Proximal Humeral Fracture Management
Advanced Principles for ORP

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high failure / revision rate
Displacement of fracture fragments is common due to muscle attachments
Problems of Proximal Humerus fracture

Multifragmentary:

- How to achieve good reduction and stable fixation

![X-rays of shoulder joint](image)
Osteoporosis: How to maintain reduction?

Young Patient

Old Patient
If all attachments are disrupted
There is risk of AVN: Avascular Necrosis

AVN

M. supraspinatus
M. subscapularis
M. pectoralis major
Imaging

X Ray: Trauma Series

AP

Lateral scapular

Axillary
CT & 3 D reconstruction is useful to determine extent of head fracture.
Indication for **Non Operative** treatment

- Non displaced fracture
- Stable fracture in two views
Indication for **Non Operative** treatment

- Non displaced fracture
- Stable fracture in two views
79 years old female
Indication for **Non Operative** treatment

- Very old pt. with underlying neurological, stroke, unable to use that arm

Have to accept Stiffness and limitation of ROM
Indication for Surgery

Unstable fracture
Irreducible dislocation
Displaced and rotation of head fragment
  Tuberosities are displaced more than 5 mm.
  Shaft fragment(s) are displaced more than 20 mm.
  Head fragment angulation is greater than 45°.
2-Part Fracture: Percutaneous pinning
Complication of Pinning

Unstable Joint penetration

Stiffness
2- part: Percutaneous screw fixation?

28y, F
Canulated Screws fixation
Osseous sutures

Unstable
Poor results
These plates are not designed specific to the proximal humerus Fx.
Implant Anchorage in osteoporotic Bone
Positioning
28 Years old soldier, Motorcycle accident
Unstable Fracture Dislocation
Temporary fixation of fragments and tendons with sutures
Bicipital groove 5 mm.
Plate positioning &
Temporary fixation of plate by K-wires
Fix proximal with screws
Reduce the distal to the plate
fixation of plate to the shaft
Locking screws fixation
tendons and fragments are fixed with sutures
4-part fracture

80 years old female
Complications

Impingement
Complications

Screw penetration

Varus and Malalignment
Malposition of the plate
Malalignment
Locking screw backed out
65 years old female
4 parts fracture of prox. humerus after fell down from the stairs
one week ago
72 years old female with 4-part fx.dislocation?
Prosthetic replacement

- Elderly patient
- Osteoporosis
- Comminuted fracture
  - not reconstructable
- Impaction of articular surface
  (> 40 %)
Conclusions

Diagnosis: X rays AP/Lateral + CT scan

Indication for ORIF

- Displacement of fragments > 1 cm.
- Angulation of fragments ≤ 45°
- Greater Tuberosity: displace up ≤ 0.5 cm.
Conclusions

Pinning in adult:
- complications + poor result

Screws only: in some cases

LCP is now the gold standard.
Conclusions

- Reduction + Plate position: Important
- Suture helps reduction
- K wires are needed for tempo fix
- Good plate position helps reduction or shaft
- Don’t forget to tie sutures to plate
Thank You