

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**Lab Reports**

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**Acute Retinal Necrosis**

- **Definition**
  - Necrotizing herpetic retinitis. May present unilaterally or bilaterally (20%)

- **Epidemiology**
  - Usually occurs in young, healthy adults.
  - Less common are elderly and immunocompromised
  - Caused by infection with HDV or HSV

- **History**
  - Iritis or episcleritis
  - Rapid decline in VA with intense vitritis
Acute Retinal Necrosis

- **Important Clinical Signs**
  - Vitritis with peripheral retinal whitening that coalesces

- **Associated signs**
  - Iridocyclitis, photophobia, vitritis, optic neuritis, and retinal arteriolitis

- **Diagnosis**
  - Diagnosis based on clinical exam
  - Polymerase chain reaction
  - Retinal biopsy

- **Management**
  - Systemic antiviral treatment
  - IV acyclovir 10mg/kg tid for 7 to 10 days
  - Followed by 3 month course of acyclovir po
  - 800mg five times per day
  - Risk of RD is 8 to 12 weeks
  - Laser photocoagulation
  - Pars Plana Vitrectomy

**Clinical Pearls**

- If patient calls with symptom of sudden decrease VA or pain during the first week: the doctor must see the patient
- Treat as infectious until proven otherwise
- Importance of communicating with surgeon
Thank you
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