**Upper Limb Fractures**

**In general, causes of UL fractures:**

- **Young:** high energy trauma
- **Old:** low energy (falls), FOOSCH, osteoporotic

**Clavicle fractures:**

- **Most common sites:** middle (80%) > distal (15%) > proximal (5%)
- Look for **skin tenting** -> results in open fracture by perforating the skin or creating a necrotic area
- **X-ray:** AP, 45° cephalic tilt (shows sup\inf displacement)
- **NVS** (brachial plexus) of the UL runs below the clavicles -> evaluate it!
- **Treatment:**
  - **Non-operative:** if non-displaced -> sling
  - **Operative:** ORIF w\plate & screws more commonly, IM nailing
    - **Absolute indications:** open fractures, neurovascular
    - **Relative indications:** skin tenting, shortening of 2 cm, 100% displacement, interfragmentary piece, ligament injury

**Shoulder dislocations:**

- **Anterior:** *(most common)*
  - **MOI:** abduction, extension, ext rotation of the arm
  - **O/E:** pt’s arm will be abducted and externally rotated (can’t internally rotate), “squared off” shoulders
- **Posterior:**
  - **MOI:** 3E’s: epileptic seizures, EtOH, electrocution
  - **O/E:** pt will present w\the arm locked in internal rotation (can’t externally rotate)
- **Inferior:** aka “luxatio erecta” *(rare)*
  - **O/E:** pt will be in saluting position

- **Clinical evaluation:** apprehension test, axillary N exam (sensory patch over deltoid + abduction)
- **Hill-sachs lesion:** indentation of humeral head against glenoid edge
  - **Anterior** dislocation -> Hill-sachs in the **back**
  - **Posterior** dislocation -> Hill-sachs in the **front**
- **Bankart lesion**: tear in the labrum of the glenoid rim -> associated w\ high recurrence rate of shoulder dislocations esp in young pts. While in elderly, shoulder dislocations are associated w\ rotator cuff tears

- **X-ray:**
  - “True” AP view
  - Axillary view -> lateral arm abduction (*most imp, esp to dx post dislocation*)
  - Trans-scapular Y “Mercedes-Benz sign”
  - Hill-sachs (done after 2-3 wks, not acutely)

- **Treatment methods**: kocher’s (*method of choice*), traction-countertraction, Stimson (hanging the arm), Hippocratic method

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### PROXIMAL HUMERUS FRACTURES:

- **Neer classification**: a part is a piece w\:
  - > 1 cm displacement
  - > 45° angulation
- Anatomic neck is closer to the head -> higher incidence of AVN
- Examine the **axillary Nl**!

- **What’s the difference of an impression fx and Hill-sachs? **Position.** Impression fx is directly on the articular surface which indicates a high energy mechanism, Hill-sachs is either post or ant

- **Treatment**:
  - *Non-minimally displaced*: sling immobilization for 2-3 wks
  - *Two or three-part fracture*: ORIF
  - *Four-part fracture*: ORIF in young, hemiarthroplasty in elderly
**HUMERAL SHAFT FRACTURES:**
- Examine the radial N!
- Treatment:
  - **Non-operative:** initially sugar tong\hanging cast followed by Sarmiento functional brace 2 wks later
  - **Operative:** ORIF (open fx, neurovascular, unacceptable alignment, segmental, obesity):
    - Plate & screws most commonly

**DISTAL HUMERAL FRACTURES: HOLSTEIN-LEWIS FRACTURES:**
- May entrap or lacerate radial N (fix it even if no radial N sx)

**FOREARM FRACTURES:**
- Contralateral X-ray are a must esp in bone loss? to recreate the normal side while fixation: alignment, length, and rotation -> it becomes your template
- **How to check rotation?** Supination\pronation
- Ulna can be negative, positive, neutral

**ULNA: NIGHTSTICK:**
- Isolated ulnar fx w\out radial head dislocation
- Direct blow to forearm -> holding up arm to protect face

**ULNA: MONTEGGLIA:**
- Prox ulnar fx + radial head dislocation (PRUJ injury)
- **Bado classification:**
  - **Type I:** anterior radial head dislocation
  - **Type II:** posterior radial head dislocation
  - **Type III:** lateral radial head dislocation
  - **Type IV:** both ulna and radius are fractured

**RADIAL: GALEAZZI:**
- Distal radial fx + DRUJ dislocation
- **Reverse Galeazzi:** ulnar fx + DRUJ dislocation
- **MOI:** FOOSH on pronation
DISTAL RADIAL FRACTURES:

- Most common upper limb fx
- Clinical evaluation: check ipsilateral elbow and shoulder, carpal tunnel syndrome

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<tr>
<th>COLLE’S FX</th>
<th>SMITH’S FX</th>
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| • falling on hyperextension  
• dorsal angulation  
• apex volar  
• dorsal displacement | • falling on flexed wrist  
• volar angulation  
• apex dorsal  
• volar displacement | • Fx w\ either dorsal or volar displacement  
• the whole wrist displaces w\ the fractured piece | • Fx of the radial styloid  
• AP X-ray shows intact lunate facet (unlike barton’s) |

- **X-ray:** **AP** (radial inclination and radial length) + **lateral** (volar tilt)

- **Treatment:**
  - **Non-operative:**
    - Manual closed reduction under hematoma block
    - Traction w\ finger traps -> ulnar deviation volar flex to max length of radius to use the force on the radial column
    - Sugar tong, full circular cast
  - **Operative:** if open fx, neurovascular, failed closed reduction, loss of reduction
SCAPHOID FRACTURES:

- Most common carpal bone fx
- **Site**: waist > proximal (worst prognosis, highest risk of AVN) > distal
- MOI: hyper-extended + radially diverted wrist

**Clinical evaluation:**
- **Dorsally**: snuff box tenderness
- **Volarly**: scaphoid tubercle tenderness
- Pain w\ resisted pronation
- **X-ray**: AP, lateral, scaphoid-specific views (wrist ext w\ ulnar deviation -> shows fx in a clear line)

**Blood supply:**
- **Dorsal**: radial A -> dorsal carpal branch (80%, retrograde)
- **Volar**: radial A -> superficial palmar branch (20%)

**Treatment:**
- **Non-operative**: usually non-displaced -> long-arm thumb spica cast for 4 wks then short arm cast until radiological evidence of healing (2-3 mo)
- **Operative**:
  - Minimal displacement -> percutaneous fixation w\ headless (countersink) screw
  - Severe displacement, humpback deformity -> ORIF w\ headless (countersink) screw

➢ **If the pt’s presenting w\ a clinical picture of scaphoid fracture but no radiological signs?**
Manage it as scaphoid fx. Bc it might be a hairline fx which doesn’t appear until 2-3 wks when bone resorption happens, so treat as scaphoid fx and repeat X-ray 2 wks later to r\o fx. (or do CT from the beginning and you can see it clearly)

**References:**
- Dr. Khalid Alsheikh’s lecture
- Toronto notes
- Orthobullets