Ocular Emergencies

What is an "emergency" to the patient is not necessarily an emergency to the staff.

"the dog ate my glasses and I’m going on vacation tomorrow"

"I lost total sight suddenly in my right eye two weeks ago and now I have this lid droop !!!

OCULAR EMERGENCIES

• BLURRY VISION
  – WHAT IS THE HISTORY?
  – WHAT PART OF THE ANATOMY IS THE CAUSE?

VISUAL ACUITY

SNELLEN CHART
NEAR CARD CONSIDER AGE
AVAILABLE PRINT
C.F./H.M. DISTANCE
LIGHT PERCEPTION

VISUAL FIELD

ASSESS VISUAL ACUITY
Try to determine the extent of the problem:
  color changes
  field of vision
OCULAR EMERGENCIES
Changes in appearance

"red eye"
subconjunctival hemorrhage
inflammation with injection
ptosis

SUBCONJUNCTIVAL HEMORRHAGE
(spontaneous)

3 BASIC QUESTIONS:
- Over "white" of the eye?
- Does it hurt?
- Change in vision?

SUBCONJUNCTIVAL HEMORRHAGE

• SPONTANEOUS, ETIOLOGY UNDETERMINED
• COUGHING, SNEEZING = physical pressure
• HYPERTENSION
• ANTICOAGULANTS
• IF TRAUMATIC, MAKE SURE THERE IS NO OTHER INJURY; MAY MASK AN IODFB

PTOSIS

• HISTORY

- WAS IT THERE BEFORE
- DID AN EVENT CAUSE IT (trauma)
- ANY RELATED MEDICAL HISTORY
  myasthenia
OCULAR EMERGENCIES

• REFRACTIVES CHANGES
  » Pin hole refraction
  » glasses
  » Near card
    - any near card

REFRACTIVE CHANGES

AQUEOUS
  – Inflammation - flare and cells - hypopion
  – Blood - hyphema

LENS
  – Lens (IOL) dislocation
  – Cataract

VITREOUS
  – Vitritis
  – Hemorrhage
  – Intravitreal foreign body

RETINA / VASCULAR
  – non - refractive

Ocular Emergencies

Circulatory emergencies
  arterial occlusions
    longstanding
      vasculopathy
    embolic
      origin?
Ocular Emergencies

Circulatory
venous occlusions
manage the systemic condition
hypertension

Ocular Emergencies

glaucoma
acute attack – rapid increase in pressure
treat as soon as possible to avoid
permanent optic nerve damage

Ocular Emergencies

EXTERNAL & SURFACE INJURIES

OCULAR TRAUMA

EYELID LACERATIONS
SUBCONJUNCTIVAL HEMORRHAGE
CORNEAL ABRASION
FOREIGN BODIES
BLUNT/SHARP TRAUMA
CHEMICAL BURNS
OCULAR TRAUMA

**GENERAL RULE:**
More intraocular damage the less intraorbital or orbital damage and vice versa

MOMENTUM

THE GREATER THE MOMENTUM – THE GREATER THE DAMAGE

velocity \times mass = momentum

speed \times size = "punch"

SKULL = PROTECTIVE ANATOMY

Orbit encircling globe

sinuses

OCULAR TRAUMA

EVALUATION
HISTORY BEFORE THE EXAMINATION

CAUSATIVE AGENT
FORCE & DIRECTION

• BASIC ANATOMY
  OBSERVE STRUCTURE
  - "GATHER THE EVIDENCE"

OCULAR TRAUMA

PRIOR TO MANIPULATING EYE
• PEN LIGHT – VISUAL EXAM
• OBTAIN VISUAL ACUITY

OCULAR TRAUMA

EYELID LACERATIONS

• CHECK FOR INVOLVEMENT OF PUNCTI, CANALICULAR DUCTS
• CHECK FOR UNDERLYING INVOLVEMENT OF GLOBE
**EYELID LACERATIONS**  
(repairs)

- MINOR HORIZONTAL CUTS CAN BE SUTURED
- IF EYELID MARGIN INVOLVED, NEED PLASTIC REPAIR TO PRESERVE LID FUNCTION AND TEAR INTEGRITY

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**FOREIGN BODIES: CONJUNCTIVAL**

- INSPECT THE CONJUNCTIVA  
  - TOPICAL ANESTHETIC
- FOREIGN BODY TENDS TO MIGRATE TO UPPER TARSUS (from blink mechanism)
- LEARN TO FLIP THE UPPER LID
- REMOVE WITH STERILE SWAB OR INSTRUMENT
- SWEEP THE UPPER CUL-DE-SAC
- ANTIBIOTIC COVERAGE ? AGENT
BULBAR CONJUNCTIVAL FOREIGN BODY

CORNEAL ABRASION

• ETIOLOGY
  – Object – finger, claw, vegetable, inert
  – Method – force
  • Bungee cord, weed wacker
  – RULE OUT IOFB

• TOPICAL ANESTHESIA usually helps in the diagnosis

CORNEAL ABRASION: TREATMENT

WARN OF CONTINUED PAIN
SYSTEMIC ANALGESIC
TOPICAL ANTIBIOTIC SOLUTION/ OINTMENT
CYCLOPLEGIC (2° IRITIS FREQUENT)
SEE THE NEXT DAY IF ABRASION LARGE OR CENTRAL
NEVER PRESCRIBE ONGOING TOPICAL ANESTHETIC
POTENTIAL RECURRENT EROSION
FOREIGN BODIES: CORNEAL

- TOPICAL ANESTHETIC
- EMBEDDED RUST NEEDS TO BE REMOVED AT SLIT LAMP OR FURTHER INFLAMMATION WILL OCCUR
- NON-METALIC MAY BE REMOVED WITH IRRIGATION OR GENTLY WITH SWAB
- STERILE SMALL NEEDLE, MECHANICAL BURR
- TOPICAL ANTIBIOTIC, CYCLOPLEGIC
- PAIN RX, SEE NEXT DAY

BLUNT TRAUMA: ANTERIOR SEGMENT

- FIST, TENNIS BALL, ETC; CHECK HISTORY
- CHECK VISION
- INSURE GLOBE IS INTACT
- CHECK PUPIL, MUSCLE FUNCTION, SKIN SENSATION
- PALPATE ORBITAL RIM, - IMAGING
OCULAR TRAUMA

BLUNT MECHANISM:
• ↓ A-P DIAMETER
• ↑ EQUATORIAL DIAMETER

Initial force resultant deformation, forces, pressure rise

↑ INTRAORBITAL PRESSURE
• EYE REACTION
  - DECREASES IN ANTERIOR - POSTERIOR DIAMETER
  - INCREASES IN LATERAL DIAMETER
• PRESSURE TRANSMITTED TO ORBITAL BONES AND CREATES SHOCK WAVE

REBOUND ELASTIC FORCES
EVERYTHING STARTS TO 'jiggle'

BLUNT TRAUMA
(resultant pathology)

• HYPHEMA
• TRAUMATIC IRRITIS
• DISLOCATED LENS
• RETINOPATHY
• RUPTURED GLOBE
• ORBITAL FRACTURE
BLOWOUT FRACTURE

• VERTICAL DIPLOPIA IR/IO
• SUBCUTANEOUS AIR ETHMOID
  — Precautions for nose blowing
• DECREASED SENSATION IN INFRA-ORBITAL NERVE DISTRIBUTION CHEEK
BLOWOUT FRACTURE

- Thin orbital floor, medial wall
- Orbital contents entrapped in fracture
- Clouding of maxillary, ethmoid sinuses on CT
OCULAR TRAUMA

EMERGENT MANAGEMENT

• SAFE TO SHIELD

• DO NOT PATCH - PREVENT ANY PRESSURE ON WHAT MAY BE AN OPEN GLOBE!

ORBITAL FRACTURE: EMERGENT MANAGEMENT

• IMAGING TO DEFINE THE PROBLEM
  – ULTRASOUND
  – X-RAY  CT  MRI

• SYSTEMIC ANTIBIOTIC

• TOPICAL ANTIBIOTIC (ABRASIONS)

• TOPICAL STEROID, CYCLOPLEGIC (IRITIS)

• PROTECTIVE SHIELD

ORBITAL FRACTURE: EMERGENT MANAGEMENT

• POST TRAUMATIC IRITIS
  – TOPICAL STEROID
    • AFTER EPITHELIUM HEALS
  – CYCLOPLEGIA FOR COMFORT

• PROTECTIVE SHIELD

• ENT, NEURO, DENTAL EVALUATIONS

HYPHEMA

• MAY BE FROM BLUNT OR PENETRATING TRAUMA

• PUPIL DISTORTION

• POOR VISION

• SHIELD THE EYE

HYPHEMA

• CHECK VISION

• MAKE SURE GLOBE INTACT

• NOTE BLOOD LEVEL – PRECISE MEASUREMENTS FOR MONITORING HEALING

• CHECK IOP, SICKLE CELL PREP
HYPHEMA

EVALUATE THE POSTERIOR POLE

If you can’t see it – it’s no excuse

ULTRASOUND

RADIOLOGICAL IMAGING

LOOSE CLOT

FORMED CLOTTED LAYER
HYPHEMA THERAPHY

- TOPICAL STEROIDS
  - HELPS WITH THE INFLAMMATION
  - MONITOR IOP
- CYCLOPLEG – COMFORT AND EXAMINATION
- BED REST/ UPRIGHT TO HELP RBC’s SETTLE
- PROBLEM: RE-BLEEDS, BLOOD STAINING

PROJECTILE TRAUMA

SMALL INJURY MAY APPEAR MINOR BUT CAN CAUSE A LARGE AMOUNT OF DAMAGE
TRAUMA: POSTERIOR SEGMENT

- RETINAL EDEMA
- MACULAR EDEMA (BERLIN’S)
- CHOROIDAL RUPTURE
- RETINAL TEAR, DETACHMENT
- TRAUMATIC OPTIC NEUROPATHY
- AVULSION OPTIC NERVE

OCULAR TRAUMA

TRUE OCULAR EMERGENCIES

SECONDS COUNT
CHEMICAL INJURIES

- Flush, quick history **agent** topical anesthetic
- Immediate irrigation **liters**
  - Physiologic saline
  - Lactated Ringers
  - IV bottle ideal
- Remove particulate matter
- Get to 7 pH

OCULAR TRAUMA

- **Chemical Injury**
  - Irrigate!
  - Flush!
  - Dilute!
  - Minimum 30 minutes!
PROJECTILE TRAUMA

THIS DOESN’T LOOK GOOD!
how deep
how much damage
how do I get it out
THE ANSWER
provided by his co-worker
WHAT'S THE DIAGNOSIS?

THAT'S ALL FOLKS

THANKS AGAIN FOR THE OPPORTUNITY AND HONOR

“Dr. D”