Evaluation and Management of Facial Trauma

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Introduction to Facial Trauma

- Anatomy (Skull base down to the mandible)
- Review common fractures
- Evaluation
- Management
Facial Trauma

- Emergent
  - Protect or provide the airway
  - Control of hemorrhage
  - C-Spine stabilization
  - Control of life-threatening injuries

- Urgent

- Outpatient care
Incidence

- In US, ~ 2 million head injuries yearly
- MVA are the leading cause
- Assaults
- Industrial accidents
- Recreational accidents
Skull Base Fractures
Skull Base

- Anterior Fossa
- Central Skull Base
- Middle Fossa
- Posterior Fossa

70%
20%
5%
5%

Frontal bone
Sphenoid bone
Temporal bone
Occipital bone
Skull Base
Physical Exam

- Periorbital ecchymosis (Raccoon eyes)
- Mastoid ecchymosis (Battle's sign)
- Anosmia
- Vision changes
- CSF rhinorrhea or otorrhea
- Hearing loss
- Facial weakness / paralysis
Periorbital Ecchymosis & Mastoid Ecchymosis
CSF

- 50% appear in first 2 days
- 70% within 1 week
- Halo sign v Beta 2 transferrin
CSF Leak Treatment

- Conservative management
  - Strict bedrest
  - HOB > 30°
  - Limit sneeze and cough
  - Cessation of nose blowing and straining
- Antibiotics ??
- Lumbar drain ~ after 7 days
- Surgical intervention is reserved for conservative mgmt failures.
  - < 10%
Imaging

- HRCT scan is the gold standard for skull base and facial injury.
  - It has the best modality to evaluate bony fractures.

- CT Angiography
  - Efficient and non-invasive technique to evaluate the vasculature.
Temporal Bone

- Occur in 14-22% of all skull base injuries
- Houses the hearing and balance center
- Facial nerve
- Portion of the Carotid Artery
Longitudinal Temporal Bone Fractures

- Parallels the ear canal
  - 70-90%
  - Temporoparietal impact
- Facial nerve injury
  - 10 – 25%
Transverse Temporal Bone Fracture

- Perpendicular to ear canal
  - 10-30%
- Frontal or occipital impact
- Facial nerve injury
  - 30-50%
Physical Exam

- Otorrhea
- Hemotympanum
- TM perforation
- Facial palsy
  - Immediate v delayed
- Periorbital ecchymosis & Postauricular ecchymosis
Frontal Sinus Fractures
Frontal Sinus Fracture

- 5-12% of facial fractures
  - Males > Females
- Ant table 4mm to 12mm
- Post table 0.1mm to 2 mm
- 2/3 Anterior and Posterior table
- 1/3 Just anterior table
- Etiology
  - Story time....
Work-up & Associated Injuries

- Forehead swelling and paresthesia
- Laceration and deformity
- Loss of consciousness – 72%
- Obtunded / intubated – 21%
- Intracranial injuries
  - Pnemocephalus – 26%
  - Cerebral contusion – 18%
  - Dural tear – 14%
  - CSF leak – 11%
  - Epidural Hematoma – 8%
Management

- Primary Goal
  - Protect brain from further injury

- Secondary Goal
  - Functional Frontal Sinus
  - Cosmetic

- CT scan

- CSF leak?

- Repair v Observation
  - ORIF
  - Cranialization
  - Obliteration
Orbital Floor Fractures
Orbital Fracture
History and Exam

- Mechanism of injury
- Double vision / blurry vision
- Entrapment
- Facial numbness
- Nausea and vomiting
  - Especially in children
- Cardiac Exam
  - Bradycardia and low BP
Retrobulbar Hematoma

- Hematoma causes increased IOP
- Pressure on retinal A.
- Eye ischemia (compartment syndrome)
- Vision loss

Tx: lateral canthotomy, meds to lower IOP
Orbital Hematoma

- Lateral canthotomy
- Lateral canthal tendon lysis
- Meds
  - IV acetazolamide 500mg
  - IV mannitol 0.5 g/kg
- Surgical decompression of the orbit
Surgical Indications

- Oculocardiac reflex
- Obvious Entrapment
- Enophthalmos > 2mm
- Fracture > 50% orbital floor
- Diplopia for 7 days
- Observation
  - No Nose Blowing!!!!!
Mid Face Fractures
History and Exam

- Accurate history may be difficult
  - Intubated and Sedated
  - Associated injuries
  - Inebriated

- Exam
  - Head and Neck Exam
  - Palpate for bony crepitus
  - Facial Step offs
  - Mobile midface
  - Ophthalmic Exam
Exam

- Periorbital Ecchymosis
- Midfacial Swelling
- Laceration
- Bleeding
- Subconjunctival hemorrhage
- Subcutaneous air
  - Sinus involvement
Midfacial Fractures (Le Fort)

- French Pediatric and Ortho Surgeon
- Used intact cadaver heads
  - Delivered blunt forces from different angles and magnitude
- Help stage the degree of severity of the fractures
- Classical description of all Le Fort fractures are bilateral and symmetrical
- Pure Le Fort Fractures are rare
- Commonly associated w other midface fractures
Le Fort I

- Upper alveolus becomes separated from upper maxilla
- Involves
  - Floor of the nose
  - Maxilla palate
  - Pterygoid plates
Approach
Le Fort II & ZMC

- Involves
  - Nasal Superstructure
  - Face of the maxilla
    - May involve V2

- More Common is the zygomaticomaxillary complex fracture (ZMC)
Approach
Approach
Le Fort III

- Craniofacial Separation
  - High Velocity Impacts
  - Extends across ZF suture, orbit, and NF suture

- Mobile Zygoma

- Can be devastating and involve intracranial injuries

- Surgery delayed until patient is neurologically stable
Approach
Are Prophylactic Antibiotics Useful in the Management of Facial Fractures?

Lisa M. Morris, MD; Robert M. Kellman, MD

- Prophylactic Abx are controversial
  - Preoperative and postoperative setting
  - Mandibular v mid facial fracture
    - Efficacy
    - Timing
    - Duration
    - Choice of abx
- No large multicenter RCTs
- Not enough data to evaluate efficacy of abx in non-mandible fractures
- Evidence to support no abx in non operative facial fractures
When to operate?

- Depends on the extent and complexity of the injury
  - Displaced fracture?

- Depends on patient
  - Comorbidities
  - Goals and Desires
    - Function vs. Aesthetics
Lower Face Fracture (Mandible Fracture)
Mandible Fracture

- Assault – 90% isolated mandible fracture
- 45-50% of all mandible fractures have more than 1 break

History
- Mechanism of injury
- Previous facial fracture
- Pre-existing occlusion
- PMHx
  - Epilepsy
  - Alcohol – DTs
  - MR
  - Psychiatric
Exam

- Malocclusion
- Anterior open bite
- Posterior cross bite
- Numbness to V3 area of face
- Trismus
- Floor of mouth swelling
- Airway compromise
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Management

- Re-establishment of occlusion is primary goal
- Prophylactic Abx should be used
- Monitor nutritional needs
Approach
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Questions and Discussion