Core Curriculum Syllabus

Emergencies in Otolaryngology-Head and Neck Surgery

FACIAL FRACTURES

A. General Considerations

- Look for other fractures like skull and/or cervical spine fractures
- Test function of cranial nerves
- Indications for reduction
    - Functional impairment
    - Cosmetic deformity
- Timing - As soon as is practical, but in general, delay of one week is not harmful. Delay may be necessary due to:
    - Edema or ecchymosis, which obscures skeletal deformity
    - Instability of patient due to other injuries

B. Nose

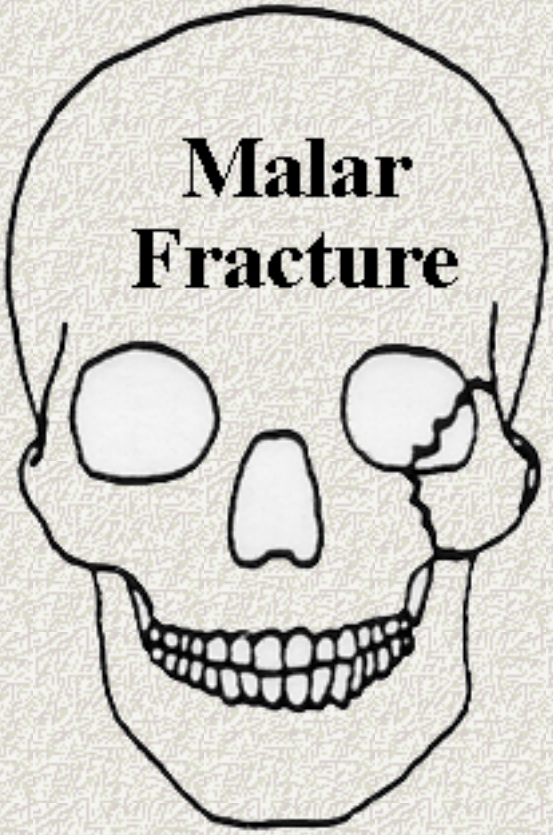
- Anatomy
    - Skin very closely related to skeleton
    - Two-thirds cartilaginous, one-third bony
    - Shock absorbing structure
    - Bony bridge extremely strong

- Types of Fracture
    - Lateral - most common
    - Depressed - due to dorsal blow
    - Nasofrontal ethmoidal - unusual and severe, involving displacement of nasal and frontal bones into the ethmoid area
- Diagnosis
    - Primarily physical exam
        - Pain and tenderness
        - Epistaxis
        - Nasal obstruction
        - Ecchymosis
        - Deformity - may be difficult to assess secondary to swelling or bleeding
    - X-rays usually not helpful
    - Look for septal hematoma
- Treatment
    - Control bleeding and minimize swelling with ice and elevation
    - DRAIN SEPTAL HEMATOMA IF PRESENT - Failure to diagnose and treat can lead to severe deformity
    - Prophylactic antibiotics
    - Swelling usually prohibits early evaluation and reduction. Advise head elevation to facilitate resolution.
    - Reduce within 5-7 days by closed or open manipulation. Indications for reduction are functional (obstruction) and/or cosmetic.
        - Simple fractures - splint one week
        - Nasofrontal ethmoidal
            - External fixation by lead plates or acrylic bar
            - Internal fixation with rigid fixation plates
            - May need to repair medial canthal ligament or lacrimal sac apparatus

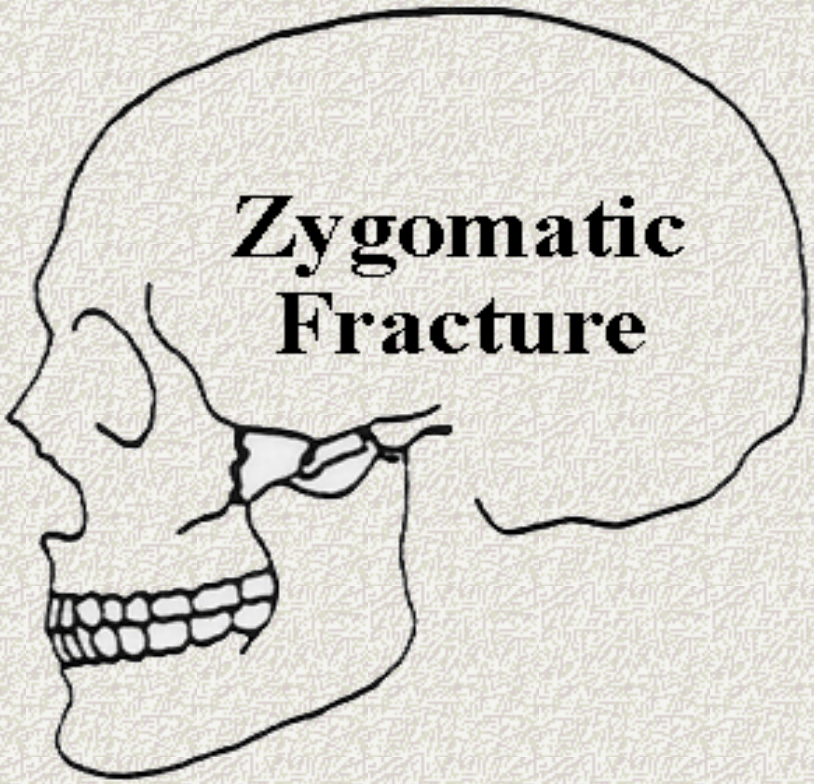
C. Orbit

- Anatomy: The orbit is a bony pyramid with the optic foramen at its apex
    - Floor of orbit is the roof of maxillary sinus
    - Medial wall - Lamina papyracea of ethmoid bone
    - Lateral wall Zygoma and sphenoid bone (greater wing)
    - Superior wall - Frontal bone - floor of frontal sinus and anterior fossa
- Types of Fractures
    - Orbital floor blow-out fracture

- Orbital rim
- Trimalar (tripod fracture, avulsion of lateral wall)



- Zygomatic arch



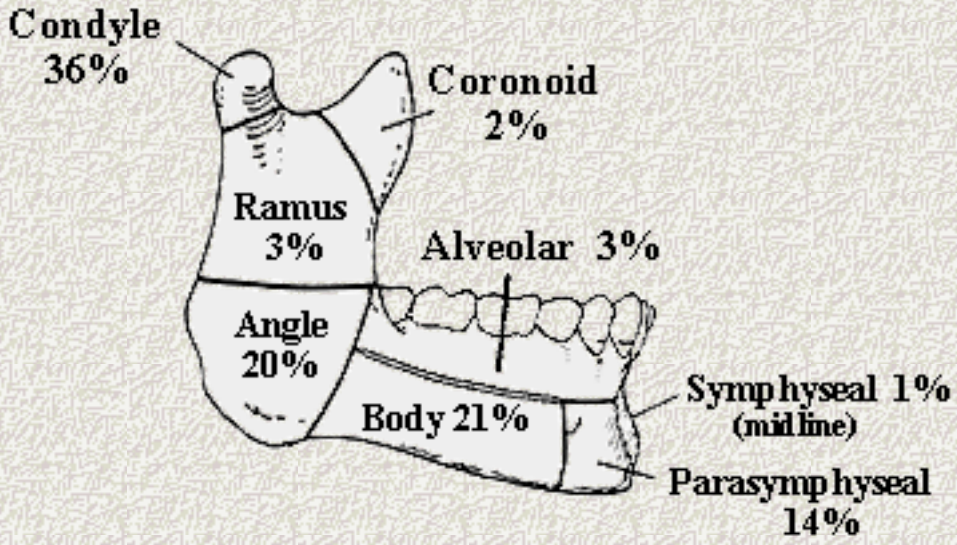
- Diagnosis
  - Clinical
  - "Black eye" - periorbital ecchymosis and edema
  - Cheek depression - may be difficult to detect 2o to swelling, indicates involvement of zygoma
  - Orbital rim step-off
  - Infraorbital hypesthesia
  - Diplopia or entrapment of inferior oblique muscle, due to defect in orbital floor
  - Enophthalmos - orbital floor defect
  - Trismus - zygomatic arch impinging on coronoid process of mandible
- X-rays
  - Waters' view - orbital rim, maxillary sinus
  - Submental vertex to visualize zygomatic arch
  - Frontal (Caldwell) and lateral sometimes helpful
  - CT scan - coronal cuts helpful in identifying orbital floor fracture
- Treatment
  - Indications
    - Functional deficit - trismus or ocular symptoms
    - Cosmetic defect - wait for swelling to subside prior to reduction
  - Reduction - usually requires open exploration and manipulation
    - Blow-out fracture - replace orbital contents and restore floor. May use permanent or absorbable alloplastic implant or autogenous bone graft
    - Orbital rim - same, plus repair rim
    - Trimalar - explore floor if indicated. Fixation by interosseous wiring, external pin, rigid fixation plate or sinus packing

        - Isolated zygomatic arch fracture - Gilles or intraoral reduction.

D. Mandible

- Anatomy
    - Condyle - articulates with skull
    - Coronoid process - under zygomatic arch
    - Angle and ramus - protected by masseter
    - Body - tooth-bearing portion

Illustration demonstrating FREQUENCY OF FRACTURES BY ANATOMICAL AREA

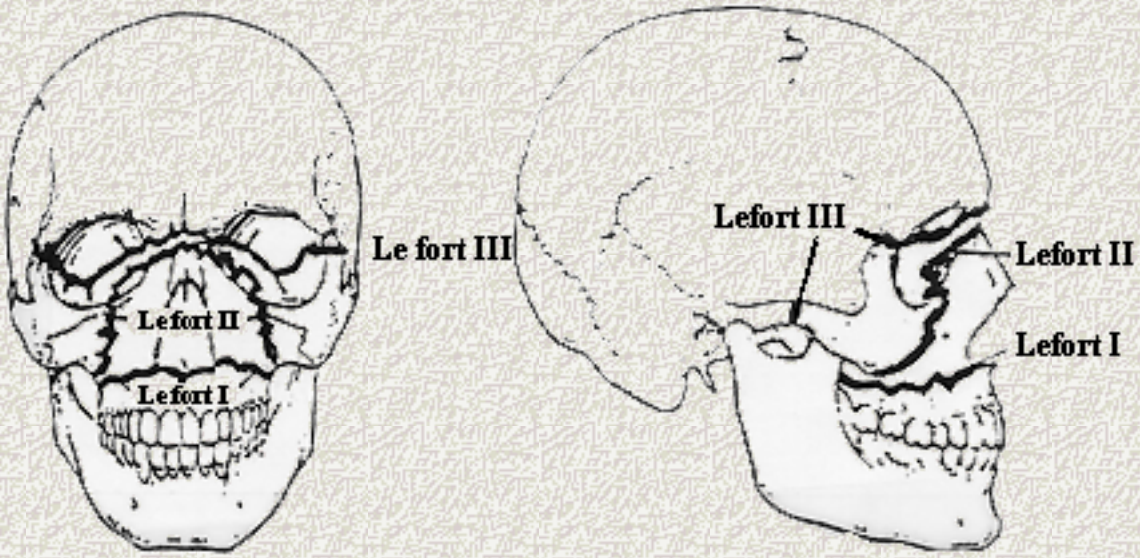


- Diagnosis
    - Clinical
        - Swelling and tenderness
        - Trismus
        - Malocclusion
        - Palpable step-off
        - Intraoral lacerations
        - Mental nerve hypesthesia
    - X-rays
- Treatment
    - Goals of treatment
        - Restore occlusion
        - Avoid nonunion by immobilizing fracture(s) and preventing infection
    - Fixation
        - Interdental wiring
        - Interosseous wiring or plates
        - Intraoral splints

        - External Pins
    - Length of immobilization - depends on age of patient, site and angulation of fracture. Example: Condylar fracture in children - soft diet only. Example: Body fracture in elderly patient - more extensive treatment.
- Important considerations
    - Condyle is the growth center for the mandible. Therefore, injury here in childhood can cause significant deformity.
    - Interdental wiring is potentially hazardous in the non-alert patient. Wire cutters should be kept at the bedside when the patient is recovering from anesthesia, and used to open jaws immediately in case of vomiting or airway problem. Never rely on nasotracheal intubation to reestablish an airway in the presence of intermaxillary fixation.

E. Le Fort Fractures (Mid Face Fractures) - Result from severe frontal blows. Frequently associated with intracranial damage, CSF leak.

- Types of fractures
    - Le Fort I - tooth bearing portion separated from upper maxilla
    - Le Fort II - fracture across orbital floor and nasal bridge (pyramidal fracture)
    - Le Fort III - fracture across frontozygomatic suture line, entire orbit and nasal bridge (craniofacial separation)



    - Combinations common
- Diagnosis
    - "Dishpan Face"
    - Mobile maxilla
    - X-rays - CT scan most helpful axial and coronal cuts
- Treatment

- Postpone until patient neurologically stable and swelling resolved, usually 7 to 10 days
- Rigid fixation plates or IMF and wire upper teeth to next higher stable point
- Splint for palate split

F. Frontal Sinus Fractures

- Anatomy
  - Anterior table - part of forehead and supraorbital rim
  - Posterior table - anterior wall of anterior cranial fossa
  - Inferiorly, the nasofrontal duct drains the sinus into the nose
- Diagnosis
  - Clinical
    - Pain
    - Swelling
    - Ecchymosis
    - Epistaxis or CSF rhinorrhea
    - Associated nasal or skull fractures
  - X-rays
    - Caldwell and lateral skull views
    - Tomograms, CT scan - essential for evaluation of nasofrontal ostia
- Treatment
  - Indications
    - Posterior table fracture
    - Nasofrontal ostia injury
    - Cosmetic defect from displaced anterior table depression
  - Frontal sinus obliteration
    - Exploration of frontal sinus via osteoplastic flap
    - Examine and repair dura if necessary
    - Remove all mucosa from the sinus
    - Fill the sinus with fat to prevent communication with nose and reepithelialization

G. Basilar Skull Fractures

- Diagnosis
  - Conductive and/or sensorineural hearing loss
  - VII paresis or paralysis

    - Hemotympanum
    - CSF otorrhea
- Treatment
    - Observation in NICU
    - Emergency decompression of VII nerve if nerve was noted to be out immediately after injury
    - Reserve surgery for persistent CSF otorrhea; allow adequate time for CSF flow to stop on its own
    - Repair disrupted ossicular chain later

FACIAL LACERATIONS - GENERAL CONSIDERATIONS

- Find all lacerations including those "hiding" in scalp
- Test function of cranial nerves
- Note areas of hypesthesia or anesthesia before using local anesthetic
- Clean wounds thoroughly
- Do not discard any tissue initially
- Restore lips, lids and eyebrows precisely
- Stent injured lacrimal duct
- Repair lacerated nerves accurately in OR
- Establish hemostasis
- Minimize wound tension
- Provide for wound drainage
- Administer tetanus prophylaxis