Anatomy & classification of Proximal humerus fractures

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3% of all upper extremity fractures

**Majority (80%)**:  
1. Undisplaced  
2. Elderly  
3. Low Energy

**Minority (20%)**:  
1. Displaced  
2. Young  
3. High Energy
Anatomy
Anatomy
Kocher classification

(Modified from Kocher T: Beitrage zur Kenntnis einiger praktisch wichtiger Fracturenformen. Basel: Carl Sallman Verlag, 1896.)
Deforming forces in proximal humeral fractures

From Copeland: Operative Shoulder Surgery
Neer classification

(based on displacement of fragment)

Criteria: displacement >1 cm or angulation >45°

4 part fx
The greater the number of displaced fragments, the higher the risk of AVN.
Reliability/Utility of Neer Classification

- interobserver and intraobserver reliabilities
  - kappa value (0 – 1)

- interobserver reliability ➔ 0.21 - 0.64
- intraobserver reliability ➔ 0.5 - 0.8

correlation between the Neer classification and clinical outcome scores

AO classification
(based on location of fracture)

proximal humerus (11-):
Type A extra-articular unifocal
Type B extra-articular bifocal
Type C articular

AO Principles of Fracture Management.
Chap 1.4; Thieme, New York 2000
The Neer and AO-ASIF classifications

- low reproducibility and reliability specially in 3 or 4 parts, if assess by X-ray


(Hertel et al)
The length of the dorsomedial metaphyseal extension and integrity of the medial soft tissue more important than number of "parts" and degree of displacement in development of osteonecrosis
Hertel’s Binary or Lego description system for proximal Humerus fractures
Unusual pattern of fx

Classification ?
age as the most important prognostic after operative fixation
Problems in old patients

- Missing med support
- Osteoporosis
- Healing potency

Failure of treatment
Conclusion

- **Common Fx in elder patients**
  - Consider anatomical points
- **Neer classification**
  - a useful framework for clinical assessment
- **pattern of fracture displacement**
  - affect prognosis
- **Age of patient**
  - important in prognosis

Thank you for attention