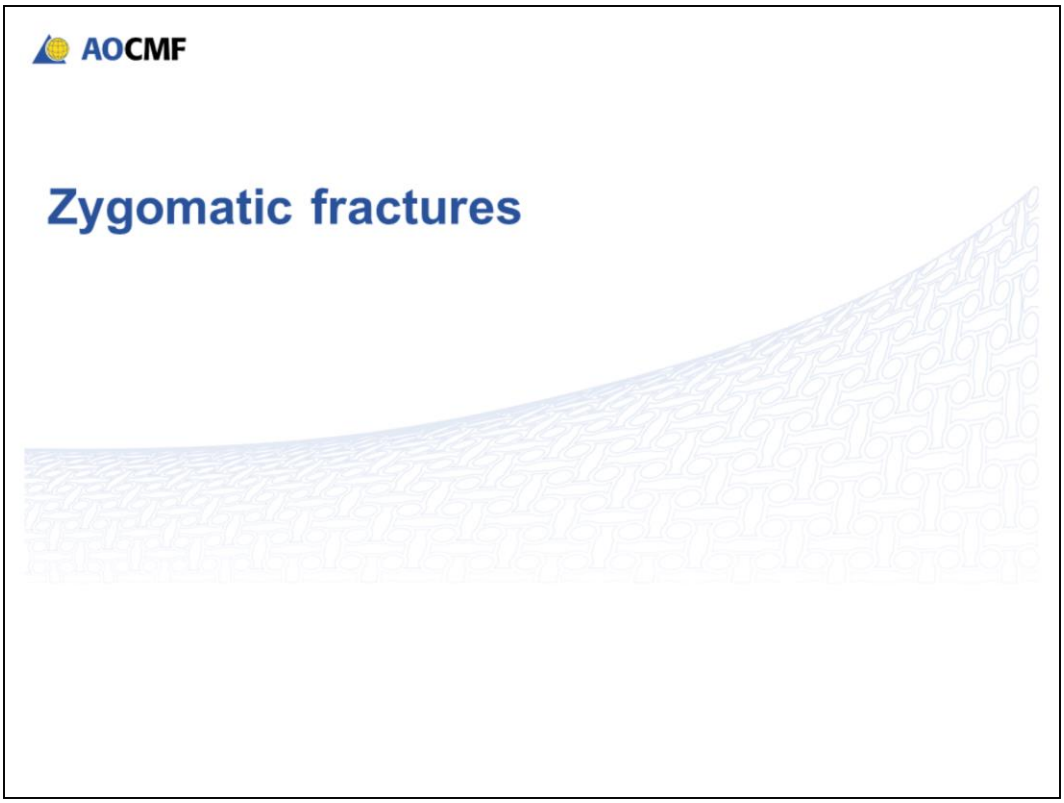

Version 2 (December 12, 2018)

Faculty can add a clinical or imaging picture of a zygomatic fracture

Learning objective

- Describe the mechanism of injury for different types of zygomatic fractures (including orbitozygomatic fractures)
- Recognize signs and symptoms of zygomatic fractures
- Select appropriate imaging modalities and interpret the findings
- Formulate principles of management

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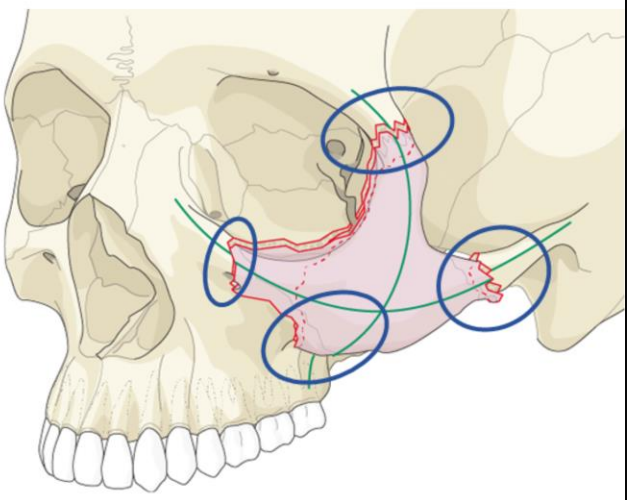
Zygomaticomaxillary complex (ZMC) fracture

- All four buttresses involved:
  - Frontozygomatic
  - Infraorbital rim
  - Zygomaticomaxillary
  - Zygomatic arch
- Always an orbital component:
  - Lateral wall
  - Orbital floor



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Clinical findings

- Facial asymmetry:
  - Facial width and cheek flattening
- Periorbital ecchymosis ± crepitus
- Infraorbital nerve numbness
- Lateral canthal dystopia
- Trismus

- Restricted range of motion of globe
  - Diplopia
- Occlusal disorder

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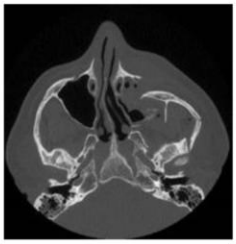
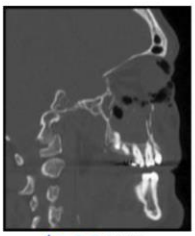
Important to assess vision with formal ophthalmological evaluation

Diagnosis

- CT scan:
  - Axial, coronal, sagittal
- Need to assess buttresses looking for:
  - Comminution
  - Displacement
- Assess orbital floor





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Management

Guided by CT imaging:

- Degree of fracture displacement
- Single vs multiple fragments
- Comminution of buttresses
- Status of orbital floor
- Status of nasoorbitoethmoidal (NOE) complex

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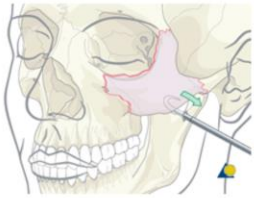
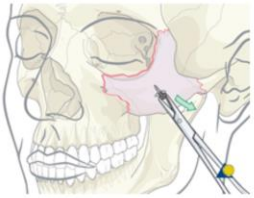
If it occurs with an NOE fracture, important to treat both to reestablish the orbital rims and correct volume.

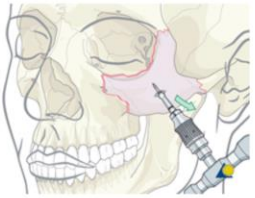
Options for reduction of zygomatic fracture



Bone hook

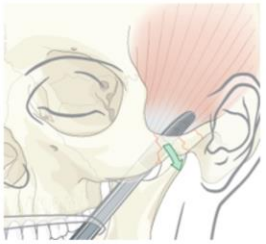


Screw and traction



Threaded reduction tool

Temporal approach



Intraoral approach

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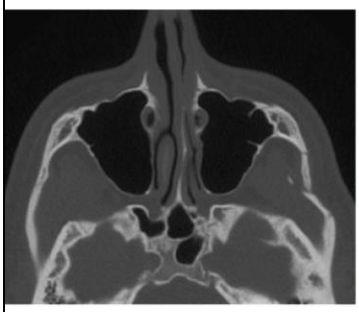
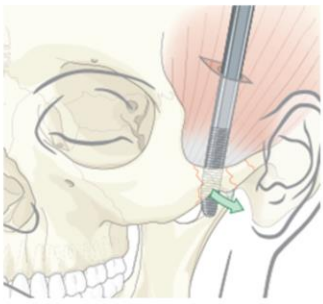
Remind participants of the importance of checking the reduction of the spheno-zygomatic suture

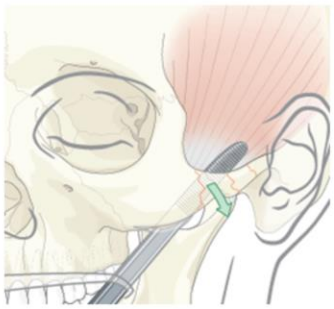
Isolated zygomatic arch (not ZMC fracture)

Frequent comminution with inward displacement at mid arch:

- Localized contour deformity
- No orbital component
- Usually elevation only with no fixation







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Decisions for management

- How many buttresses to expose?
- When is a coronal approach necessary?
- Comminution and outward displacement
- How many fixation points?
  - 0, 1, 2, 3, or 4?
  - Often dictated by comminution and severity
- When to explore the orbital floor?
  - Often when fractures extend medial to infraorbital nerve and fat herniation is seen
  - Restriction of ocular motion

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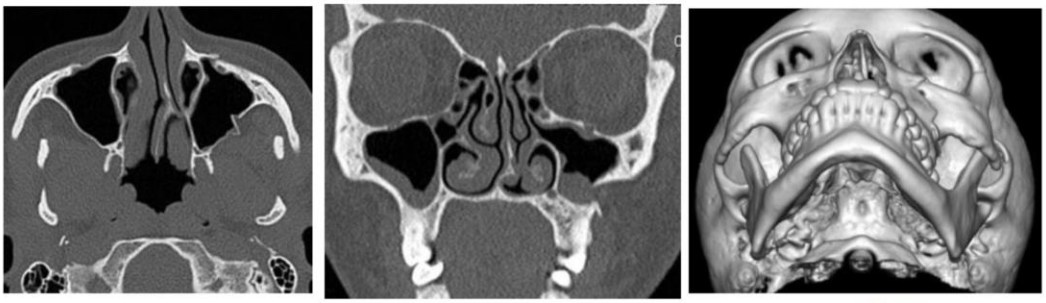
Fixation

Single-point fixation:

- Usually at zygomaticomaxillary buttress:
  - Minimally displaced fracture with rotation
  - No displacement at FZ suture or lateral wall
  - Simple fractures



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Two-point fixation:

- Frontozygomatic and zygomaticomaxillary buttresses:
  - Comminution may be present at one but not both buttresses
  - Where there is no indication for orbital floor exploration

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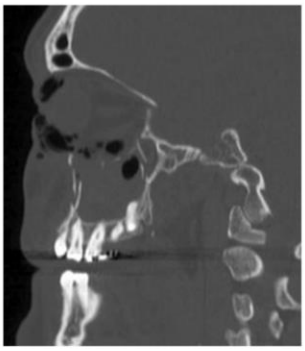
Three-point fixation:

- FZ buttress, ZM buttress, and infraorbital rim:
  - Comminution of buttresses, often outwardly displaced arch
  - High-velocity injury with loss of soft-tissue support
  - Need for orbital floor exploration





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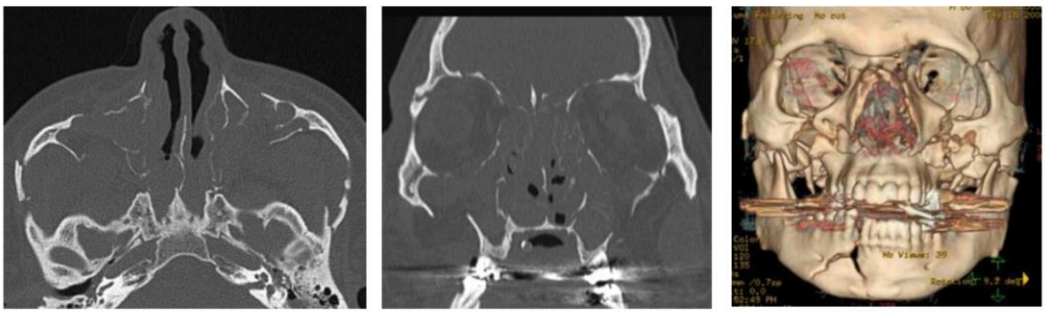
Four-point fixation:

- FZ buttress, ZM buttress, infraorbital rim, and zygomatic arch:
  - Displaced and/or comminuted fractures with loss of anatomical reference points
  - Panfacial fractures



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Note for faculty:

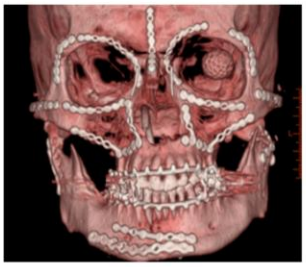
4-point fixation is unusual for an isolated zygomatic fracture

Fixation options

1-point fixation

2-point fixation

3-point fixation



4-point fixation

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Take-home messages

- Zygomatic fractures comprise various patterns
- Base treatment on trauma energy and CT analysis
- Precise anatomical reduction and stabilization is the goal to reduce secondary deformities

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