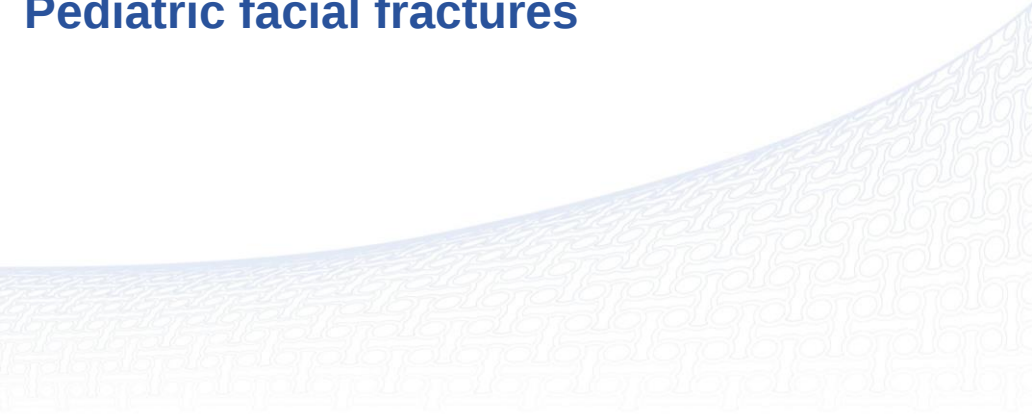


Pediatric facial fractures



Version 2 (December 12, 2018)

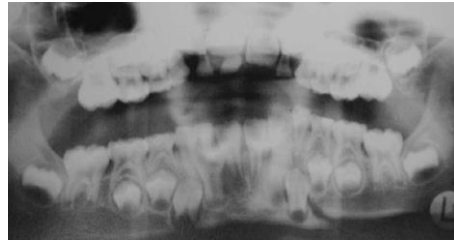
Faculty can add a clinical or imaging picture

Learning objectives

- Describe the unique characteristics of the pediatric facial skeleton
- Describe how treatment options differ from adults

Pediatric fractures

- Different from adult fractures
- Positive:
 - Better blood supply
 - Faster healing and remodeling
 - Greenstick—comminution is rare
- Negative:
 - Small
 - Bone weakness
 - Tooth buds
 - Growth disturbance
 - Arch bars/maxillomandibular fixation (MMF) difficult



Clinical examination

- Often difficult
- History from parents:
 - Be aware of child abuse
- Occlusion difficult to determine
- Unusual patterns:
 - Naturally mobile teeth
 - Cranial fractures



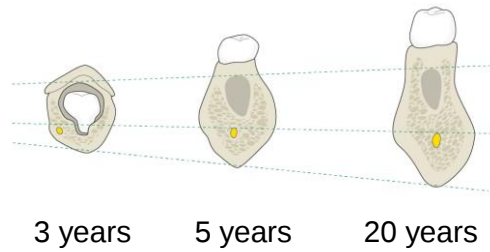
 AOCMF

- Child abuse: child safety concerns especially if history and examination do not match
- Cranium larger as a proportion of the face in younger children therefore higher incidence of cranial/frontal fractures

Mandible

Anatomy changes with age:

- Position of tooth buds
- Inferior alveolar nerve
- Volume of bone



Mandible

Management depends on:

- Fracture characteristics:
 - Displacement/dislocation/mobility
- Patient characteristics:
 - Dental age



 AOCMF

- Mixed dentition—occlusion is not a problem.
- Fracture dislocation of right condyle in an 8-year-old.
- Treat older children like an adult if normal “adult” occlusion, ie, teeth all erupted.

Management options

- Nonoperative
- Operative
 - Closed: dental splints
 - ORIF:
 - Minimal access
 - Osteosynthesis material: titanium or bioresorbable?



Closed methods such as dental splints can be successful (cemented on to the teeth).

ORIF

- Titanium (smaller) plates vs bioresorbable (bigger) plates
- Position screws to avoid tooth germs/roots
- Plan early removal of titanium osteosynthesis to avoid bone overgrowth



- Bioresorbables are bigger screws and plates for the same comparative strength in titanium.
- Also bioresorbables are not without problems—cold abscess, palpability, etc
- Early removal of osteosynthesis to avoid bone overgrowth of the plate (and because it is more difficult to remove later).

Condyle

- Choice of treatment may be controversial
- Remodeling
- Functional adaptation
- Early mobilization:
 - Risk of ankylosis
- Occlusion less important
- Monitor growth after treatment

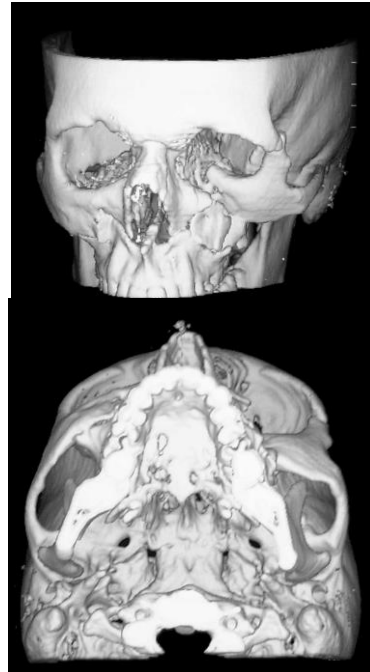


 AOCMF

- Much debate about whether ORIF is indicated.
- Great power for remodeling.
- Risk of ankylosis particularly in head fractures—use of active mouth-opening device or other apparatus.
- Occlusion is much less important because of continued evolution of occlusion.

Midface fractures

- Relatively uncommon
- Greenstick fractures
- Zygoma most common
- Orbital fractures:
 - Trapdoor entrapment
 - Early treatment



- Zygoma fractures may be able to be reduced without the need for fixation (greenstick).
- If ORIF required, use small plates.
- Orbital fractures—mechanism of injury leads to trapdoor that opens and then closes and traps soft tissue. Early treatment is important to avoid long-term scarring, etc.

Cranial vault fractures

- Frontal sinus absent at birth, starts to form from 2 years onward
- Skull thickness increases with age
- Small plates or bioresorbable
- Early removal of titanium osteosynthesis material



 AOCMF

- Frontal sinus fractures managed differently than in adults.
- Not easy to harvest outer table in very young children.
- Early removal of osteosynthesis material to avoid plates being buried or going inside the skull as it grows (and to avoid potential growth disturbance).

Take-home messages

- Fractures in children differ from fractures in adults
- Fractures heal quickly
- Minimal fixation
- Early removal of titanium osteosynthesis material
- Follow-up to monitor growth



- Pediatric fractures are not just small adult fractures.
- Minimal fixation and remove metalwork early, otherwise it will be enveloped in bone.