Objectives

• Describe common eye injuries associated with sports
• Describe protective eye equipment and eye injury prevention
• Review the guidelines for the monocular athlete
• Briefly describe return to play recommendations for common eye injuries in sports
Epidemiology of Eye Injuries in the United States

- Sports cause 1/3 of eye injuries leading to blindness
- Sports responsible for > 40,000 eye injuries per year with rates increasing
- 90% considered preventable but eye protection not widely used
- Baseball and softball > basketball > raquetball > football > soccer
Sports Classification and Risk

• Classification:
  – **Collision** – football, rugby, hockey, lacrosse
  – **Contact** – baseball, soccer, basketball, wrestling
  – **Noncontact** – cross country-running, track, tennis, crew, swimming
  – **Other** – Bowling, golf, archery, field events
Sports Classification and Risk

- **Risk Categories:**
  - **High Risk** – baseball, paintball, basketball, baseball, softball, ice hockey
  - **Moderate Risk** – tennis, soccer, volleyball, football, fishing, golf
  - **Low Risk** – swimming, snow skiing, water skiing, bicycle, snowboarding
  - Disagreements exist over exact risk categories...risk increases with use of bat/ball/stick/puck/racquet
Field Eye Tray

- Ophthalmoscope
- Penlight
- Fluorescein dye
- Cotton tipped swabs
- Vision chart or vision app
- Sterile saline
- Contact lens remover
Eye Examination

• History
  – Foreign body sensation? Pain?
  – Diplopia? Photophobia?
  – Flashes of light? Floaters? Perception of decreased visual acuity?
  – Mechanism of injury...i.e. force and direction of impact
Mechanisms of Injury

• **Blunt** – account for majority of sports related eye-injuries
  – Orbital blowout fractures, orbital and lid contusions, hemorrhage, hyphema, retinal detachment

• **Penetrating** – relatively uncommon
  – Abrasions, lacerations

• **Radiation** – UV light exposure
Eye Examination

• Physical Exam:
  – Visual Acuity – portable Snellen chart or app
  – Pupils – size, reactivity, shape
  – Visual fields
  – Anterior chamber – foreign bodies, hyphema, abrasions, and lacerations
  – Extraocular ROM
  – External exam – ecchymosis, edema, proptosis, bony stepoffs
Basic Eye Anatomy
Traumatic Iritis

- Inflammation of the iris/irritation of anterior chamber due to blunt trauma
- Symptoms:
  - Photophobia, floaters, tearing, decreased visual acuity, ocular pain
- Exam:
  - Slit lamp, intraocular pressure measurement, visual acuity
Traumatic Iritis

• Treatment:
  – Topical cycloplegics and steroids
  – Refer to ophthalmologist urgently

• Return to Play:
  – Asymptomatic, normal visual fields and visual acuity
Hyphema

- Blood in anterior chamber of eye due blunt trauma to the eye
- Symptoms:
  - Blurred vision, photophobia, pain
- Exam:
  - Slit lamp and intraocular pressure measurement
Hyphema

• Treatment
  – Urgent referral to ophthalmologist
  – Shielding of eye, bed rest with head elevation at 30 degrees
  – Risk of rebleeding which can affect vision

• Return to Play:
  – After ophtho clearance and complete resolution
Corneal Abrasion

• Common eye injury in athletes
• Defect in corneal epithelial surface
  – Typically due to trauma
  – Can occur spontaneously
• Symptoms:
  – Foreign body sensation, irritation, pain, tearing, photophobia
• Exam:
  – Topical anesthetic drops if needed, upper lid inversion, fluorescein stain +/- cobalt blue light, ophtho referral if symptoms persist despite treatment
Corneal Abrasion

• Treatment:
  – Topical antibiotics and cycloplegics
  – No need for eye patching but can wear sunglasses
  – Consider ophtho referral for contact lens wearers

• Return to Play:
  – Healing has occurred and vision is normal
Eyelid Lacerations

• Typically occurs due to broken glasses
• Symptoms:
  – Pain and bleeding around the eye
• Exam:
  – Assess for protruding fat, involvement of lid margins/lacrimal sac or duct, full thickness injury...all require referral
Eyelid Lacerations

- **Treatment**
  - Primary closure within 12-36 hours
  - Superficial repair using 6.0 nylon

- **Return to Play**
  - Appropriate eye protection until sutures and wound healed
Corneal Foreign Body

• Symptoms similar to corneal abrasion
• Thorough inspection of upper and lower lid required...typically located in upper lid in tarsal plate
• Treatment:
  – Irrigation
  – Moist cotton swab
Subconjunctival Hemorrhage

- Due to bleeding into space between the conjunctiva and sclera
- Blunt trauma, spontaneous, lifting
- Symptoms:
  - Typically painless
- Return to play: Immediately if infection, globe rupture, significant trauma ruled out
Retinal Detachment

- Retinal tears due to blunt trauma to globe or head for most athletes
- Reported in endurance athletes with no trauma
- Much higher in myopic athletes
- Symptoms:
  - Flashes of light, floaters, decreased vision with blind spots, pain
Retinal Detachment

• Exam:
  – Visual acuity, EOM function, pupil and retina exam

• Treatment
  – Urgent referral to ophtho for surgical options

• Return to Play
  – Once cleared by ophtho
Globe Rupture

• Full thickness injury to sclera/cornea/ or both
• Consider with any blunt trauma directly to the orbit
• Signs & Symptoms:
  – Hyphema, pupil irregularity, 360 degree subconjunctival hemorrhage, pain, visual loss, flashes/floaters
Globe Rupture

• Treatment:
  – Once suspected...Eye shield and immediate referral
  – No manipulation of the eye
  – Analgesics and anti-emetics prn
  – Follow closely even after cleared

• Return to Play
  – Once cleared by ophtho
Orbital Fracture

- Usually orbital floor but can involve medial wall
- Occurs due to blunt trauma from object larger than orbital opening
- Signs/Symptoms:
  - Pain, swelling, crepitus with nose blowing, periorbital edema, ecchymosis, painful EOM, proptosis, stepoff, sensory changes
Orbital Fracture

- **Exam**
  - Inspect, palpation, sensation, and EOM
  - CT is recommended

- **Treatment**
  - Referral for surgical discussion

- **Return to Play**
  - Once cleared
Burns and Radiation Exposure

• Typically due to exposure to UVA and UVB
• Snow/water sports, mountaineering, athletes at altitude
• Pain, photophobia, tearing
• Sunglasses with UV blocking is best prevention
Eye Protection/Prevention

• “Strongly recommend protective eyewear for all participants in sports in which there is risk of eye injury”
  – Joint policy from Academy of Pediatrics and American Academy of Ophthalmology

• NCAA mandates eye protection only for women’s lacrosse currently
Eye Protection/Prevention

• American Society for Testing and Materials (ASTM)
  – Performance standards (ASTM F803-01) for eyewear most appropriate for sports with risk of ocular injury
    • Racquet sports, baseball, basketball, women’s lacrosse, field hockey
  – Protective polycarbonate lenses
    • Contact lenses and eyeglasses offer inadequate protection
    • Can attach to helmet if needed for particular sport
Monocular Athlete

• Corrected visual acuity of less than 20/40 in the eye with the defect/weaker eye

• Joint policy from American Academy of Pediatrics and American Academy of Ophthalmology:
  – All functional one-eyed athletes should wear ASTM standardized lenses at all times
  – Functional one-eyed athletes should not participate in boxing or full contact martial arts
Conclusion

• Eye injuries can be severe
• Most eye injuries can fortunately be prevented
• All athletes in appropriate sports should have eye protection...particularly those in high risk sports
• Significant athlete education required
References:


References


Questions?