

Common Adult Fractures Upper Limb

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Objectives

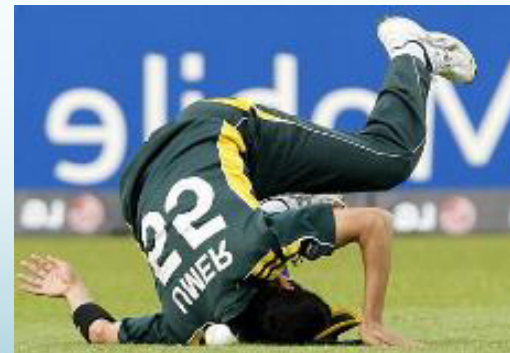
- Identify common upper limb fractures in adults
 - Presentation, diagnosis, management, and important considerations
 - Clavicle
 - Humerus
 - Forearm
 - Wrist
 - Hand

Clavicle Fracture

- One of the commonest of all fractures
- Etiology
 - Direct
 - Indirect trauma:
 - Fall onto outstretched hand or on the shoulder
 - Birth newborn injury following a difficult delivery (present as pseudo-paralysis)



<https://musculoskeletalkey.com/clavicle-fractures-4/>



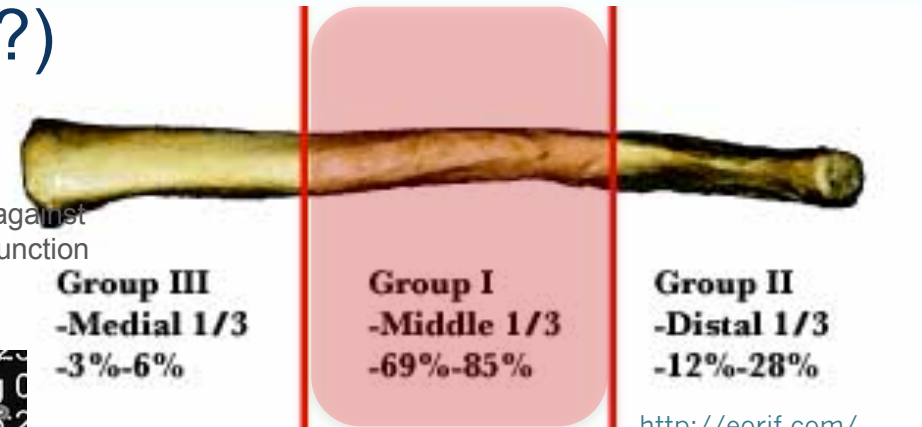
http://www.safefall.net/injuries_sports.html



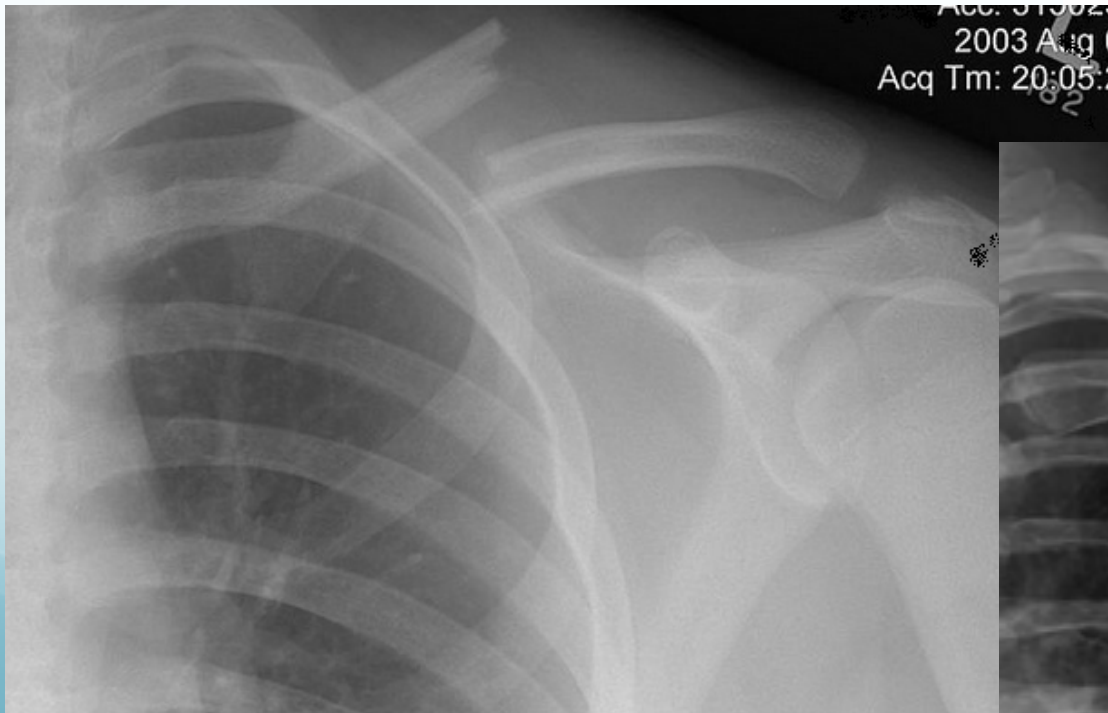
Clavicle Fracture

- Sites:
 - Lateral thirds,
 - Middle thirds, , common (why?)
 - Medial thirds

Its weakest point. The lateral fragment is depressed by the weight of the arm against trapezius, thus the shoulder droops, it is pulled medially forward by adductor function of pectoralis major causing the bone fragments to override.



<http://eorif.com/>



Clavicle Fracture

- Clinically;
 - Pain
 - Swelling
 - deformity
 - Loss of motion



Clavicle Fracture: Management

- Non or minimal displaced: Typically conservative: heals well
 - Figure-of-eight brace (bandage)
 - Or Shoulder sling holding the elbow to overcome gravity



Clavicle Fracture: Management

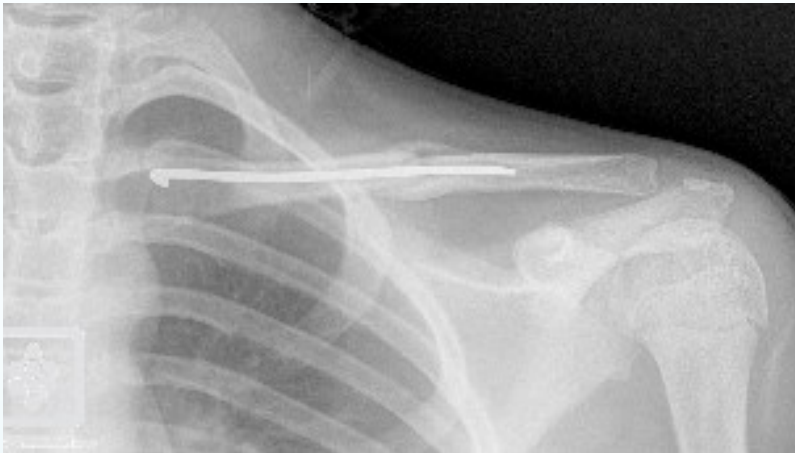
- Surgical indications:
 - Vascular compromise
 - Open fractures
 - Comminuted fractures with (Z-shaped) fragment
 - Floating shoulder
 - Severe displacement
 - Tenting of the skin
 - Patient's preference
 - (Athlete, active)



Clavicle Fracture: Management

- Surgical Treatment

- ^{↑ Prediction} ~~ORIF~~ ^{Fixation} by Plate and Screws (standard)
- ^{Open} ~~Elastic~~ ^{Internal} nail ?



Clavicle Fracture – Complications of surgery

- Infection
- Neurovascular injury
- Pneumothorax
- Non union
- Hardware prominence
- Poorer cosmeses

Fracture Humerus

- Proximal end

1.1

- Mid shaft

1.2

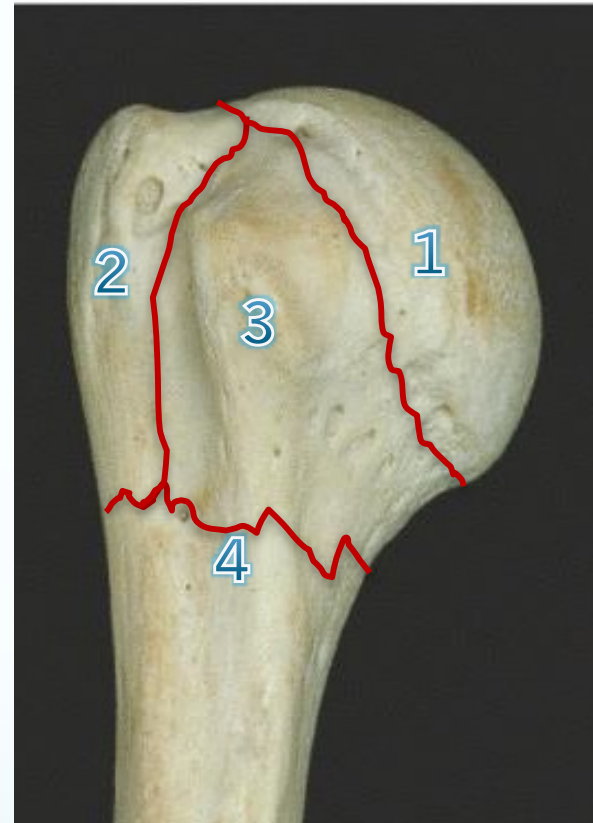
- Distal end

1.3



Proximal end fracture

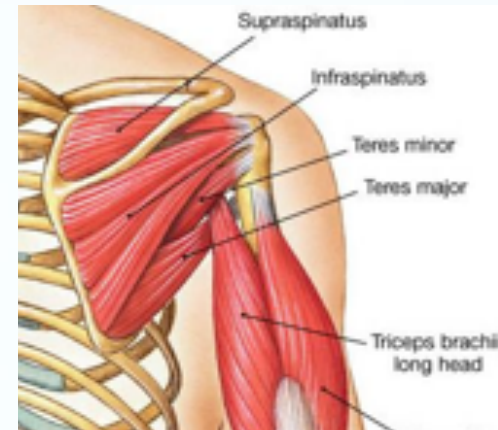
1. The head
2. Greater tuberosity
3. Lesser tuberosity
4. Surgical neck



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Greater Tuberosity

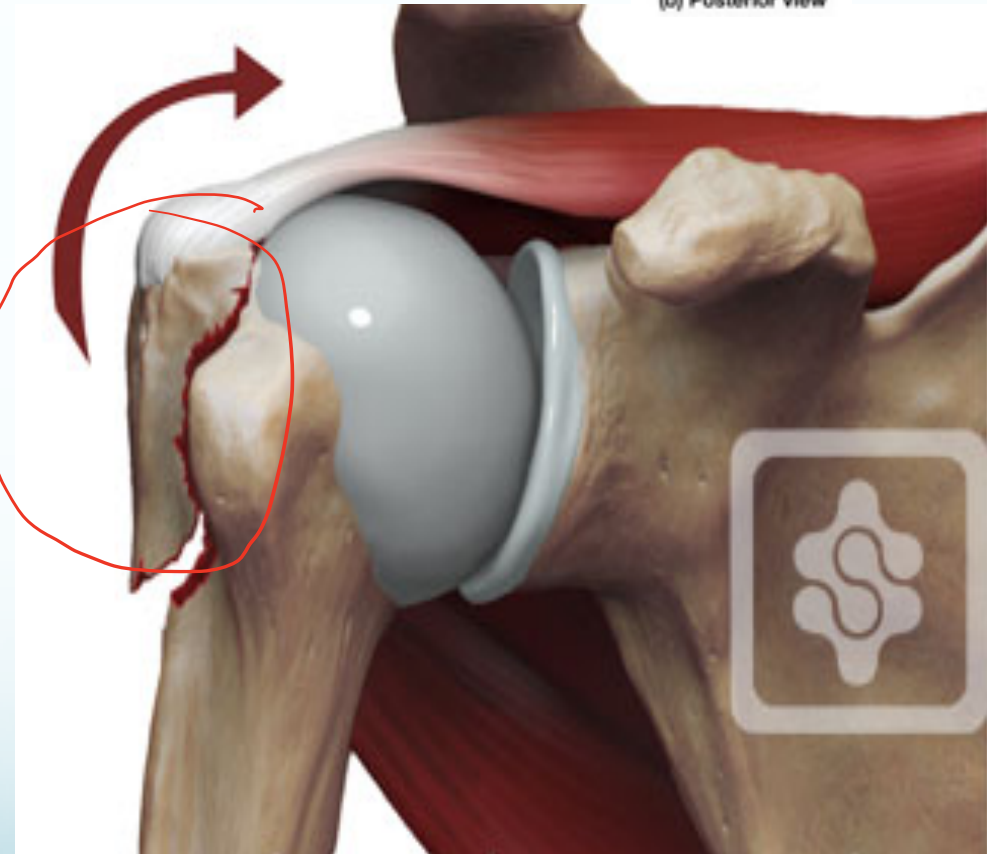
- Provides attachment to:
 - Supraspinatus, infraspinatus, Teres Minor



(b) Posterior view

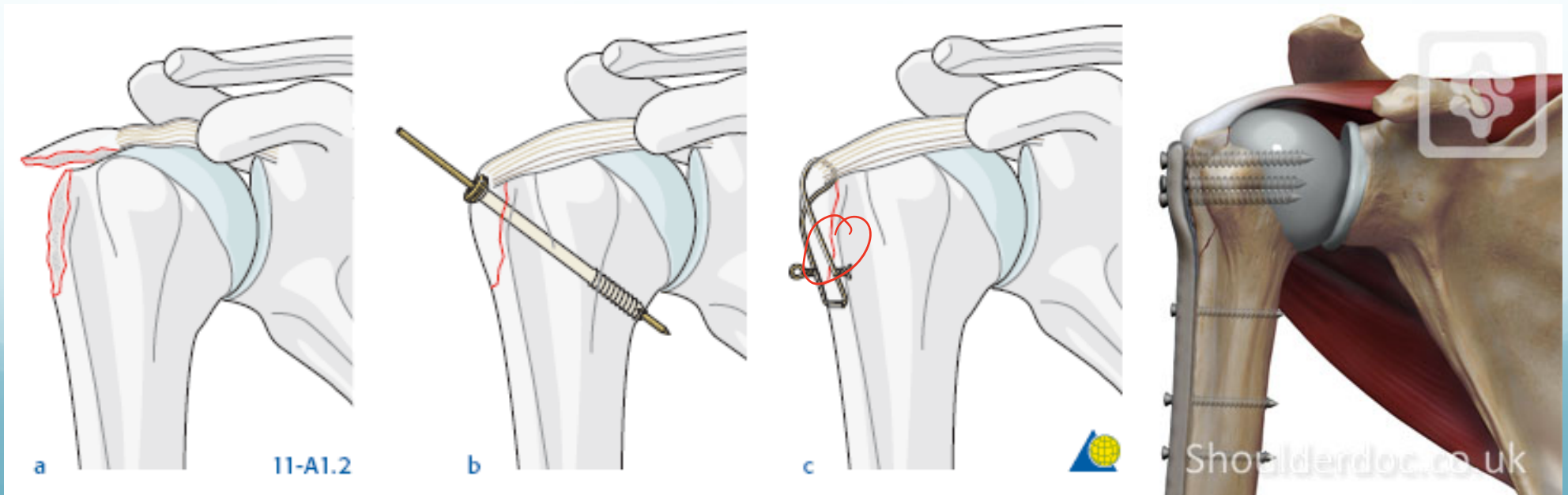
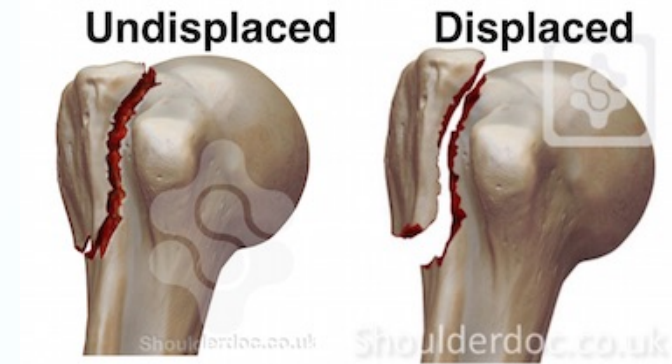


Avascular



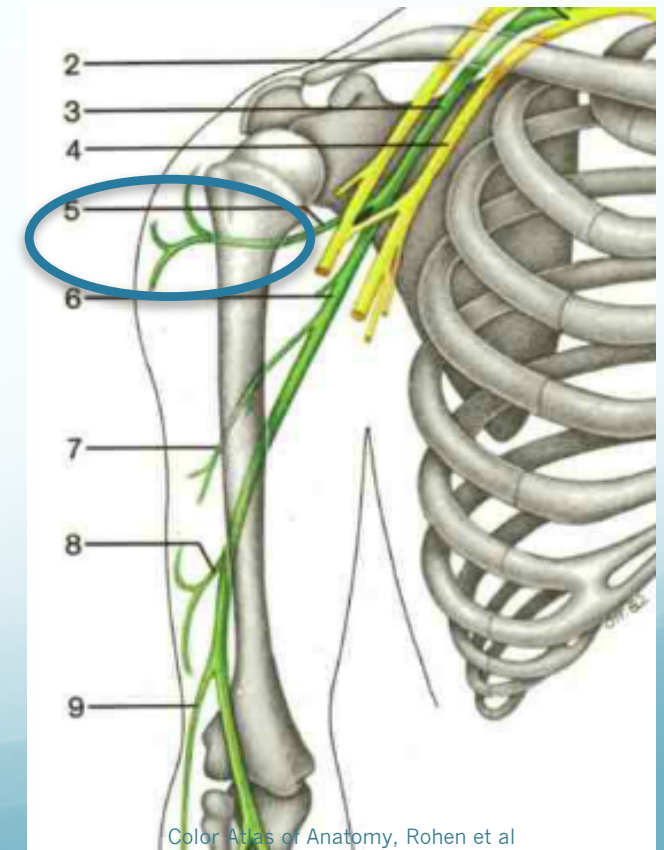
Greater Tuberosity

- Management:
 - Minimally/non displaced:
 - conservative Sling
 - Severely displaced: internal fixation
 - By screws / tension band / plate
 - To regain function of rotator cuff



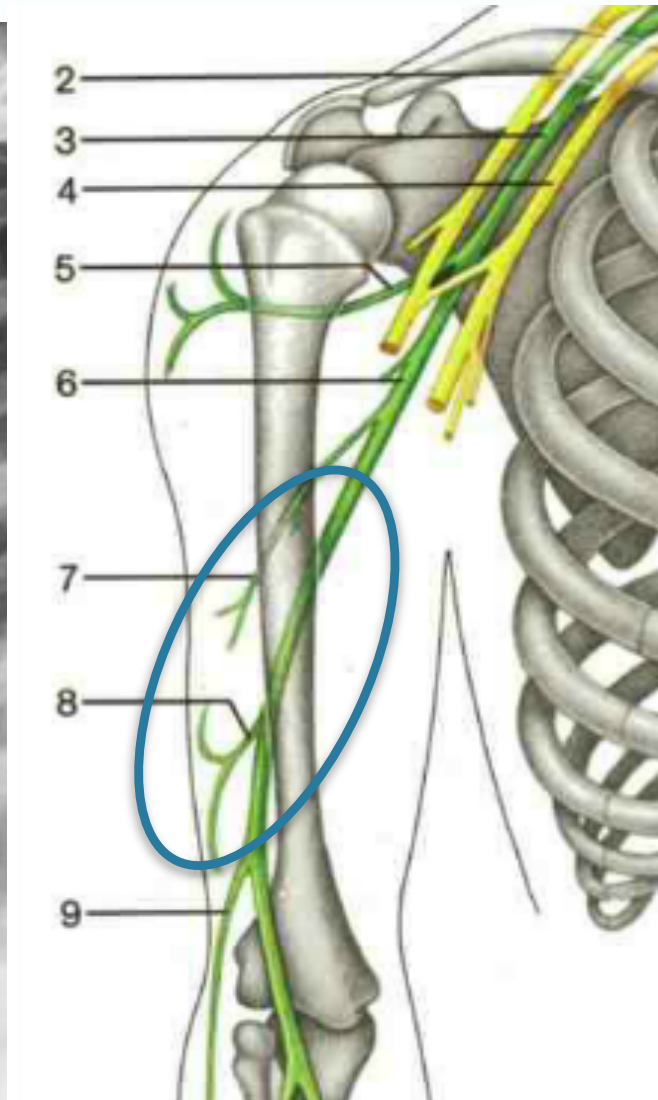
Surgical Neck- Problem

- If osteoporotic bone
 - Difficult fixation
- Possible associated injury to Axillary nerve
 - Motor: Deltoid
 - Sensory: upper lateral arm



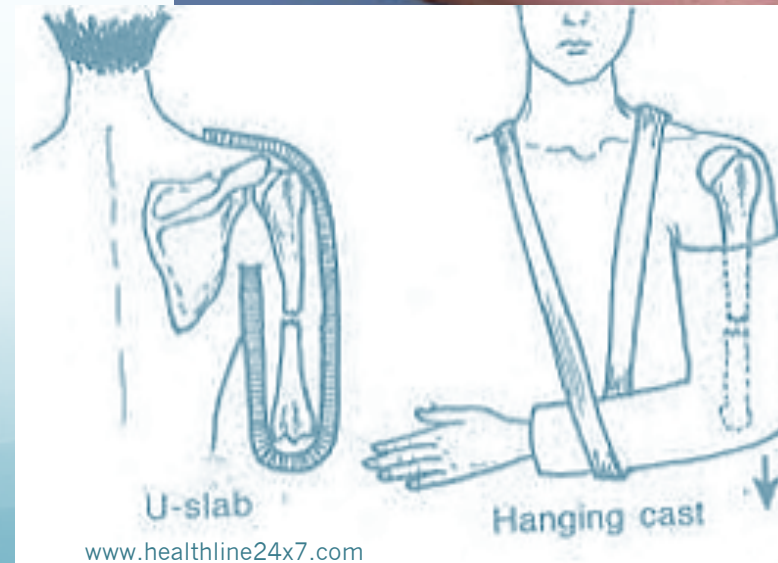
Humeral Shaft Fracture

- Possible associated injury to The Radial nerve (why?)(signs?)



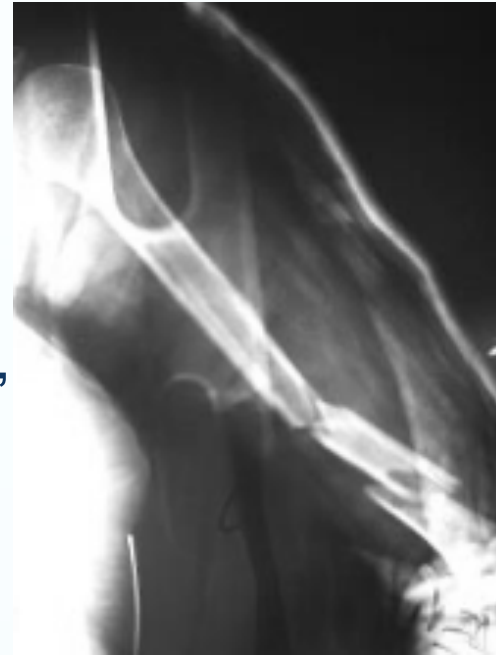
Humeral Shaft Fracture- Management

- Conservative: U-shape slab) / splint / orthosis
 - Gravity maintains reduction



Humeral Shaft Fracture

- Management:
 - Operative: (plate or IMN)
 - Indications:
 - Sever displaced Unreduced,
 - Bilateral,
 - multiple injuries
 - floating elbow,
 - Needs to use crutches
 - Patients' preference (active, athlete)



Fracture Distal Humerus

- Treated by open anatomical reduction and internal fixation by plates and screws
 - Early mobilization to prevent elbow stiffness



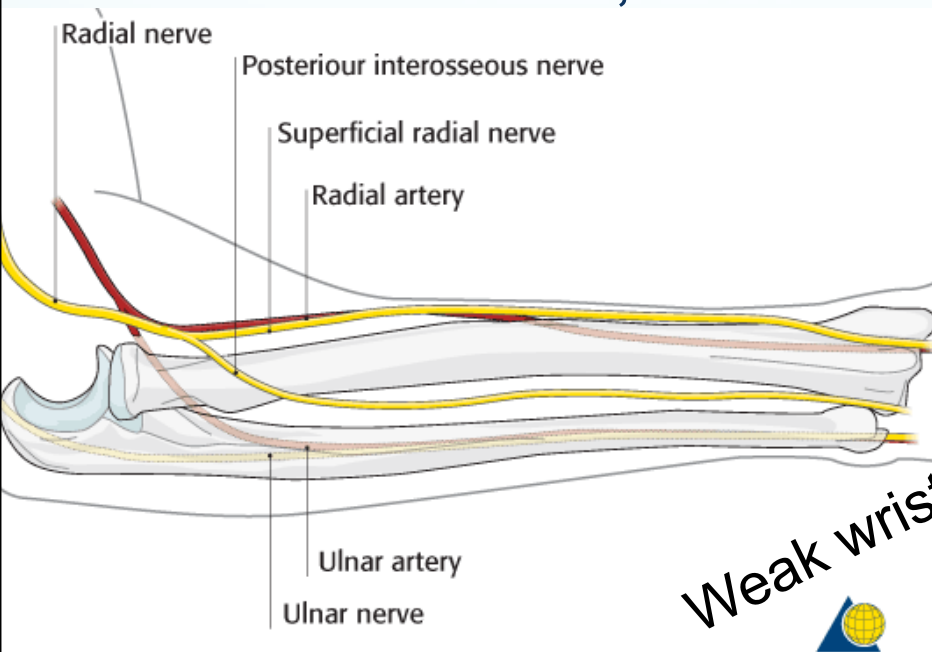
Fracture Radial Head / Neck

- Clinical Presentation:
 - Pain at elbow
 - Localized swelling
 - Inability to supinate/pronate. Might still be able to flex/extend elbow slightly



Possible Associated Injury

- Examine the wrist:
 - For disruption of the distal radio-ulnar joint
- The posterior interosseous nerve
 - damaged by the initial injury or by the surgery performed to treat the fracture
 - Therefore, document functional status preoperatively



Weak wrist extensors



X-ray

- A visible posterior fat pad on the lateral view of the elbow is a sign of occult intra-articular trauma



<http://cdn.lifeinthefastlane.com/>



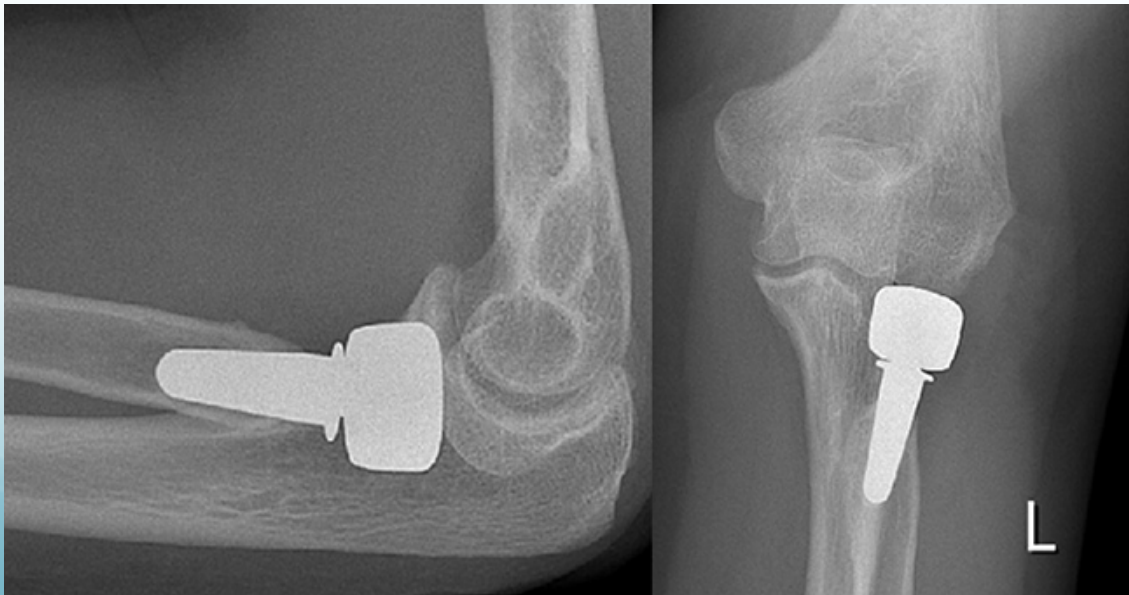
<https://www.aafp.org>

Fracture head / neck of radius

- Management In Minimal head displacement:
 - Conservative treatment
 - Cast above elbow & sling
 - Early motion to minimize elbow stiffness

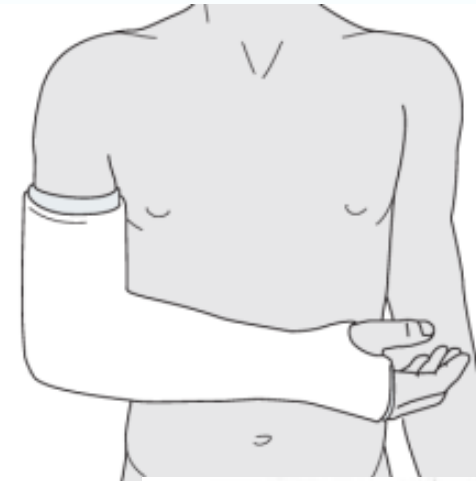
Fracture head / neck of radius

- Management if the fracture involves more than 33% of the articular surface or is severely displaced
 - Surgical treatment:
 - ORIF if possible
 - Radial head Replacement if comminuted /inoperable



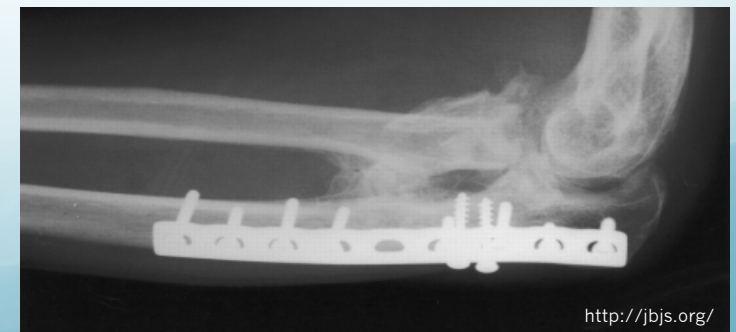
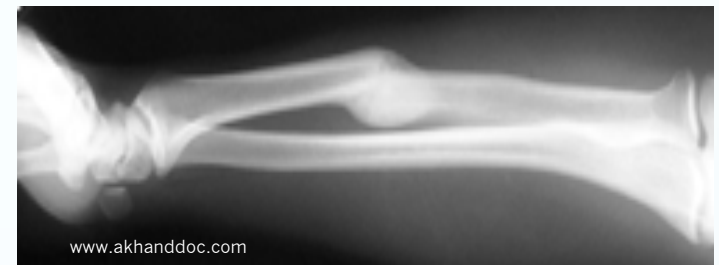
Forearm Fractures

- (Considered as a joint)
- Management:
 - Undisplaced:
 - Possible conservative – cast & follow up
 - Displaced:
 - Anatomical Open reduction and internal fixation by Plating and screws(best fixation)
 - Early motion - Prevents stiffness



Forearm fractures - Complications

- Compartment Syndrome
- Neurovascular injury
- Infection in open # or postop
- Mal-union (if treated conservatively)
 - loss of supination/pronation
- Nonunion
- Posttraumatic radioulnar synostosis (3- 9%)



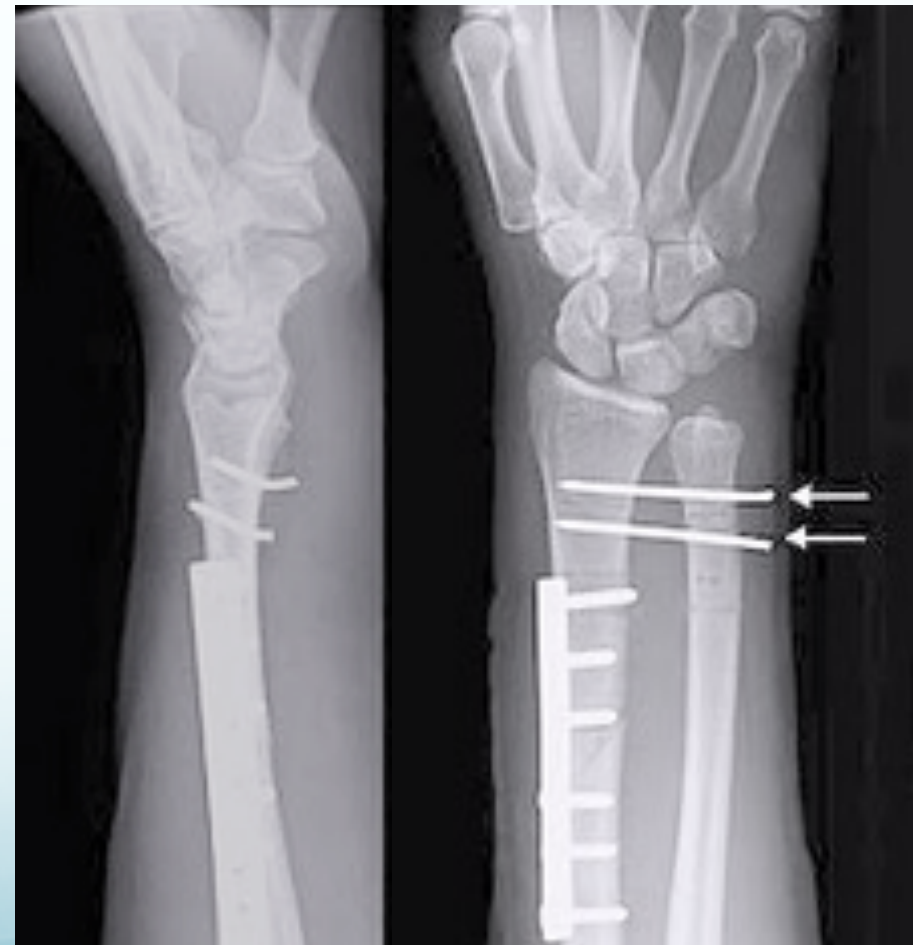
Galeazzi Fracture/ Dislocation

- Fracture of the radius with dislocation of the distal radio-ulnar joint
- “Fracture of necessity”
 - Necessitates surgery



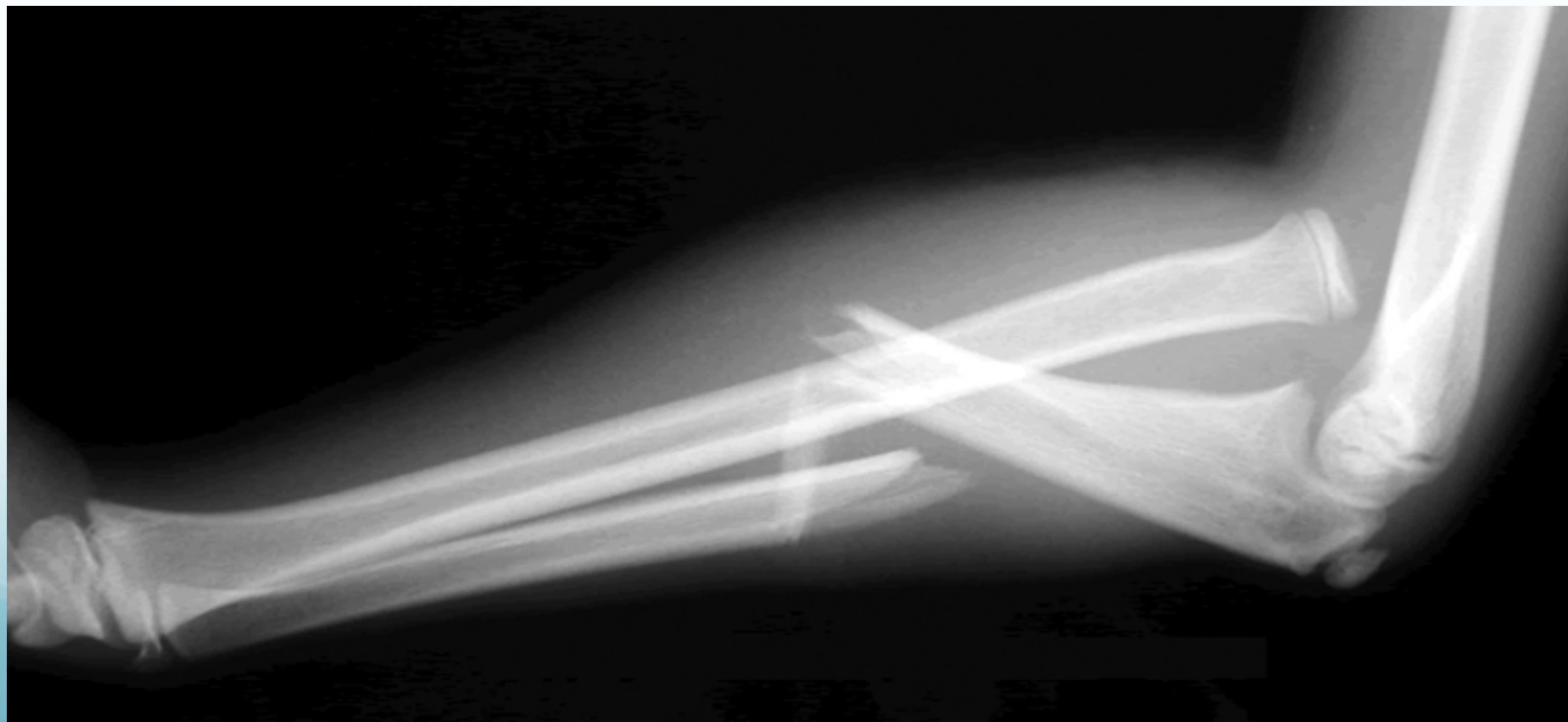
Galeazzi Fracture/Dislocation

- Fracture of the radius with dislocation of the distal radio-ulnar joint
- “Fracture of necessity”:
 - Necessitates surgery
 - Plating of radius
 - Reduction of distal radio-ulnar joint (+/- Fixation)



Monteggia Fracture/Dislocation

- Fracture of the proximal third of the ulna with dislocation of the head of the radius
- Dislocated head of radius missed if two joints are not included on the x-ray



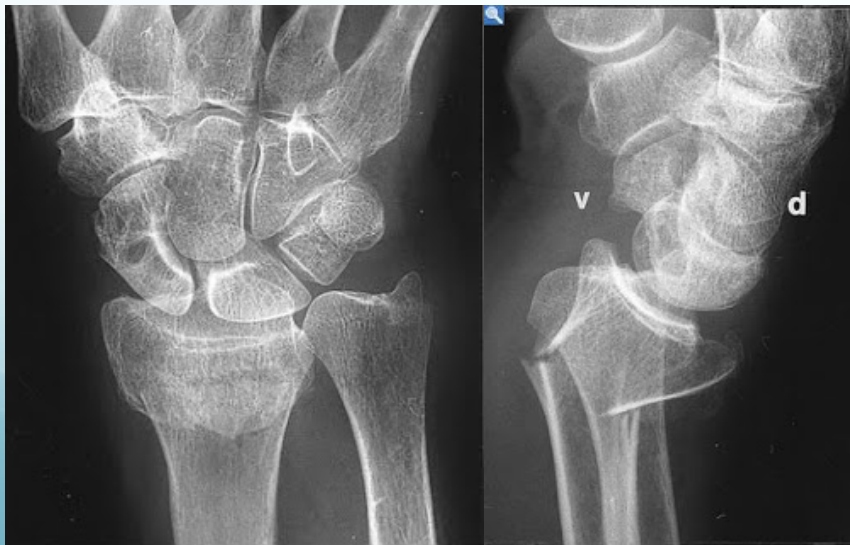
Monteggia Fracture/Dislocation

- Fracture of the proximal third of the ulna with dislocation of the head of the radius
- “Fracture of necessity“. Treated by:
 - Open reduction and internal fixation of ulna
 - Closed reduction of head of radius
 - +/- fixation



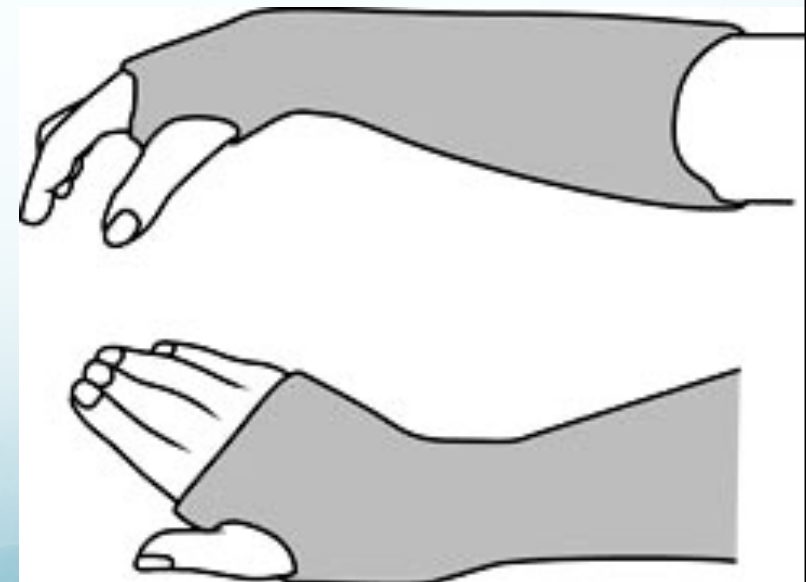
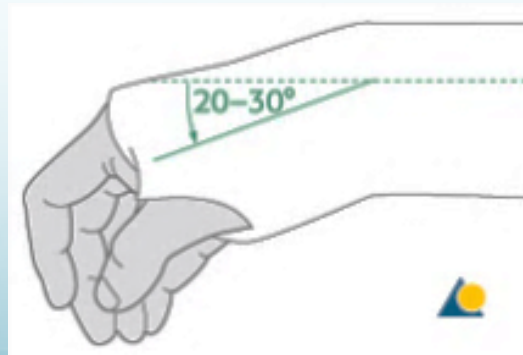
Colle's Fracture

- Extra-articular fracture of the distal radius with dorsal and radial displacement of the wrist
“Dinner fork” deformity
- Seen in elderly with osteoporosis
- Caused by falling on the outstretched hand



Colle's Fracture - Treatment

- Undisplaced : Cast alone
- Displaced: (Sedation/ UGA / ULA), closed reduction, casting
Wrist immobilized in flexion & ulnar deviation



Intra-articular Distal Radius Fracture

- treated by anatomical open reduction, internal fixation and early mobilization



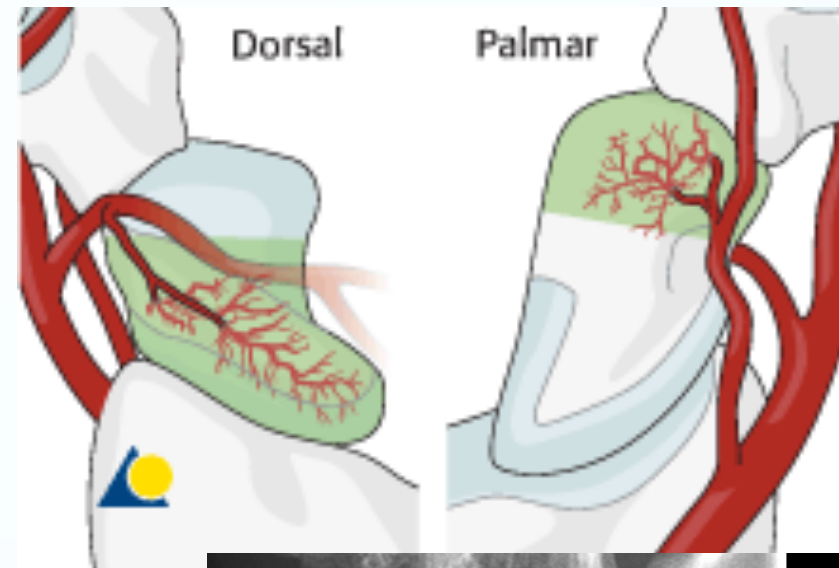
Scaphoid Fracture

- Scaphoid is the common fractured carpal bone
- Fall on the palm of the outstretched hand
- Presents with pain , tenderness in the anatomical snuffbox



Scaphoid Fracture

- Blood supply comes from distal to proximal
- Avascular necrosis (AVN) common with proximal 1/3 fracture
- **Radiology:**
 - AP and Lateral not enough
 - Need an special scaphoid view



Scaphoid Fracture

- Complications
 - Avascular necrosis (AVN):
 - Mainly proximal 1/3 fracture
 - Non-union:
 - In undiagnosed or undertreated scaphoid#
 - Wrist osteoarthritis
 - A result of non-union and AVN



www.handcarecenter.com



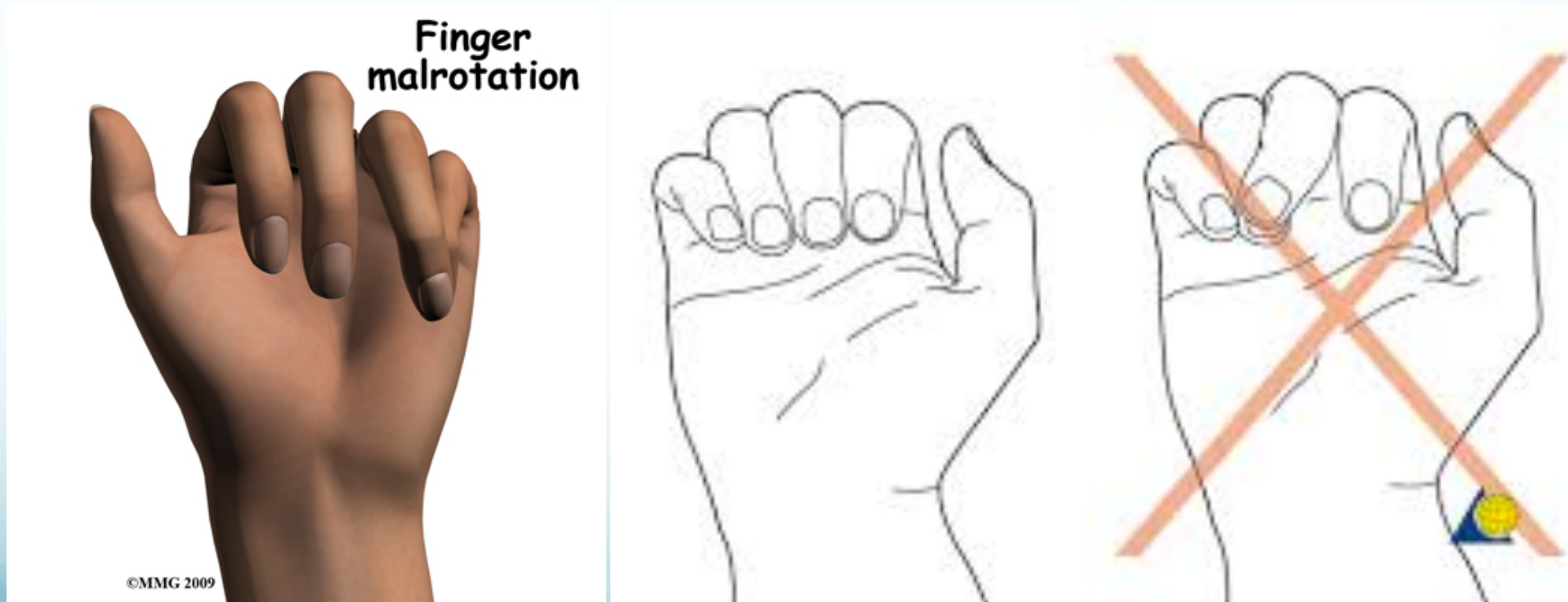
Scaphoid Fracture - Treatment

- Not all fractures are apparent initially in image, If tenderness is present:
 - Treat by thumb Spica cast
 - Repeat x ray after 2 weeks
- Non / minimally displaced waist & distal fractures
 - Short arm thumb Spica
 - Extend to 16 weeks depending on fracture location
- Displaced and proximal fractures
 - Internal fixation with special screw



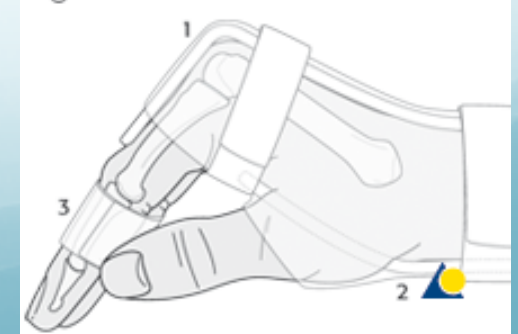
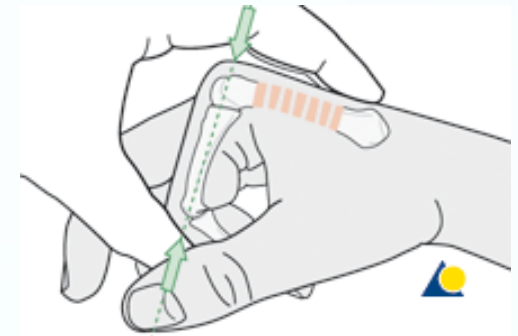
Metacarpal Fractures

- Careful about rotational malalignment
 - Check rotation by flexing the fingers



Metacarpal Fractures

- Undisplaced / or only one MC
- Treatment by cast / or splint



Metacarpal Fractures

- Displaced / Rotated / Multiple
 - Treated by internal fixation (screws / plates / wires)



<http://orthoinfo.aaos.org/>



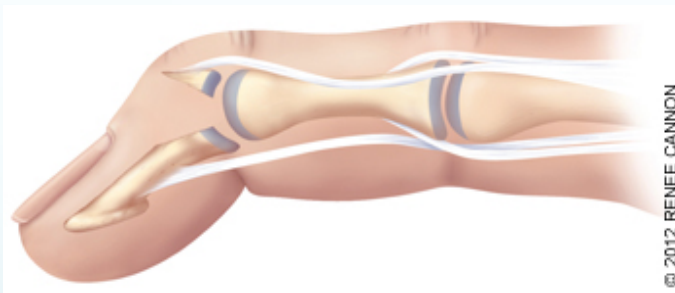
jhs.sagepub.com



<http://www.drdomaino.com/>

Mallet Finger

- Avulsion injury of extensor tendons insertion to distal phalanx
- Mechanism of injury
 - Sudden forceful flexion (e.g. ball hits tip of finger)

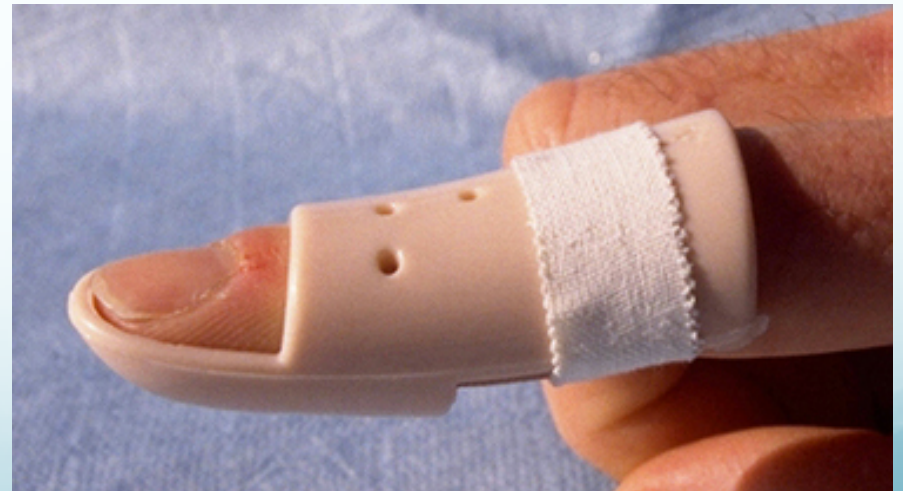


Mallet Finger

- Clinical picture
 - Flexed distal IP joint
 - Loss of active extension of DIP joint
- Treatment
 - Mallet finger splint
 - Internal fixation if avulsed bone is large



www.emedicinehealth.com



Summary

- Upper limb injuries are common
- Clavicle: usually heals well
- Humerus: Radial nerve
- Elbow: Stiffness
- Head of radius: fat pad sign, posterior interosseous nerve
- Forearm: a joint
- Distal radius: intra-articular / Extra-articular (old age)
- Scaphoid: AVN
- Metacarpals: Rotation