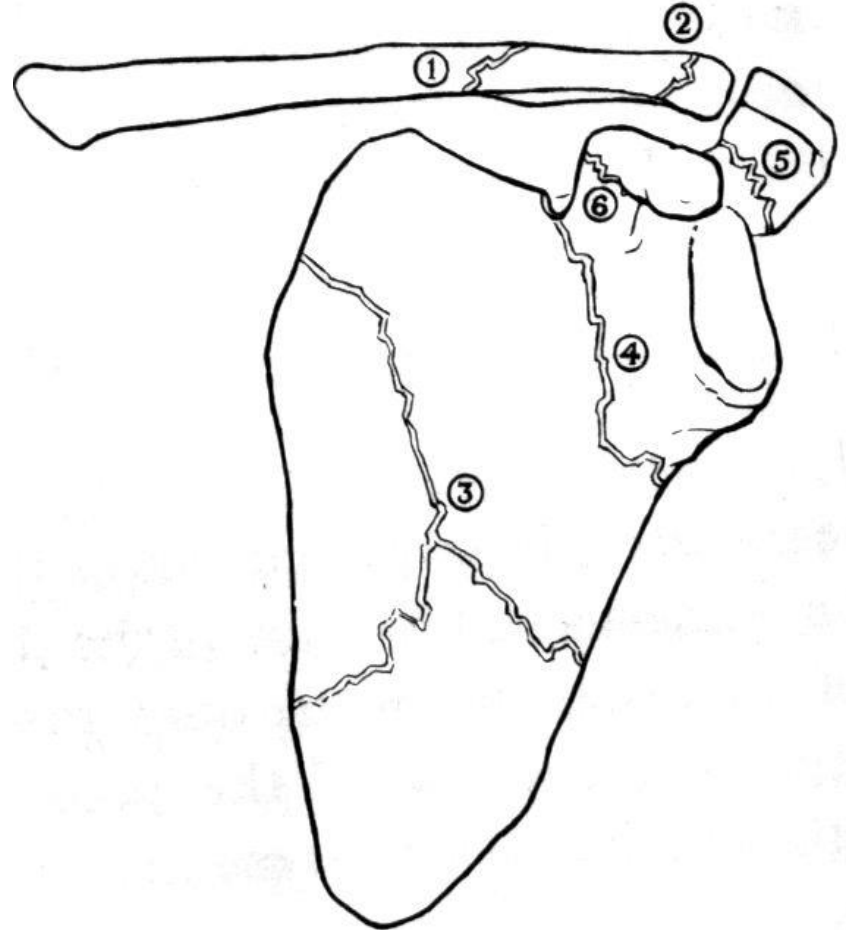


Injuries of the Upper limb

Dr. Isam Ali, PhD .

Fractures of The Shoulder Girdle

- 1 - Fr. of the Clavicle : junction of the middle and outer thirds
- 2 - Fr. of the lateral end of Clavicle
- 3 - Fr. of body of scapula
- 4 - Fr. of neck of scapula
- 5 - Fr. of acromion process
- 6 - Fr. of coracoid process



Fractures of the Clavicle

- Most fractures result from direct blow on the point of the shoulder; generally from a fall on the side .
- Less commonly ,force may be transmitted up the arm from a fall on the out stretched hand .
- Sport , road traffic .

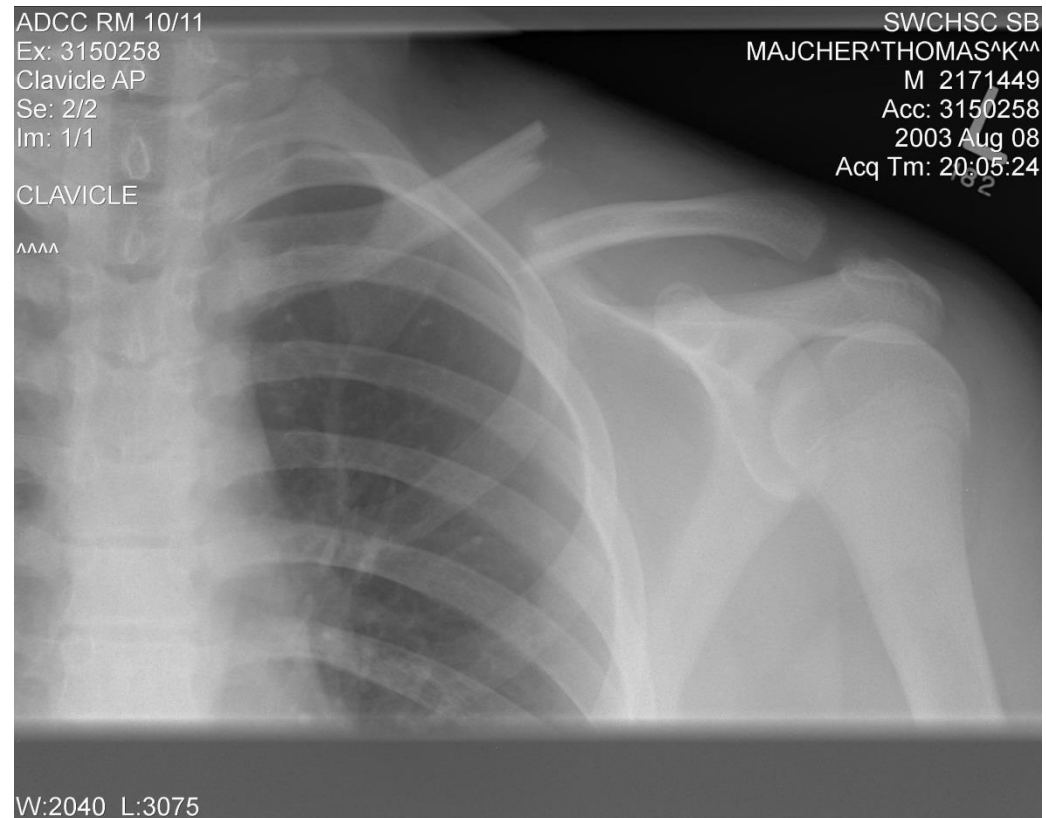
Fractures of the Clavicle

- The commonest site : junction of middle and outer thirds.
- Also common site: throughout the middle third.
- Less common site : the outer end .



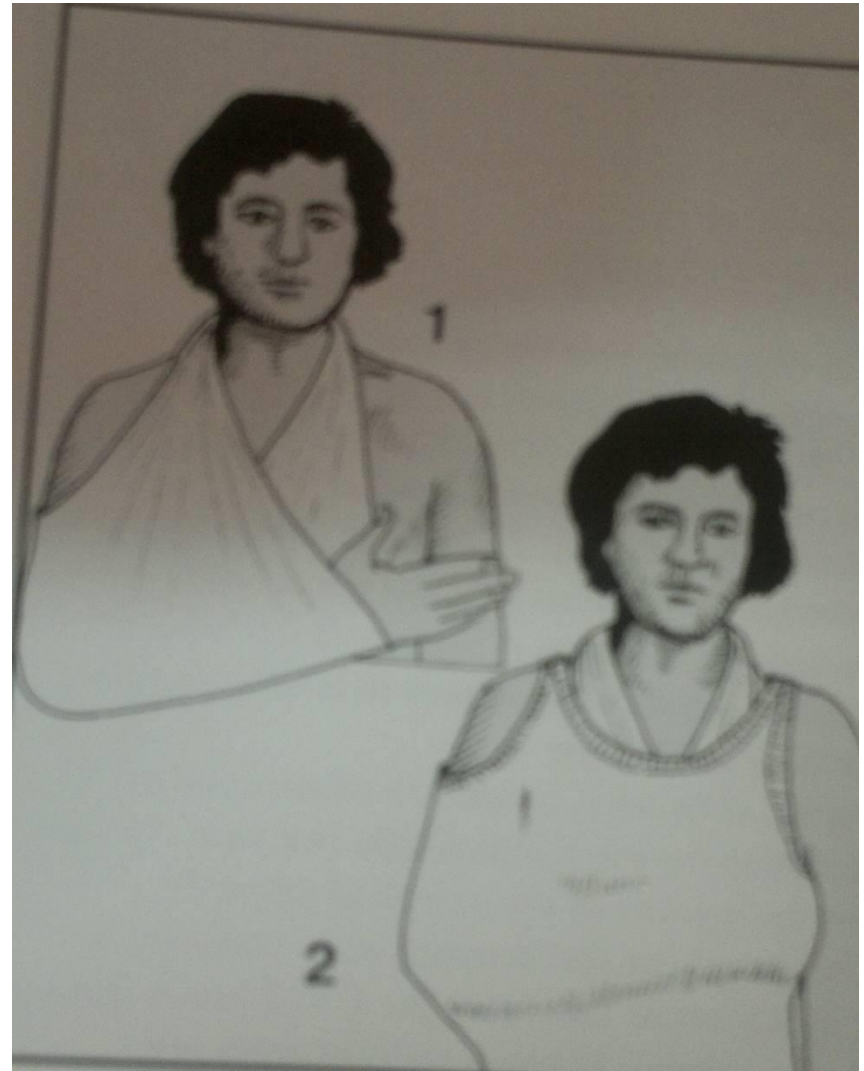
Fractures of the Clavicle

- **Displacement :**
usually, the lateral
fragment goes
downwards and
medially .



Treatment :

- Sling : for the relief of pain, for 2-3 weeks .
- Exercises should be practiced from an early stage especially in old persons.



Treatment :

- Figure-of-eight Bandage
In cases of marked displacement.
- may Causes obstructions of the venous return or injuries of the nerve trunk .

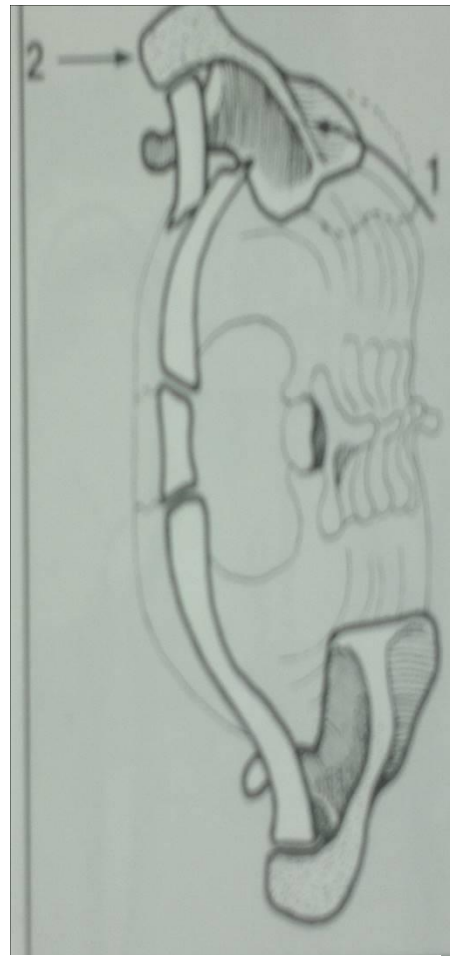
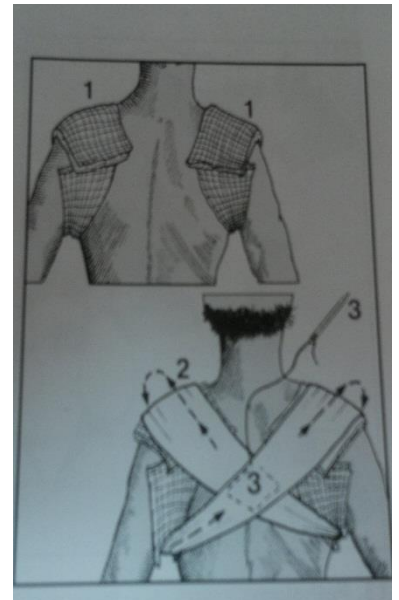
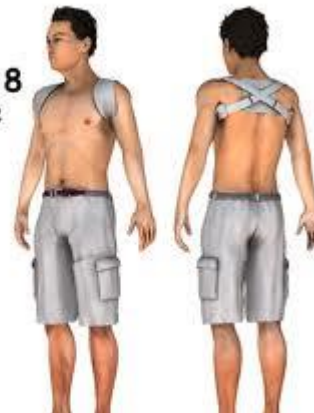


Figure 8
brace



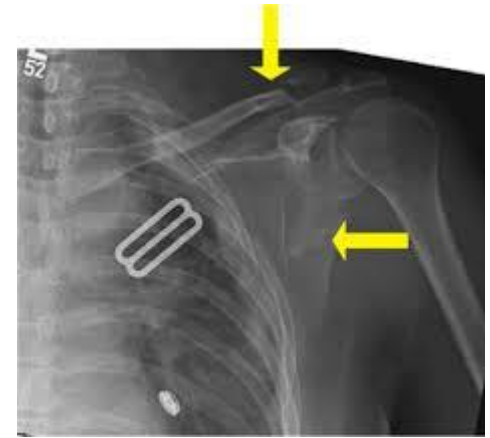
Treatment :

- Moderate displacement should be accepted
- Residual disability :
a palpable or visible irregularity of the bone.
- In Children :
Remodeling restores normal contour.
- Indication of internal fixation is limited.



Fracture of the Scapula

- By direct injury .
- Uncommon and unimportant.
- Might cause severe pain or extensive extravasation of blood into tissues .
- Sling might be used when necessary .
- Operation might be indicated according to the site and displacement.



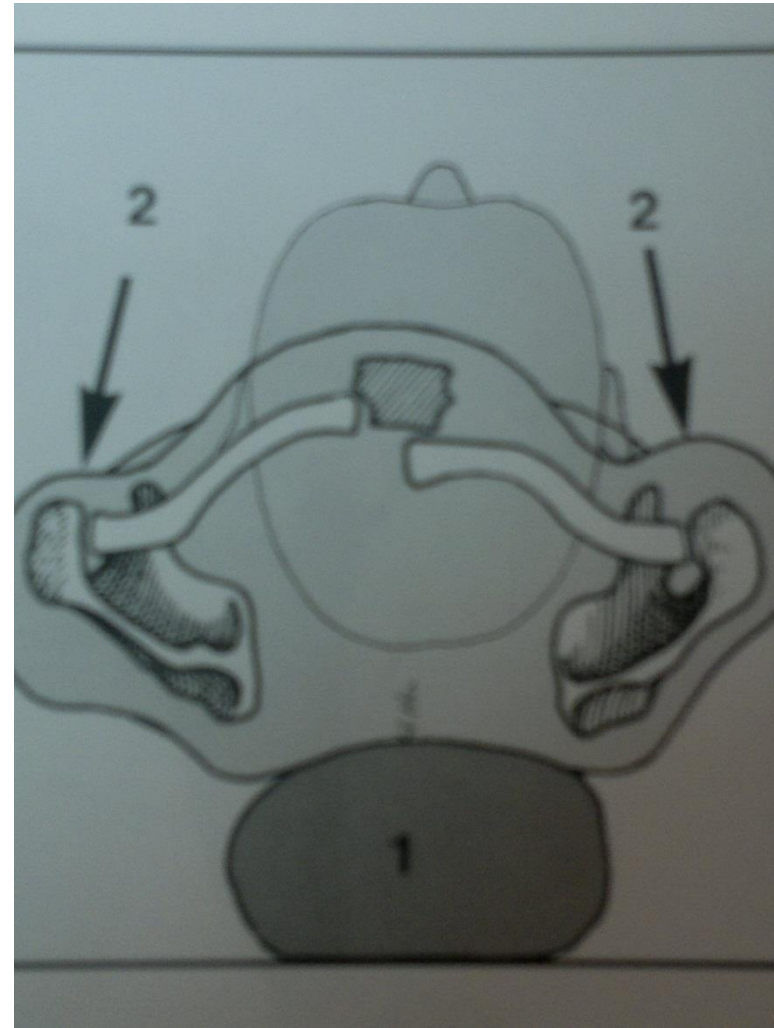
Subluxation and Dislocation of The Sterno-Clavicular Joint

- Uncommon .
- the forward displacement of the medial end of clavicle (anterior displacement) is more common .



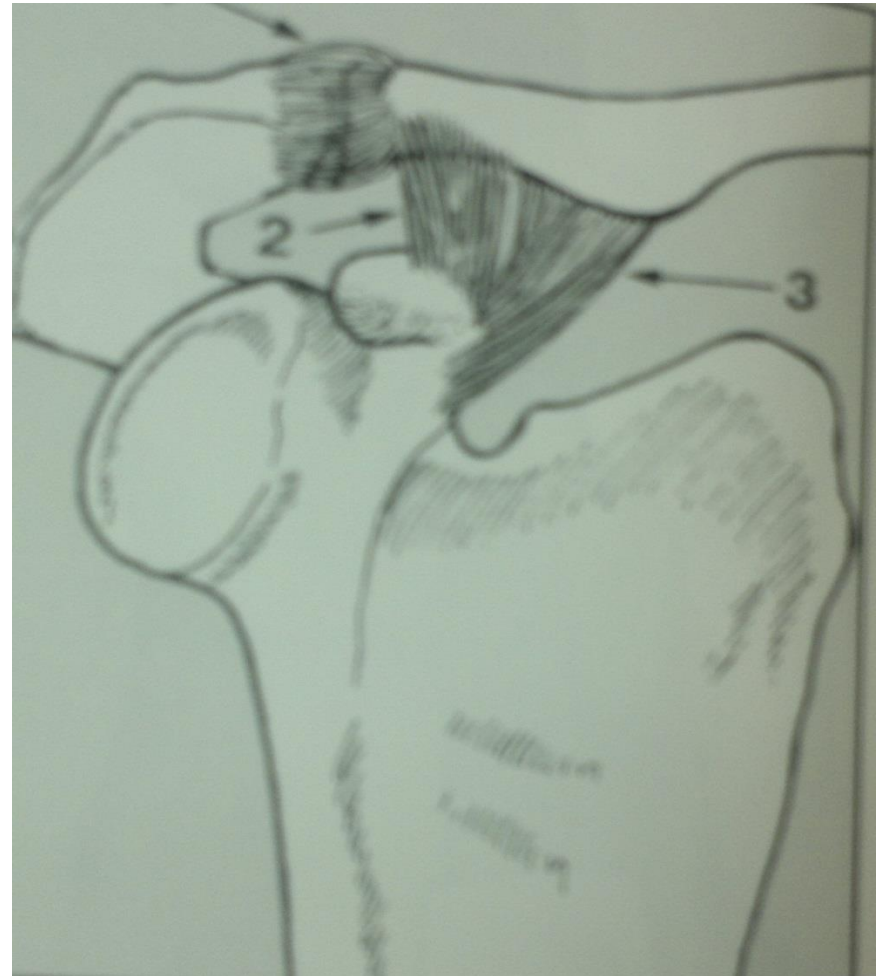
Treatment

- **Anterior displacement :**
reduction or neglecting .
- **Posterior displacement :**
operative reduction is considered.

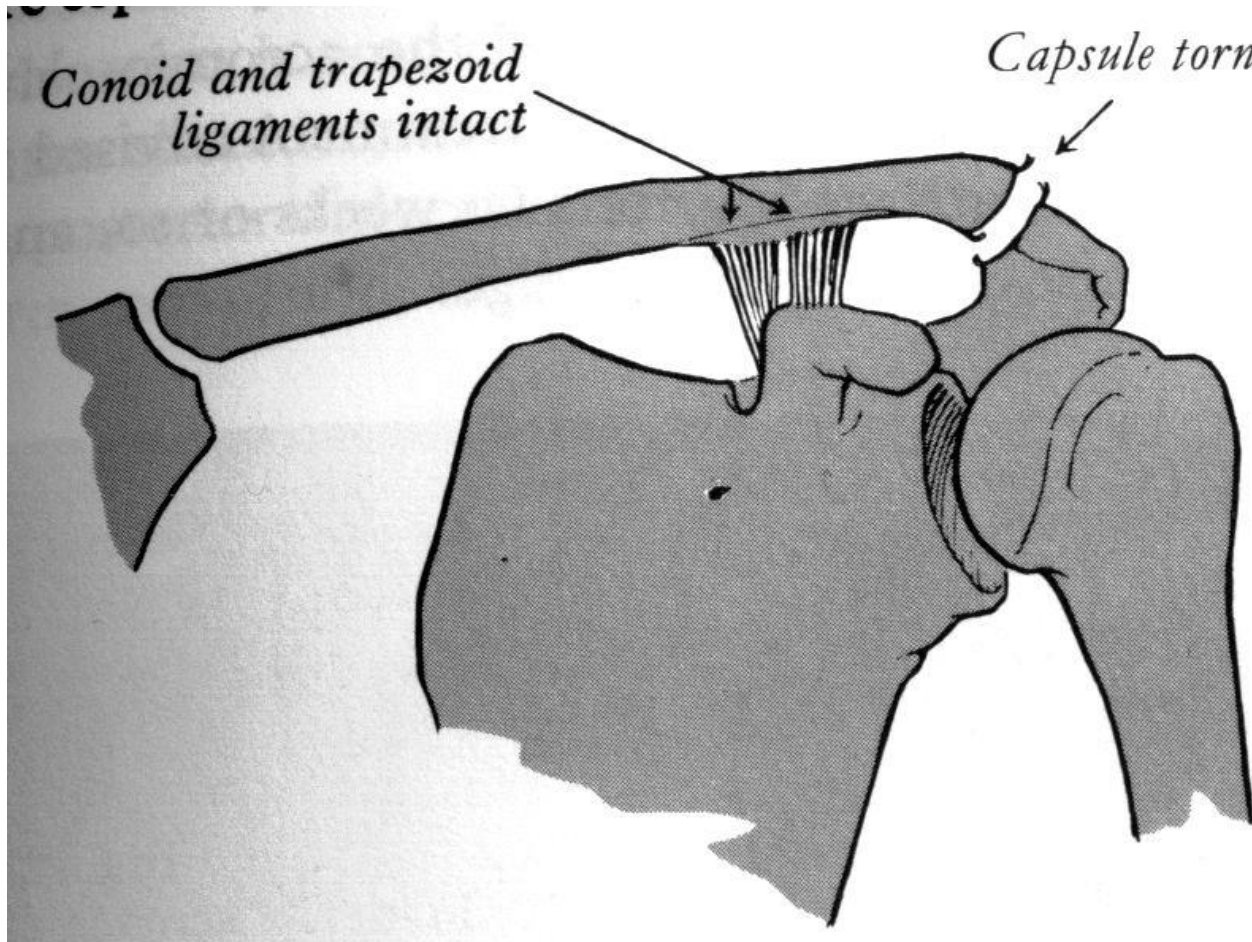


Subluxation & Dislocation of The Acromio-Clavicular joint

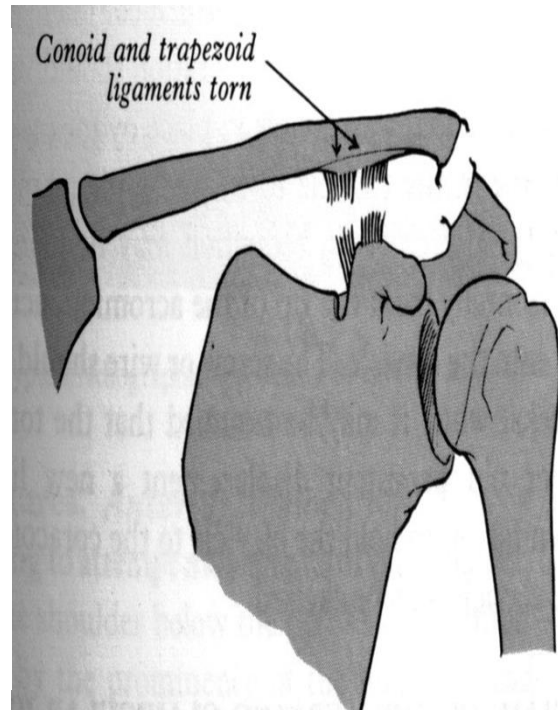
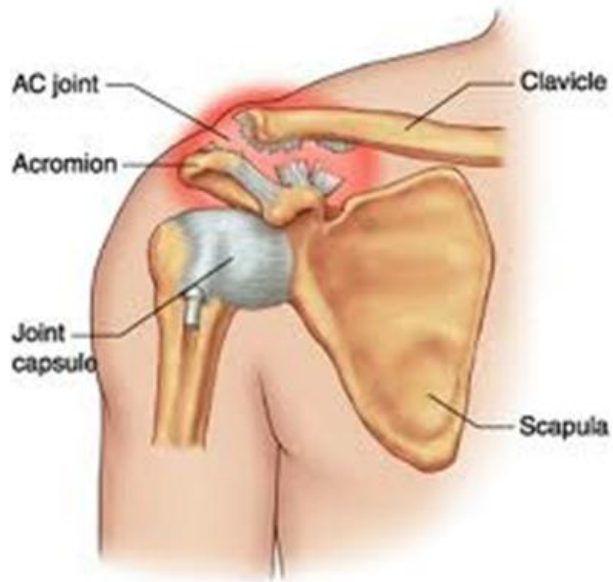
- Inherently unstable joint (weak capsule) .
- Fall on the outer prominence of the shoulder.



pathology : in subluxation the capsule is torn and the conoid and trapezoid ligaments are intact .



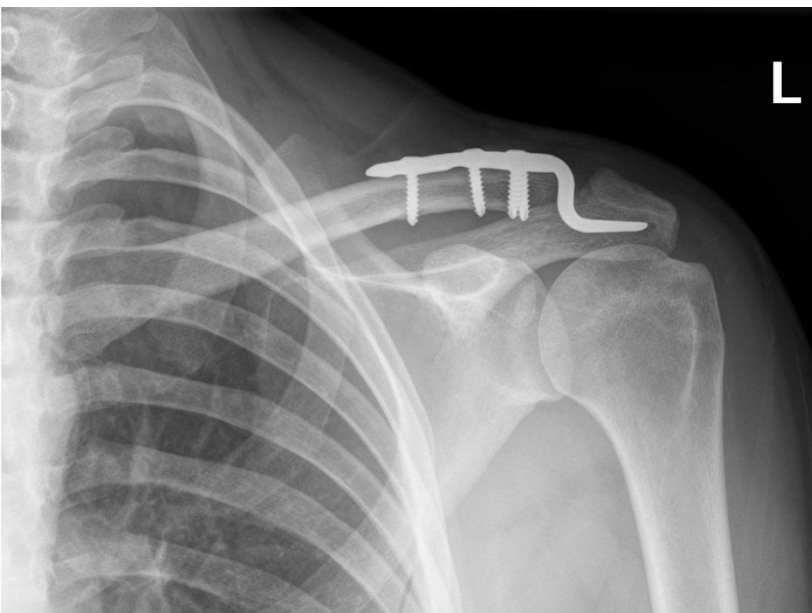
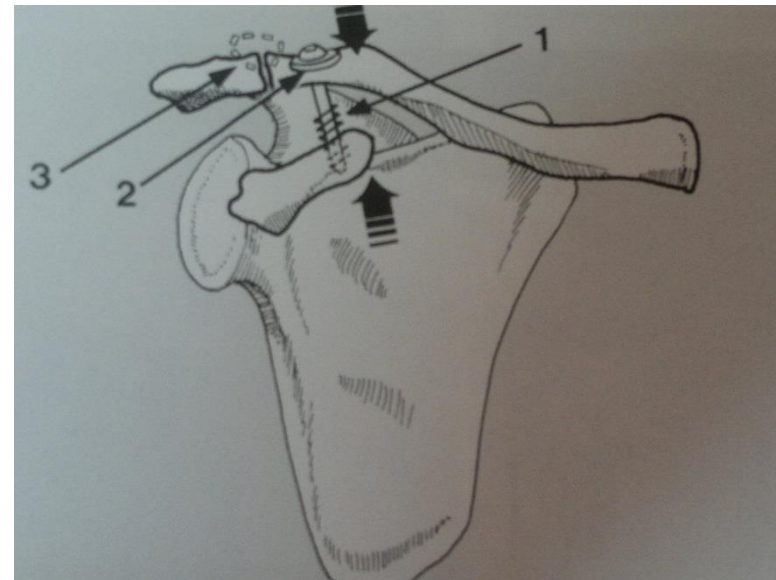
pathology : in dislocation the conoid and trapezoid ligaments are torn .



Treatment:

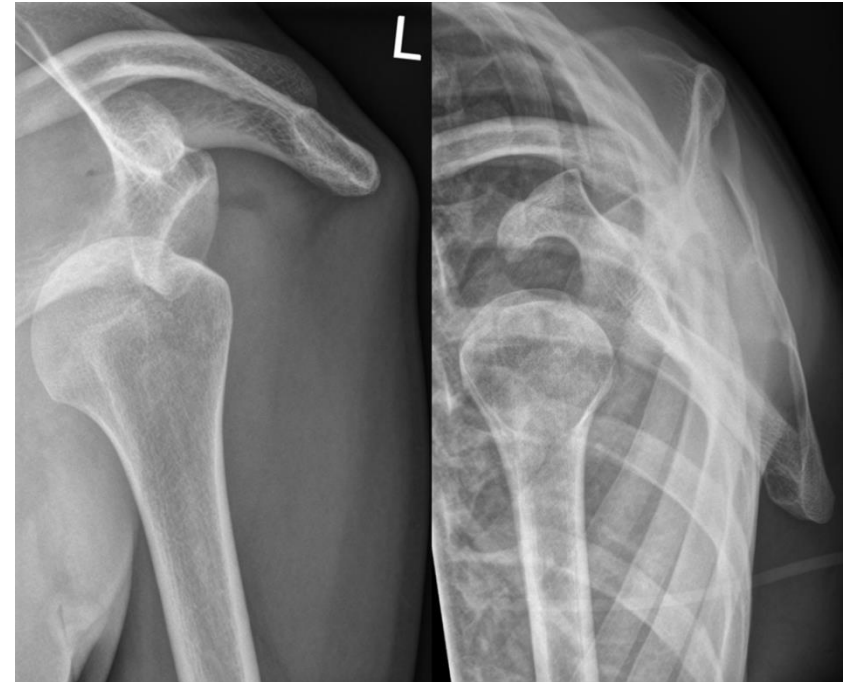
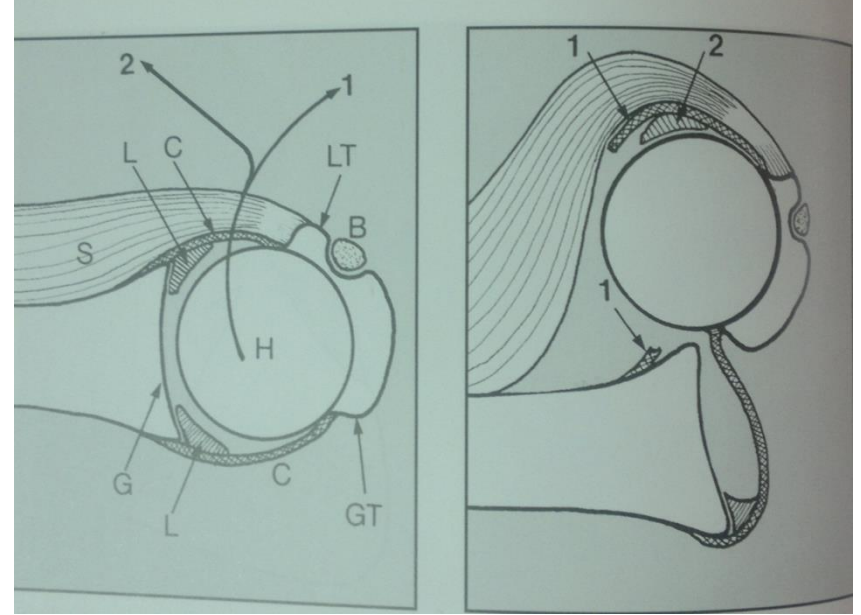
- Sprain : Sling if pain is severe.
- Subluxation: sling for 2-3 weeks .
- Dislocation: Operation :
 - 1 - A screw through the clavicle into the coracoid process.
 - 2 - Or stiff wires from the acromion into the clavicle, both should be removed after 8 -10 weeks.
 - 3 – Plate and screws .
 - 4 - In old persistent cases, end of the clavicle may be excised.

Surgical treatment



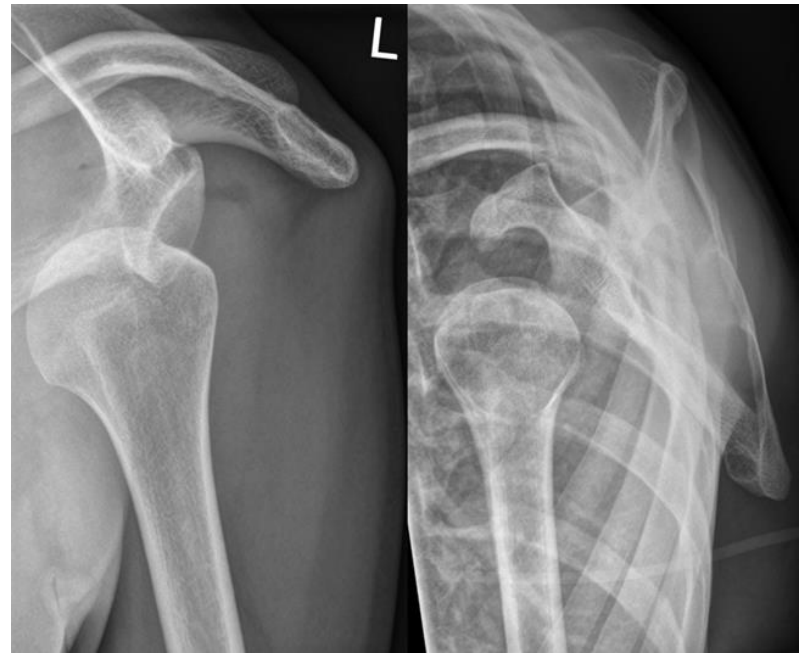
Acute dislocation of the shoulder

- Common in adults , but seldom in Children .
- **Pathology** :
 - **Anterior dislocation** : more common, Fall on the outstretched hand or on the region of the shoulder. humeral head is displaced through a rent in the capsule And lies in the infraclavicular fossa



Anterior dislocation of the shoulder

- **Clinical features** : severe pain , the patient carries his arm and refuses to attempt any movements of the shoulder.
- **Radiographs** show the humeral head out and down the glenoid fossa .



Treatment of anterior dislocation :

- immediate reduction under general anesthesia .
- ***KOSHER Maneuver*** (widely preferred) :
 - 1- Traction with the elbow flexed to 90°.
 - 2- Lateral Rotation.
 - 3- Adduction by putting the elbow on the chest.
 - 4- Medial Rotation.

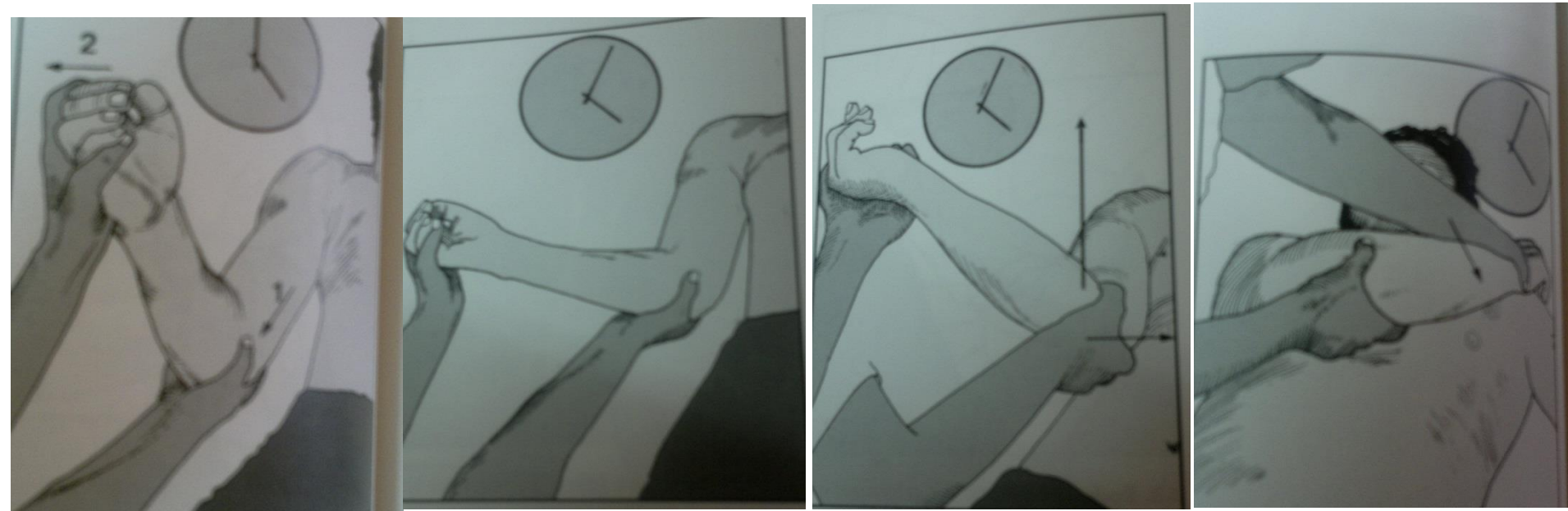
KOSHER Maneuver

1

2

3

4



Treatment of anterior dislocation :

- **Other technique :**
- Firm & steady pulling upon the semi-abducted arm against counter-traction in the axilla.
With applying direct backward pressure over the humeral head.

Complications of anterior dislocation :

- Injury of **axillary nerve** : paralysis of the deltoid muscle, and assessing sensation in its distribution .
- Injury of the **brachial plexus**
- **Vascular injury** : circumflex artery .
- **Associated Fracture:**
 - Fracture of the greater tuberosity of the humerus .
 - Fracture of the neck of the humerus .



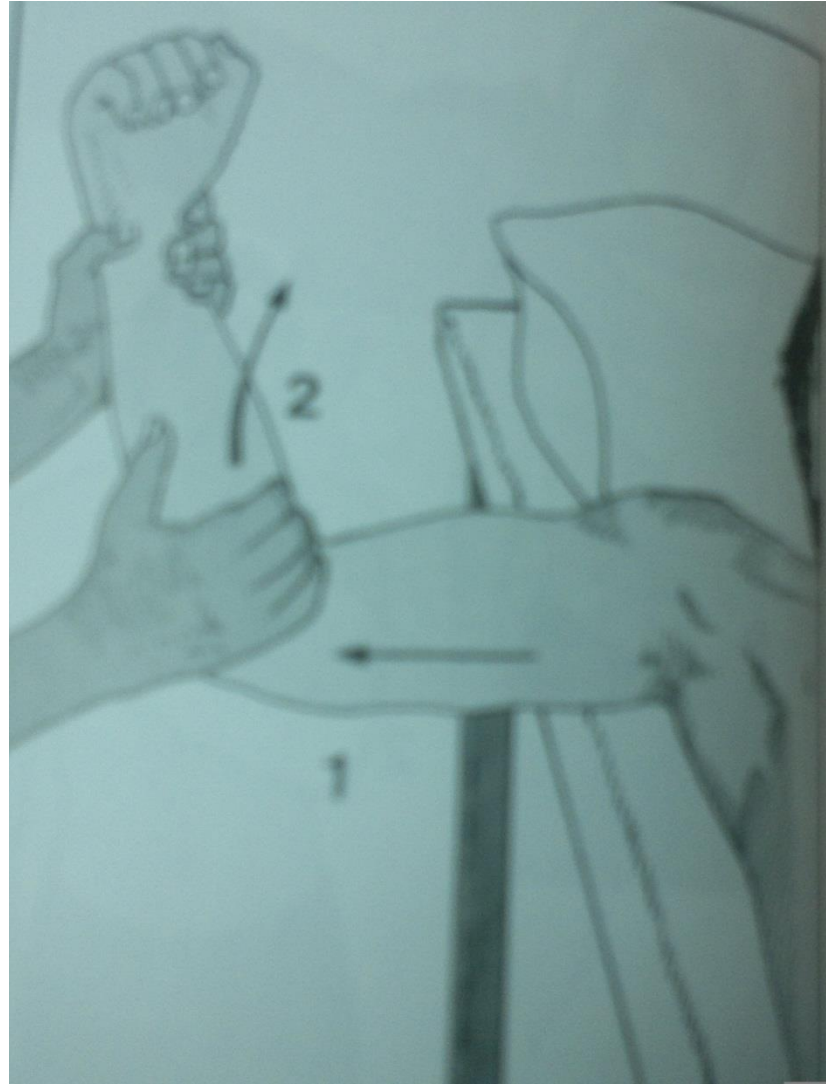
Posterior dislocation of the shoulder

- **Pathology** : direct blow to the front of the shoulder driving the humeral head backwards.
(Electric shock or epilepsy)
- **Clinical features** : history is important ,fixed medial rotation of the arm.
- **Radiographs** : often overlooked, may be misleading in the ordinary antero-posterior projection. That's why a lateral projection is necessary . and CT-scan .



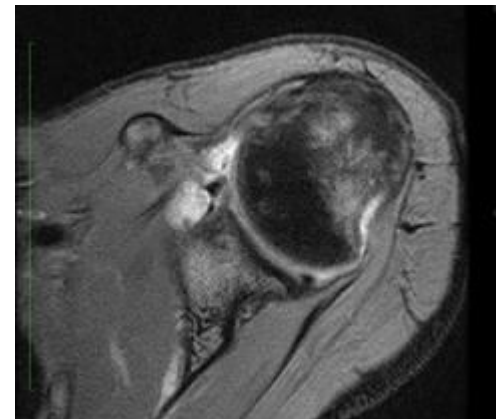
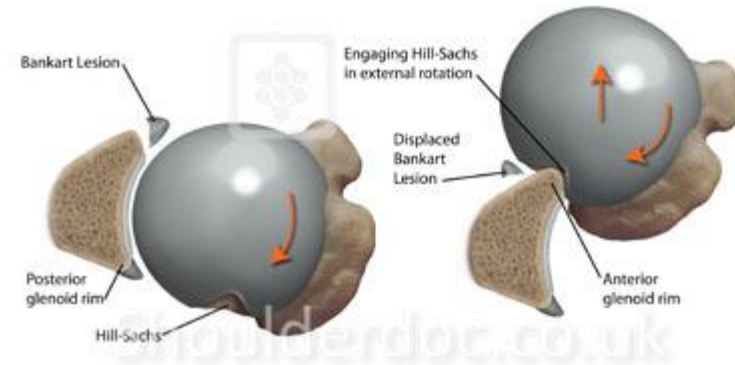
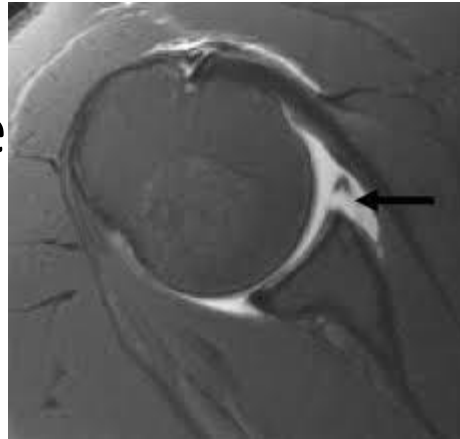
Treatment of posterior dislocation

- 1-applying traction to the arm in 90 degree abduction .
- 2-then externally rotating the limb .



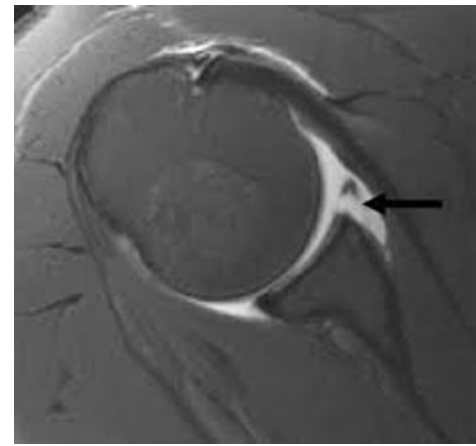
Recurrent Anterior Dislocation Of the Shoulder

- **Pathology :**
 - **Bankart lesion :** detachment of the anterior capsule and the labrum from the anterior rim of the glenoid cavity .
 - **Hill-sachs lesion :** the humeral head is dented postero-laterally .



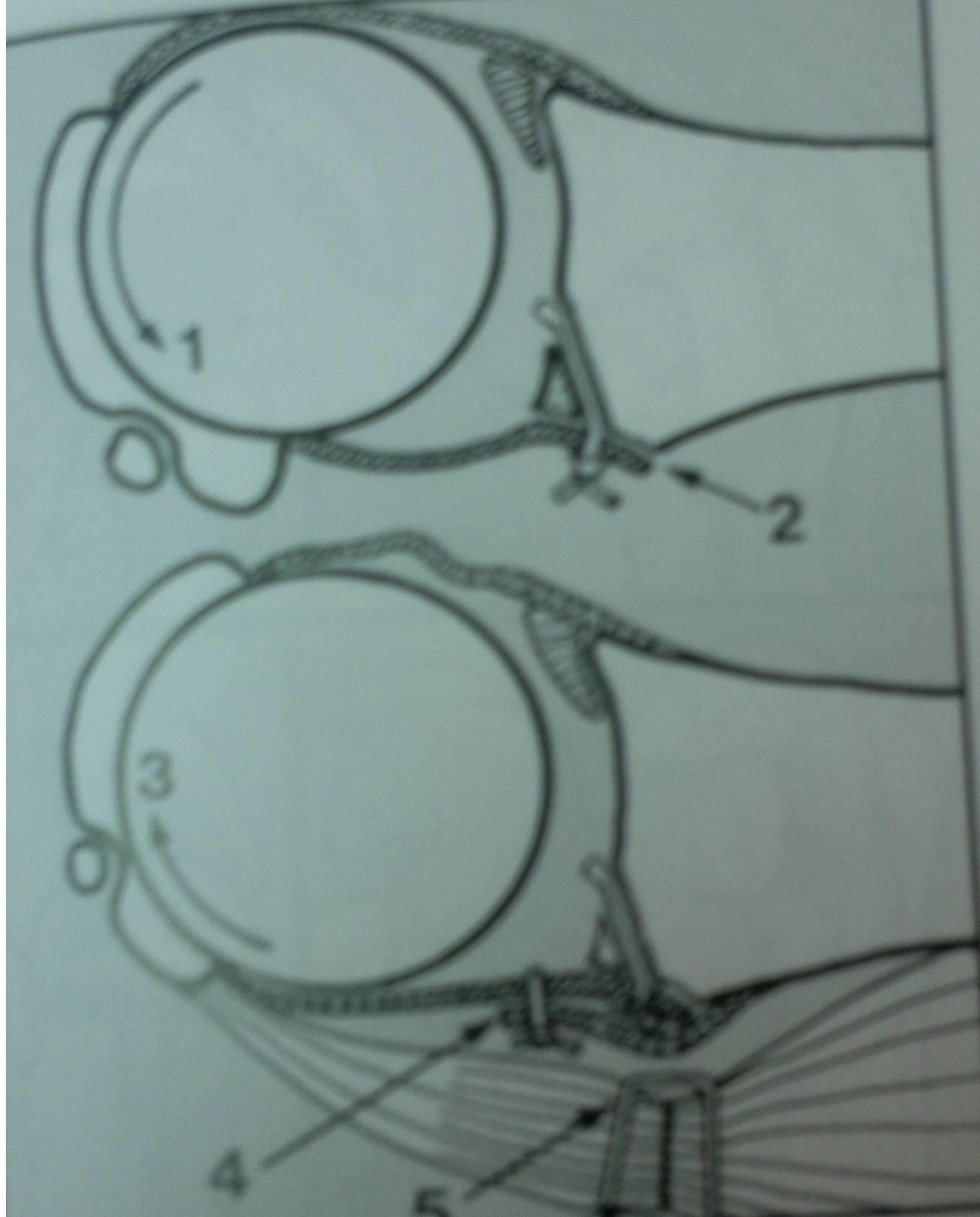
Recurrent Anterior Dislocation Of the Shoulder

- **Diagnosis :**
- History of recurrent dislocation (when the arm is abducted, extended and rotated laterally) , weakness in the muscles of the shoulder girdle .
- x-ray .
- CT scan with contrast .
- MRI .



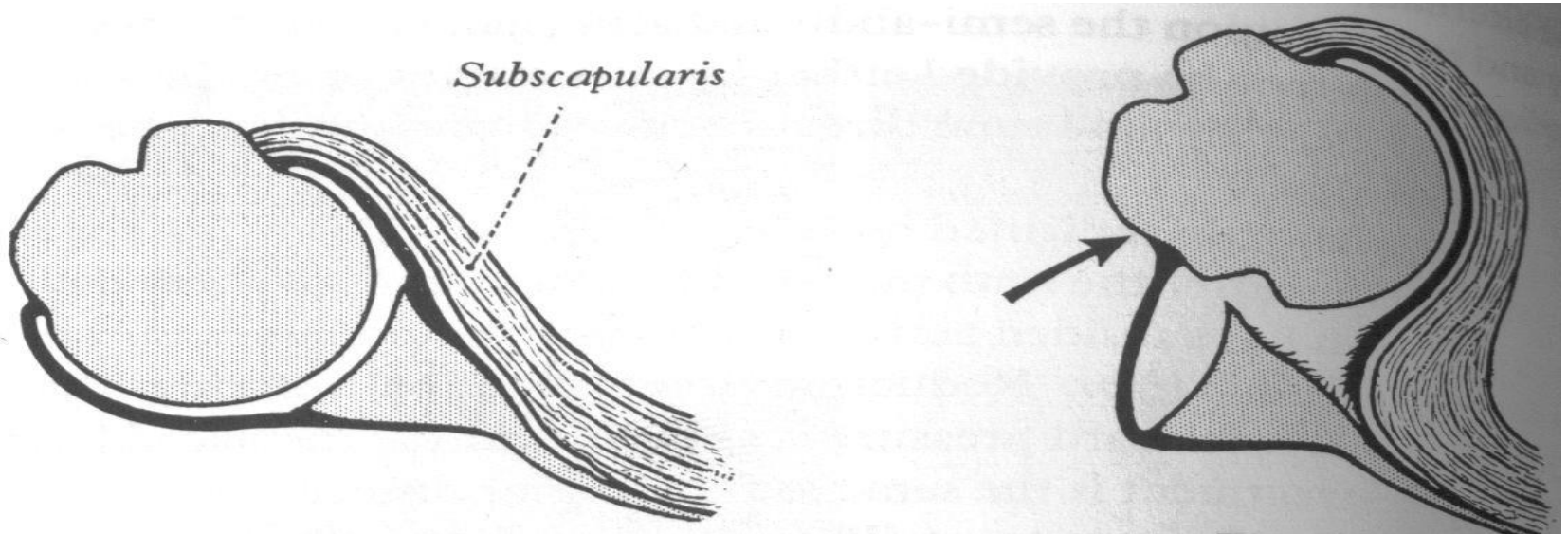
Treatment :

- **BANKART**
operation :
reattach the
capsule & the
glenoid labrum to
the front of
glenoid rim.

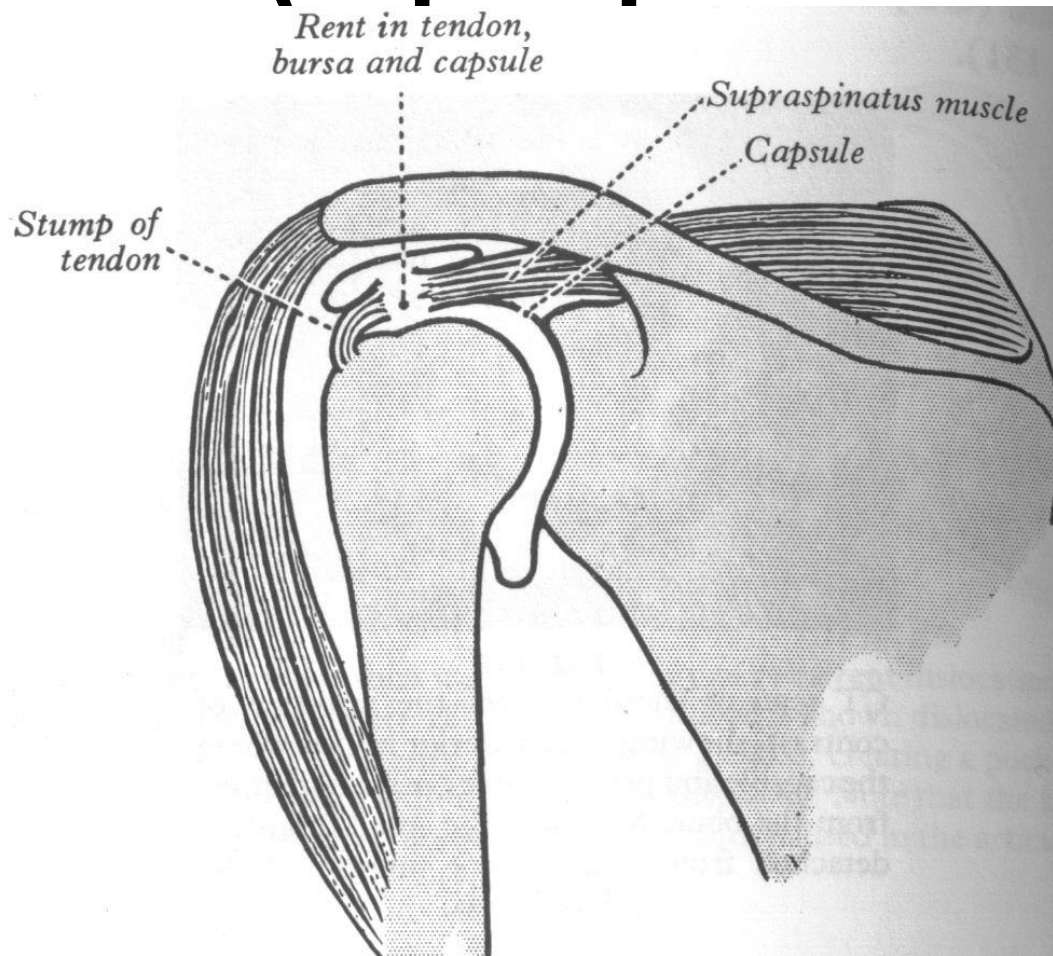


Treatment :

- **PUTTI-PLATT operation :**
shortening the subscapularis muscle.



Rupture of rotator cuff of the shoulder(supraspinatus tear)

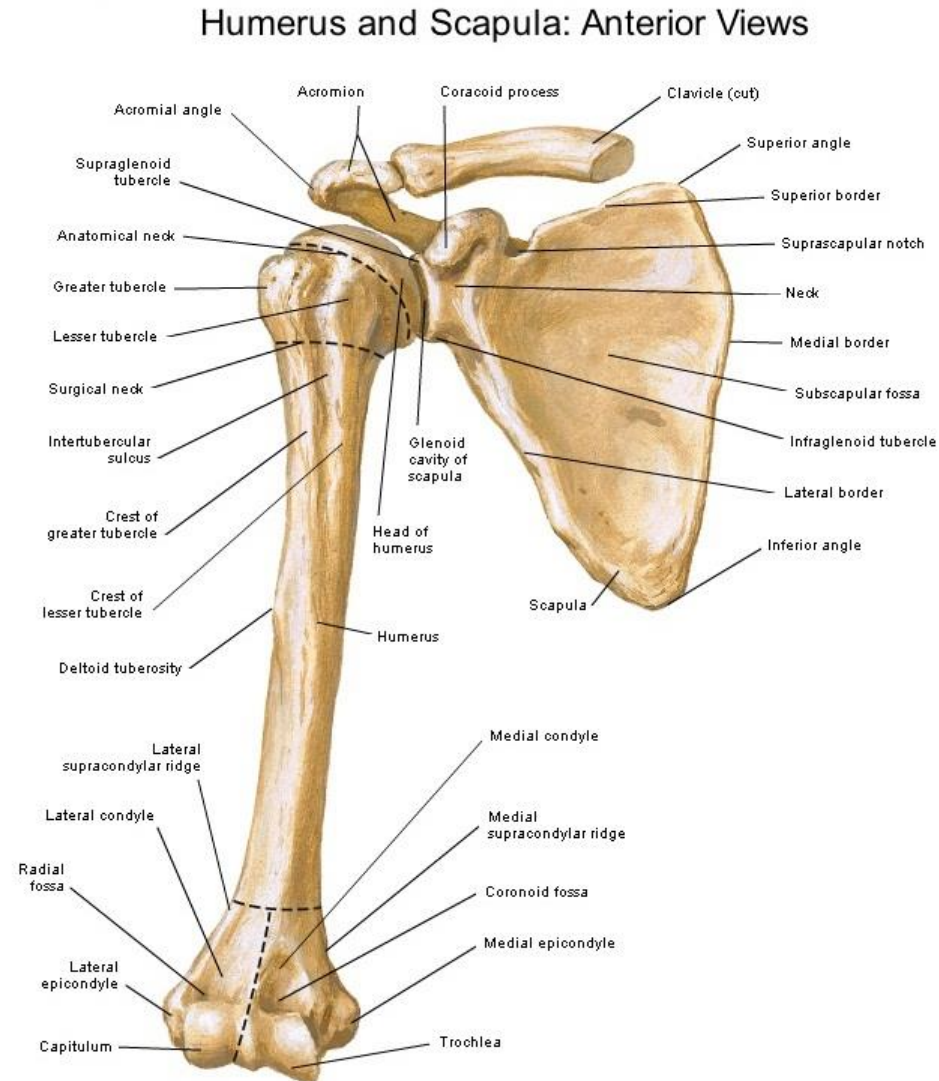


Rupture of rotator cuff of the shoulder

- Degeneration in the supraspinatus tendon .
- Fall on the shoulder or daily repetitive activities .
- In **MAJOR TEAR** , disability of initiation abduction.
- Treatment :
 - * Old patients :no treatment, only rest might help .
 - * Young patients : Operation .
- In **MINOR TEAR**, painful arch syndrome . Treated with rest , short waves , graduated exercises.

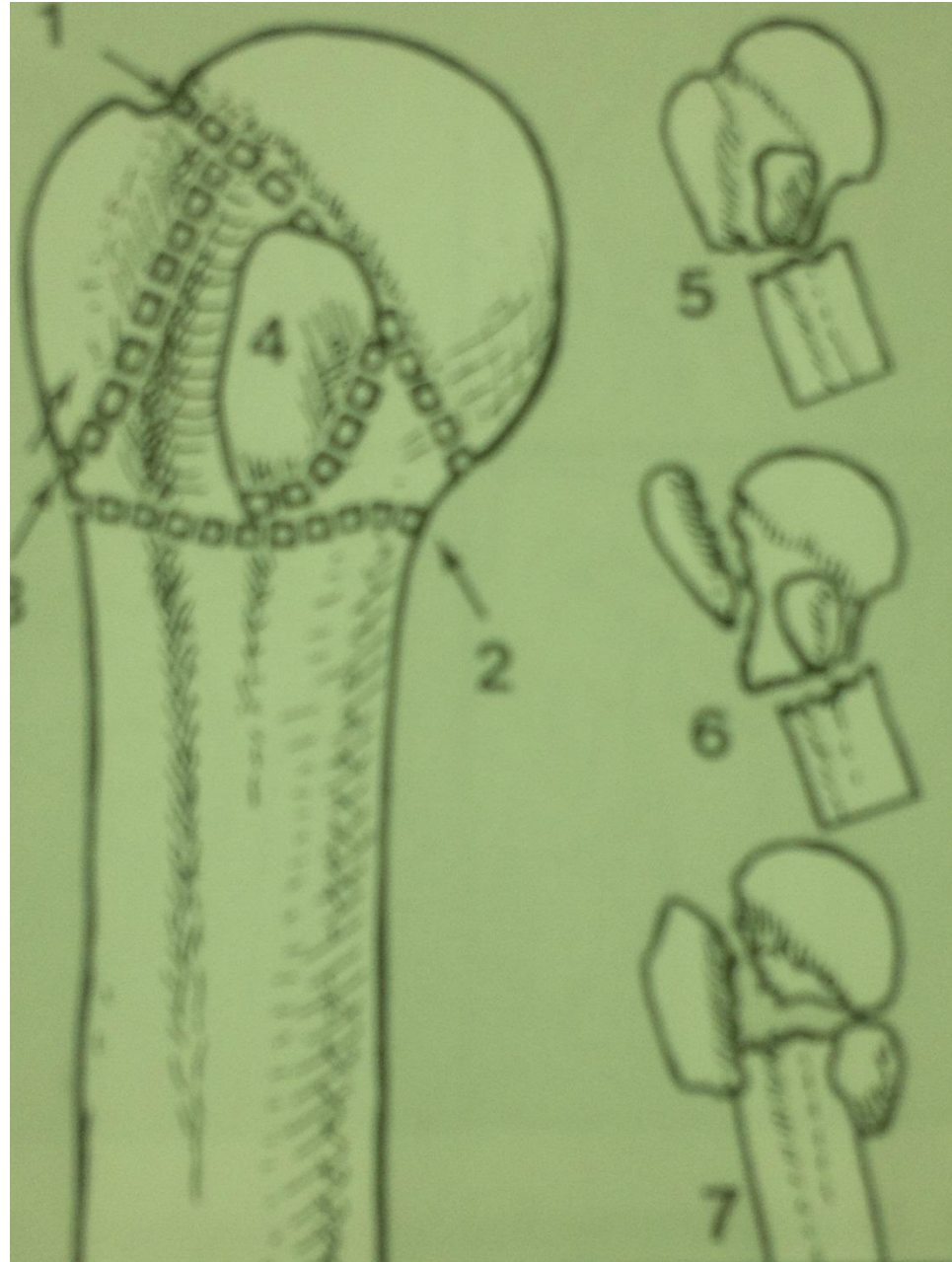
Fractures of the humerus

- 1- Fr. Of the neck of humerus
- 2- Fr. Of the greater tuberosity
- 3- Fr. Of the shaft of humerus
- 4- Supracondylar Fr.
- 5- Fr. Of the condyles
- 6- Fr. Of the epicondyles



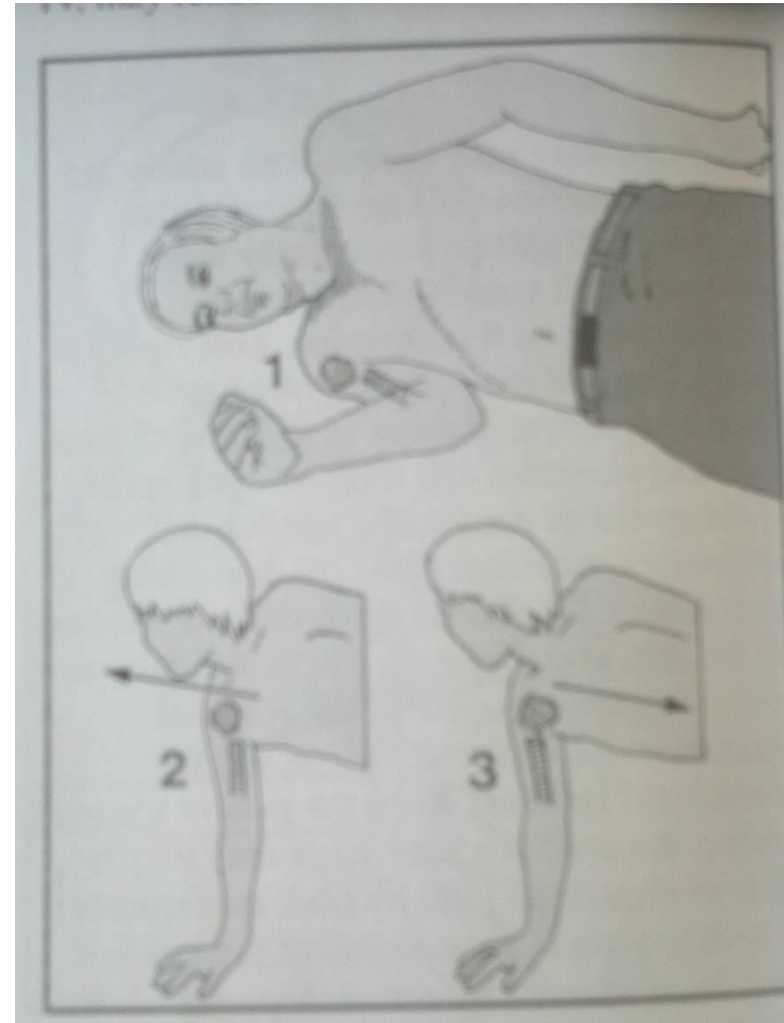
Anatomy Of The proximal Humerus

- Anatomical neck
- Surgical neck
- Greater tuberosity
- Lesser tuberosity



Fractures Of The Neck Of The Humerus

- Most common in elderly women .
- Caused by a fall on the side of the shoulder or on the outstretched hand .



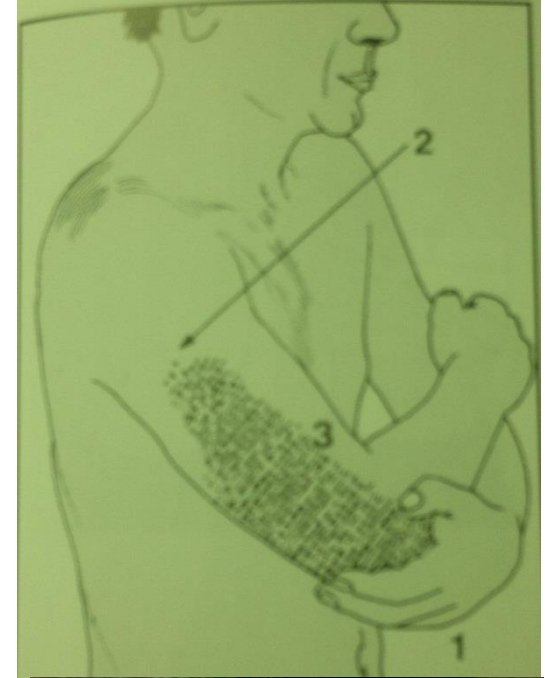
Fractures Of The Neck Of The Humerus

- Displacement may be none, or moderate , or overlapped .
- Fragments may be firmly impacted
- or sever tilting (angulation) of the head fragment, The shaft either adducted or abducted in relation to the head .



Diagnosis

- Patient tends to support the arm with the other hand .
- Tenderness over the proximal humerus .
- Obvious deformity in severely angled or displaced fracture .
- Later , gross bruising gravitating down the arm .



Radiographs

- Fracture may be impacted.
- Translateral projection will generally be able to clarify the relationships of the fragments.
- CT –scan is essential in some cases .



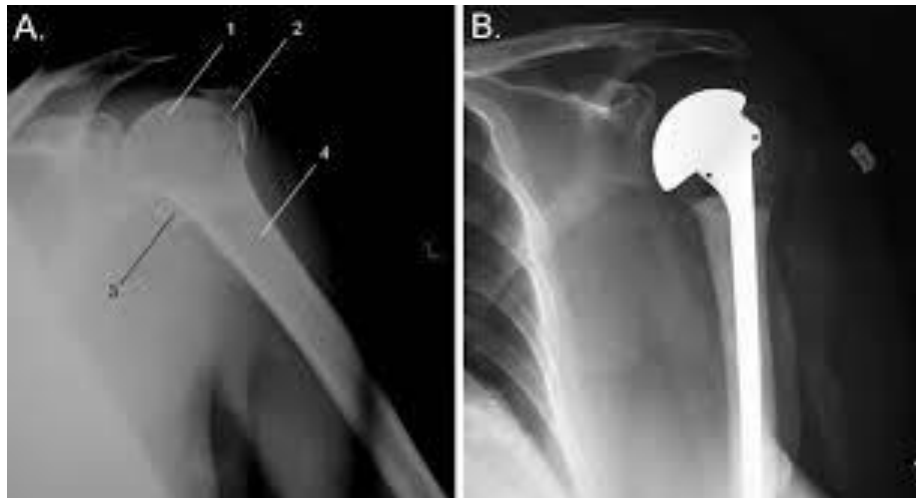
A



B

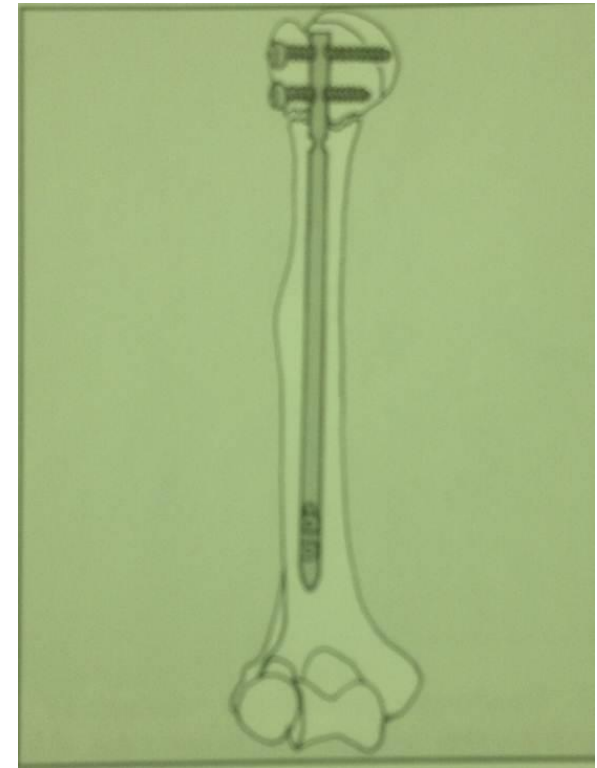
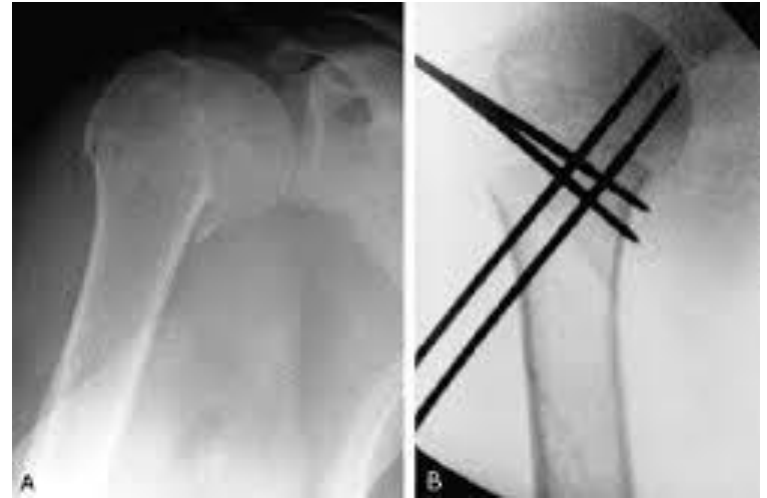
Treatment

- **In elderly patients :**
 - Moderate displacement is accepted
 - Sling with early movement .
 - Arthroplasty : in comminuted displaced fractures .



Treatment

- **In young patients :**
closed reduction ,
or open reduction
& internal fixation
(k.wires , plating,
nailing....)



Complications

- **Joint Stiffness** : in old patients
- **Nerve Injury** : Axillary nerve, impaired movement of the deltoid muscle, numbness or anaesthesia on the outer side of the upper arm
- **Dislocation of the shoulder** : rare



Fracture Of The Greater Tuberosity Of The Humerus

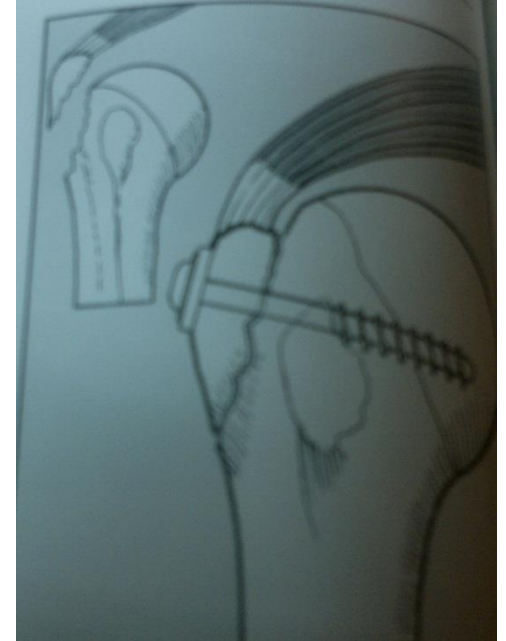


- Adults of any age .
- Fall on the shoulder .
- Usually there is no marked displacement .
- In some cases a small fragment might be lifted away .



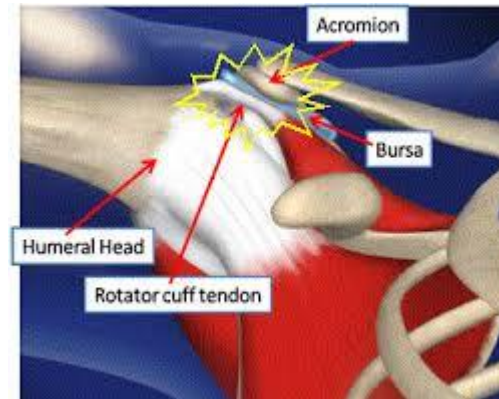
Treatment

- **Undisplaced** : rest with early movement .
- **Displaced** : Fixing with abduction, or operation .



Complications

- Painful arc syndrome (supraspinatus syndrome) .



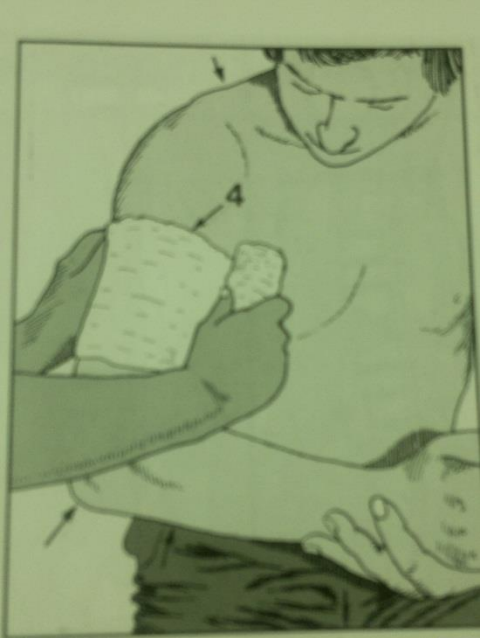
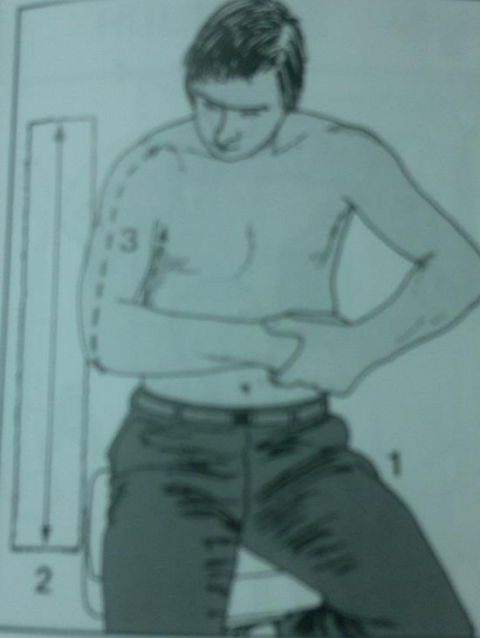
Fractures Of The Shaft Of The Humerus

- Usually in the middle third .
- - Indirect twisting force : Spiral fracture .
- - Direct violence : transverse, short oblique, or comminuted fracture
- Adults of any age, but seldom in children
- Displacement, angulation, or overlapping
- Proximal half of the humerus is a common place of pathological fracture.



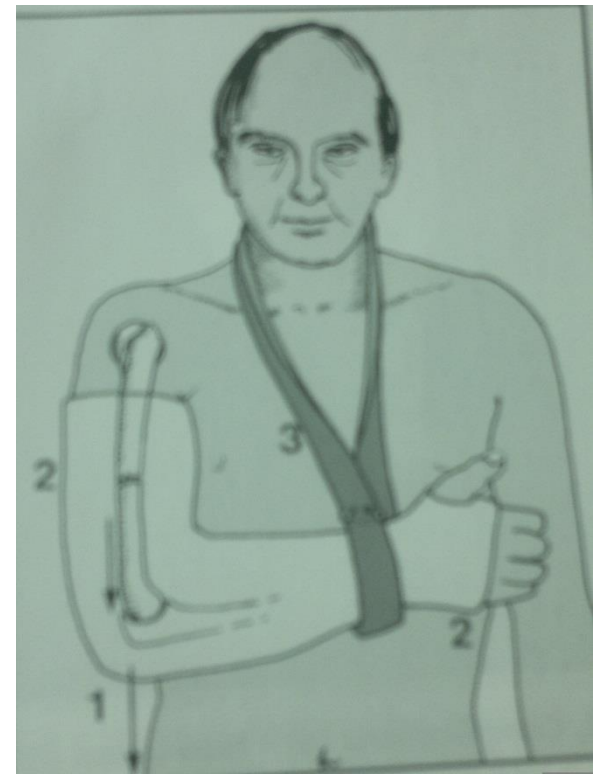
Treatment

- Perfect end-to-end position is unnecessary .
- Contact over a quarter or a third is sufficient .
- Displaced : reduction under anesthesia with U-slap and sling for farther support, or reduction by using hanging cast.
- Exercises of the shoulder and fingers are necessary.
- Unstable or Pathological : operation.



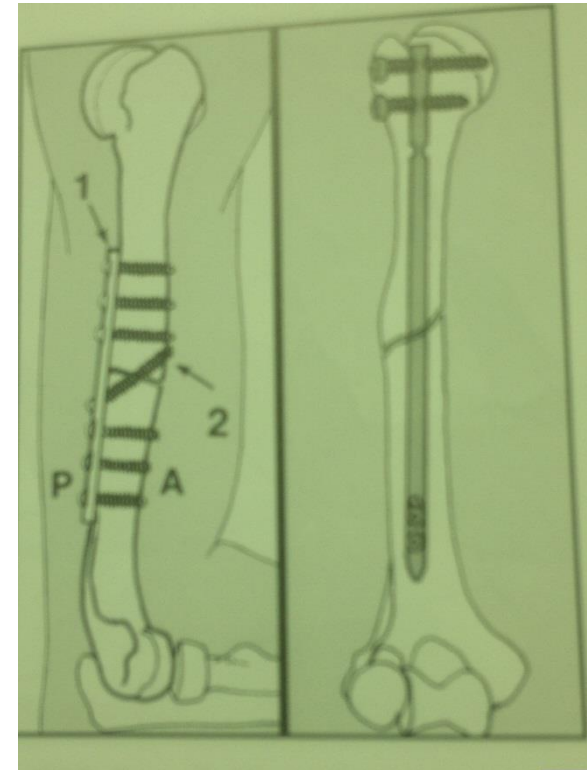
U – Slab application

Hanging cast



Surgical treatment

- Plating
- Interlocking nail



Pre- operative x-rays

Immediate post- op

Complications

- **Nerve Injury :**

Radial nerve (drop-wrist), usually contusion which recovers gradually, seldom a complete division which needs an operation with a bad prognosis .

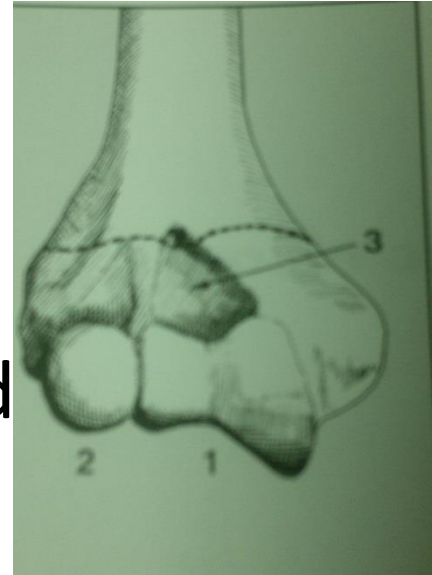
- **Non-union :**

Bone-grafting operation with internal fixation.



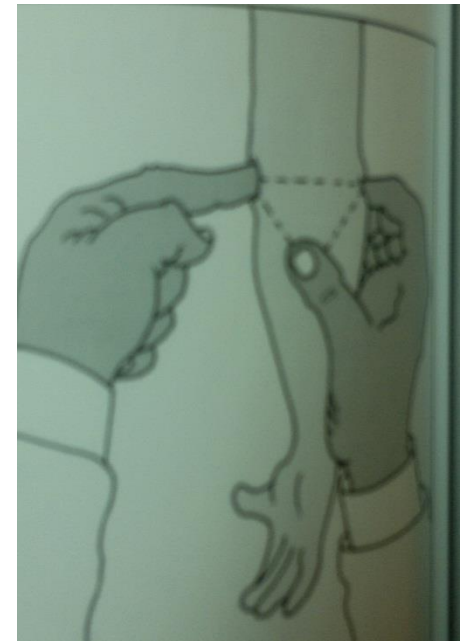
Supracondylar Fractures

- Common in children .
- Important and dangerous .
- Fall on the outstretched hand
- The commonest displacement is posterior:
(The distal fragment is displaced posteriorly) .



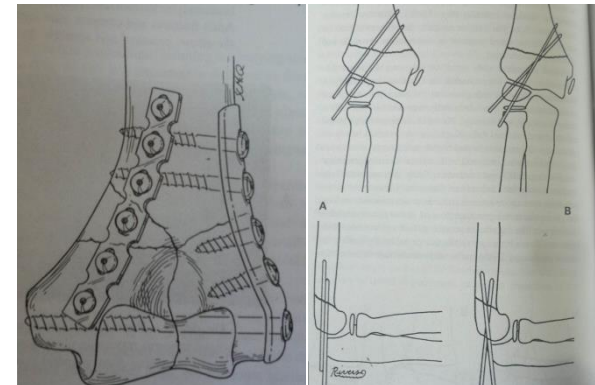
Diagnosis

- Tenderness over the distal humerus .
- There may be marked swelling and deformity
- Vascular & neurological evaluation is mandatory .
- The olecranon and medial and lateral epicondyles preserve their normal equilateral triangular relationship (unlike dislocation of the elbow).



Treatment

- Undisplaced in children :
3weeks protection in plaster .
- Displaced : Reduction under anesthesia , and plaster with elbow flexed little more than 90°. With precautions for circulation.
- If unstable: closed reduction or open reduction with fixation (K.wires in children , plates & screws in adults)



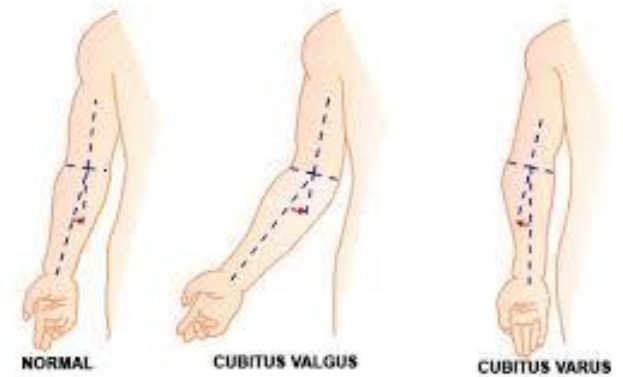
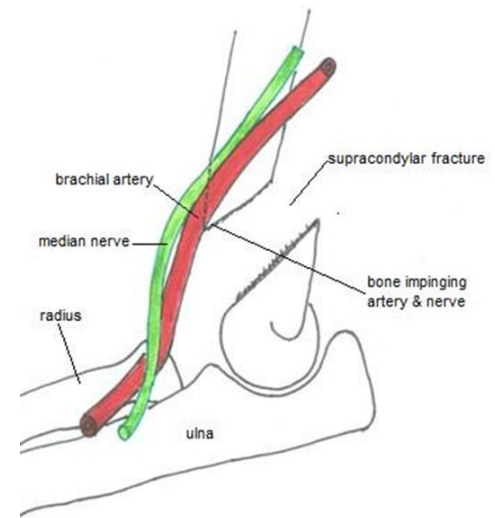
Complications

- Brachial artery injury :
 - simply or severely contused
 - spasm of the vessel wall
 - thrombosis .

(management : first of all; reduction and fixation of the fracture , then reevaluation)

- Injury to median , ulnar or radial nerves .

- Deformity from mal-union : cubitus varus



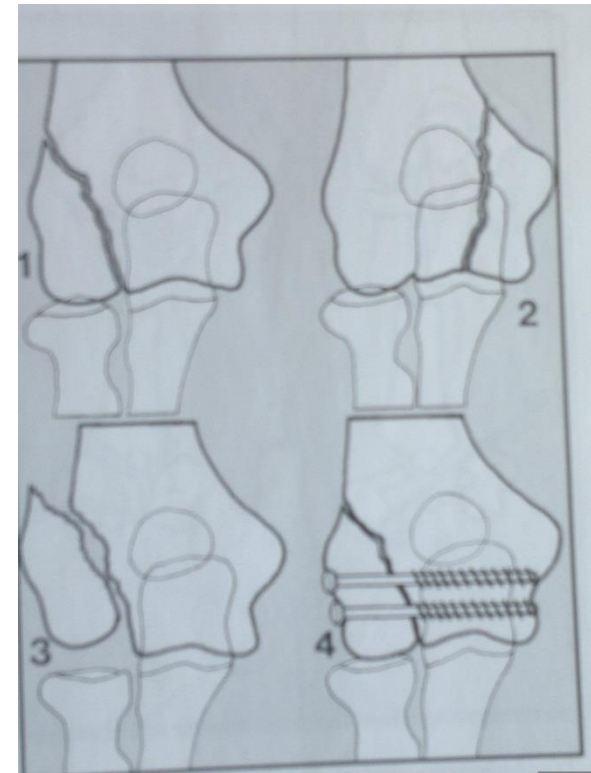
Fractures of the condyles of the humerus

- Uncommon but troublesome .
- In Children by a fall .
- More common in the lateral condyle .
- Displacement is seldom sever, but even moderate displacement is important .



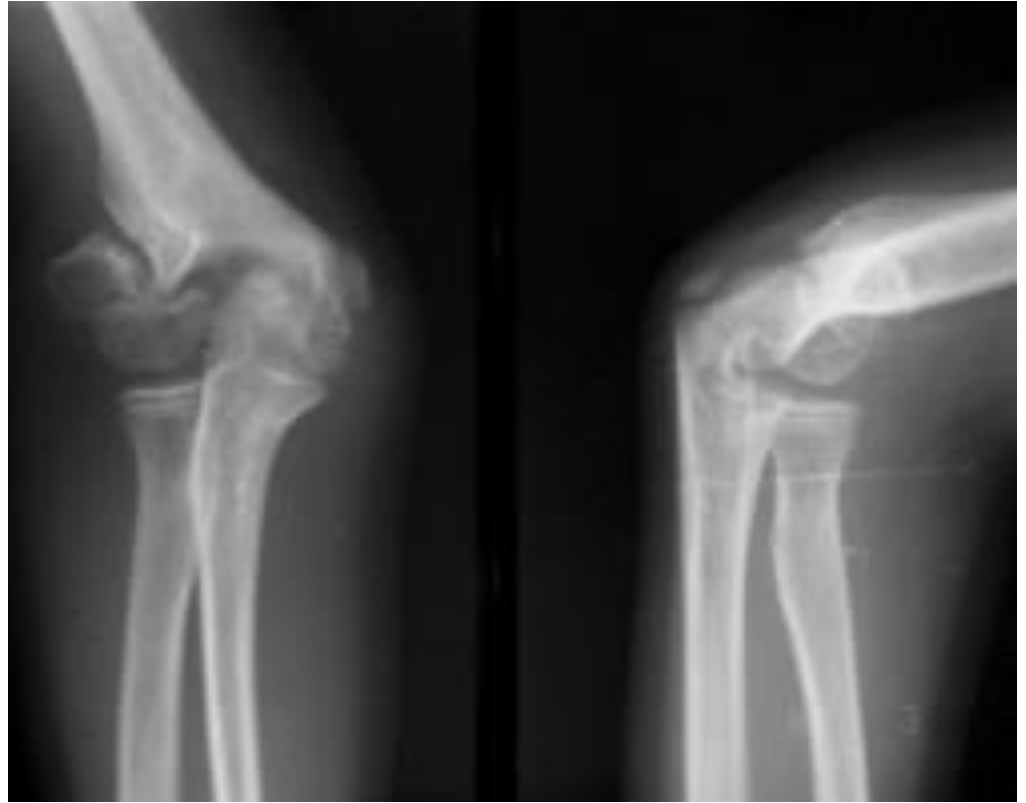
Treatment

- **Undisplaced fracture:** Plaster for 4-6 weeks, physiotherapy.
- **Displaced fracture :** reduction and internal fixation .



Complications

- Non-union,
- Osteoarthritis,
- Deformity: Cubitus varus or valgus,
- Ulnar nerve injury .



Fractures of the epicondyles

- More common in the medial epicondyle.
- More common in children than adults .
- By direct violence, but often by pulling the Epicondyle by the attached flexors during a fall.
- May be associated with dislocation or subluxation in the elbow.



Treatment

- **Mild displaced fracture** : symptomatic.
- **Displaced fracture** : Reduction with plaster with 90° flexing of the elbow and pronation (medial epicondyle) or supination(lateral epicondyle) , physiotherapy .
- **Complicated fracture** :
open reduction & internal fixation



Complications

- Inclusion of the epicondylar fragment in the joint .
- Injury of the ulnar nerve .

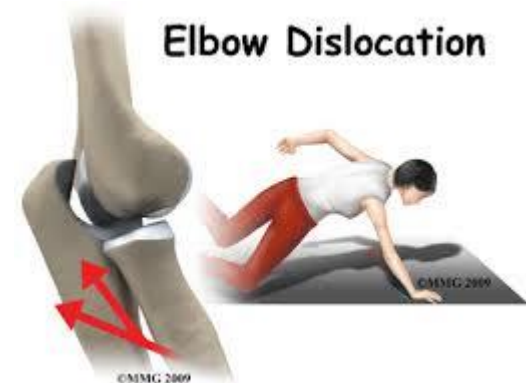


Injuries of the elbow

- Dislocations:
 - Dislocation of the elbow
 - Dislocation of the head of the radius
 - Subluxation of the head of the radius

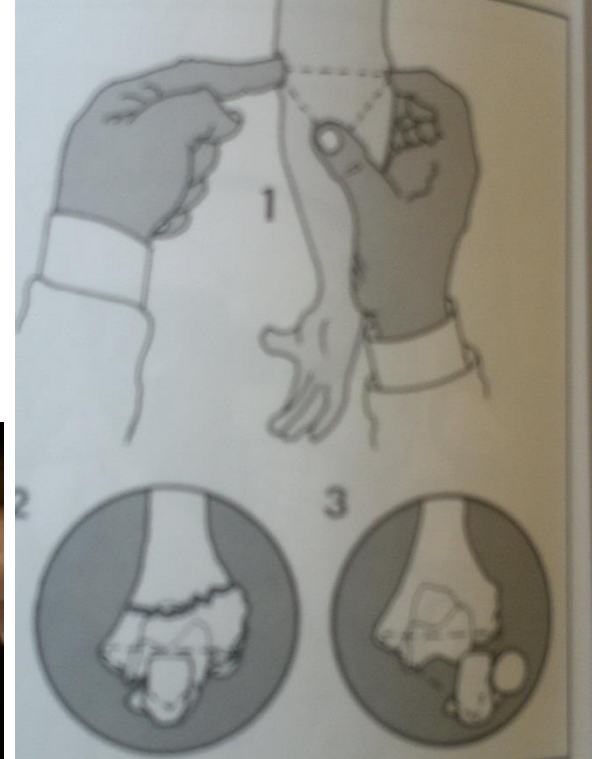
Dislocation of the elbow

- caused by a heavy fall onto the outstretched hand
- common in children and adults
- **Pathology:** MOSTLY posterior or postero-lateral, the ulna and the radius are displaced backward , and dislocation may be associated with fracture of the coronoid process of the ulna, or the radial head.



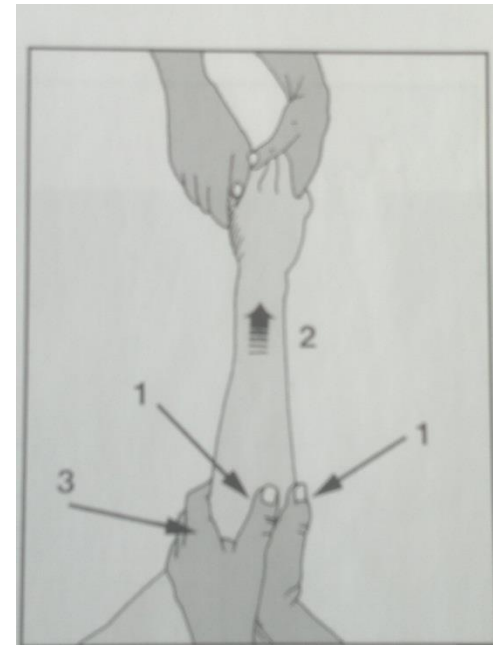
Diagnosis

- Distorted the equilateral triangle formed by the olecranon & epicondyles
- Radiographs confirm the diagnosis



Treatment

- reduction is easy under anesthesia .
- pull steadily upon the forearm with the elbow semi-flexed while direct pressure is applied behind the olecranon .



REDUCING A
DISLOCATED
ELBOW



Treatment

- Reduction is confirmed by radiographic examination,
- Plaster back slab in 90 degree of flexion for 2 weeks .
- Exercises (VERY EARLY IF REDUCTION IS STABLE) .

Complications

- vascular or nerve injury , occasionally the brachial artery or one of the major nerve trunks is damaged.
- Joint stiffness usually caused by intra-articular and peri-articular adhesions, manipulation and passive stretching should be avoided,
- a less common is post-traumatic ossification condition in which new bone forms in the hematoma beneath.



Dislocation of the head of the radius

- Occasionally the head of the radius may be dislocated forwards without fracture caused by **forced pronation**.
- Reduction by supinating the forearm while direct pressure is applied over the displaced radial head.



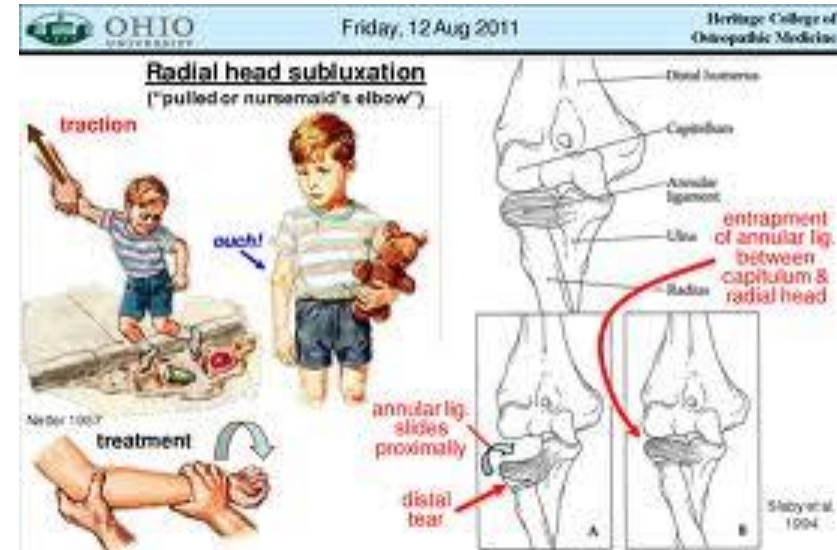
Dislocation of the head of the radius

- **Caution:** dislocation of the head of the radius as an isolated injury is rare, radiographic examination should always include the whole length of the ulna to rule out a fracture (**Monteggia fracture - dislocation**).



Subluxation of the head of the radius (pulled elbow)

- Young child is lifted by the wrist, the head of the radius may be pulled partly out of the annular ligament.
- Local pain, movements of the elbow are restricted.
- Reduction is easy by pushing the forearm upwards and rotating it into supination and pronation.



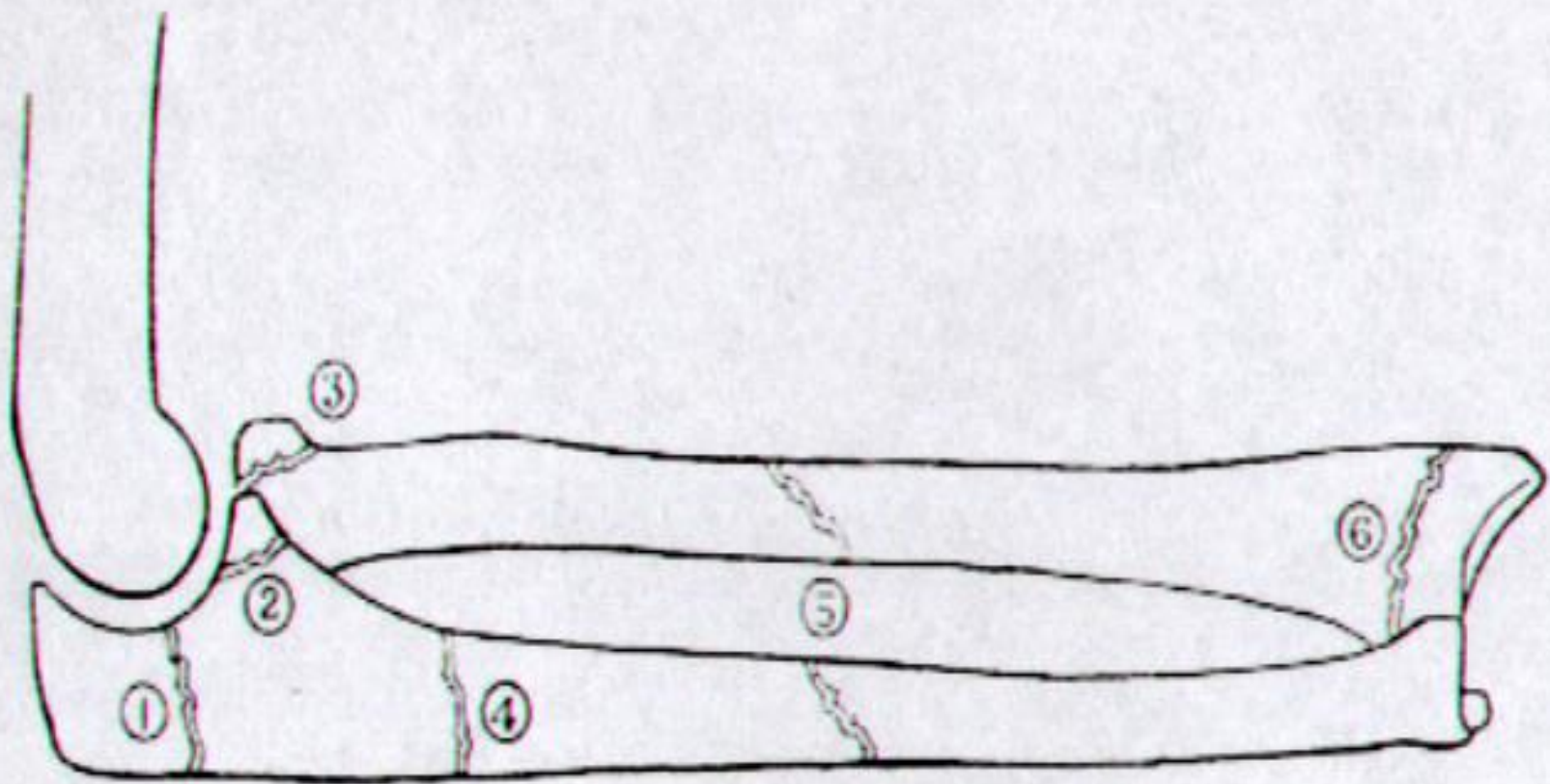


Fig. 157

Visual classification of fractures of the forearm bones. 1. Fracture of olecranon process. 2. Fracture of coronoid process. 3. Fracture of head of radius. 4. Fracture of uppermost third of ulna with dislocation of head of radius. 5. Fractures of shafts of radius and ulna (separately or together). 6. Fracture of lower end of radius.

Fracture of the olecranon process

- A fall onto the point of the elbow usually in an adult.
- The fracture may take three forms :
 - fracture without displacement,
 - fracture with displacement (two fragments) .
 - comminuted fracture.
- The fracture line nearly always enters the joint near the middle of the trochlear notch.



Treatment

- **Fracture without displacement:**
protect the elbow by a plaster splint for 2 or 3 weeks , the right-angled position is more comfortable for the patient.
- **Fracture with displacement :**
because the action of the triceps will angulate and distract the fragments, operation should be advised.



Treatment

- **Comminuted fracture:**
- open reduction and internal fixation if possible .
- or excision the olecranon fragments and securing the triceps on the stump of the ulna by strong sutures(very limited indication).

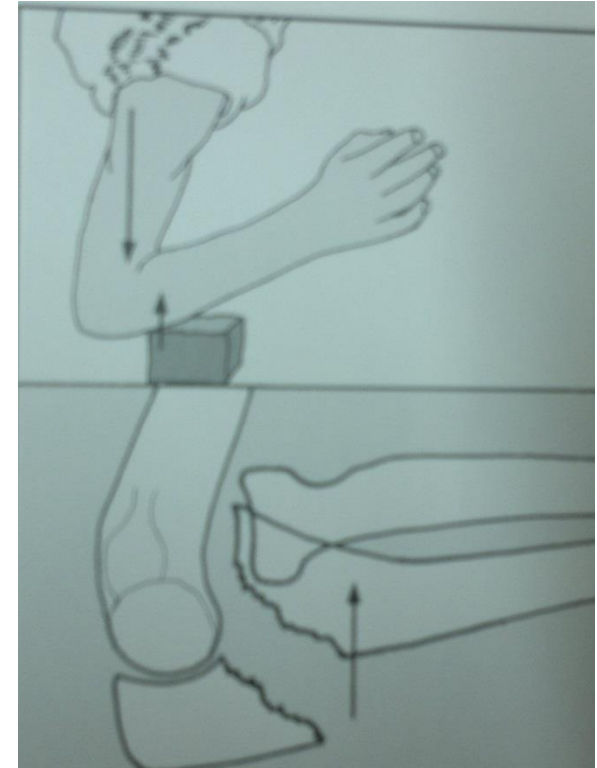
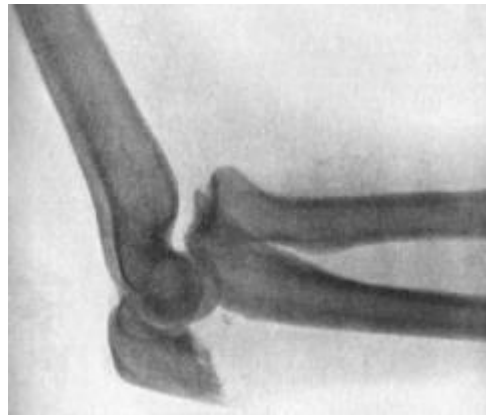


Complications

- non-union,
- mal-union ,
- osteoarthritis.

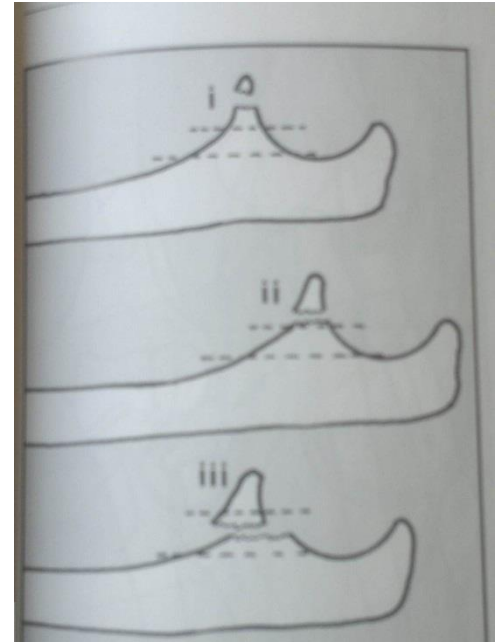
Fracture of the olecranon process with anterior dislocation of the elbow

- Uncommon injury
- Fall on the elbow, and forearm bones is pushed forwards .
- Very unstable injury .
- Surgical treatment .



Fracture of the coronoid process

- Seldom except in association with posterior dislocation of the elbow.
- Treatment depends on the size of the fragment and the stability of the elbow .



Fracture of head of radius

- One of the most common fractures in young adults.
- It is caused by a fall onto the **outstretched hand with pronation**.
- In most cases the fracture is no more than vertical crack without displacement.
- Sometimes the whole of the head is extensively comminuted.



Diagnosis

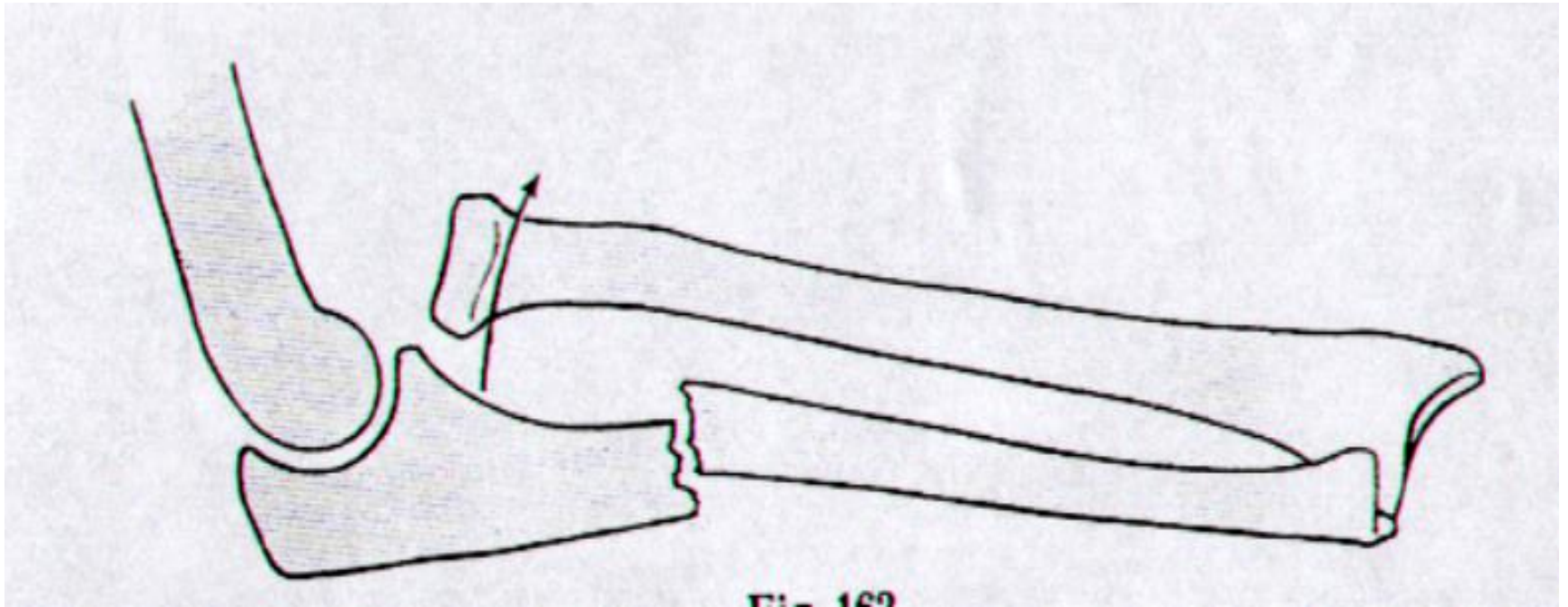
- Local tenderness, restriction of elbow movement (rotation).
- Painful supination .
- **Radiology** : may be easily over looked because it is sometimes not immediately obvious in the radiographs (impacted).

Treatment

- depends upon the severity of the damage :
 - Slight damage: conservative treatment ,sling ,early active exercises .
 - Severe damage: excision of the radial head, after the operation the elbow is rested in plaster for 2 weeks then active exercises are begun.
- **Fracture in children:** reduction by manipulation, excision of the radial head should never be advised in children.
- ❖ **Complications:** joint stiffness- osteoarthritis.



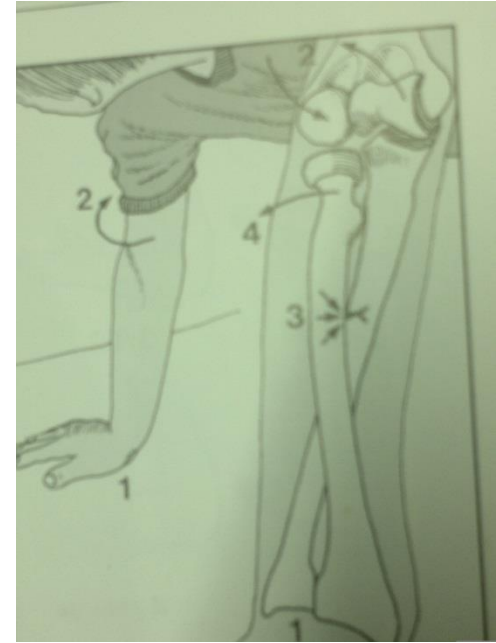
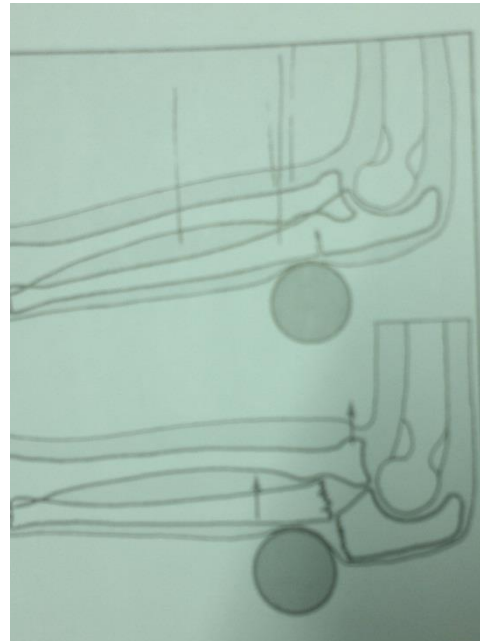
Monteggia fracture - dislocation



Fracture of the ulna with dislocation of the head of the radius

Monteggia fracture - dislocation

- Uncommon
- caused by a fall with **forced pronation of the forearm.**
- Or direct trauma



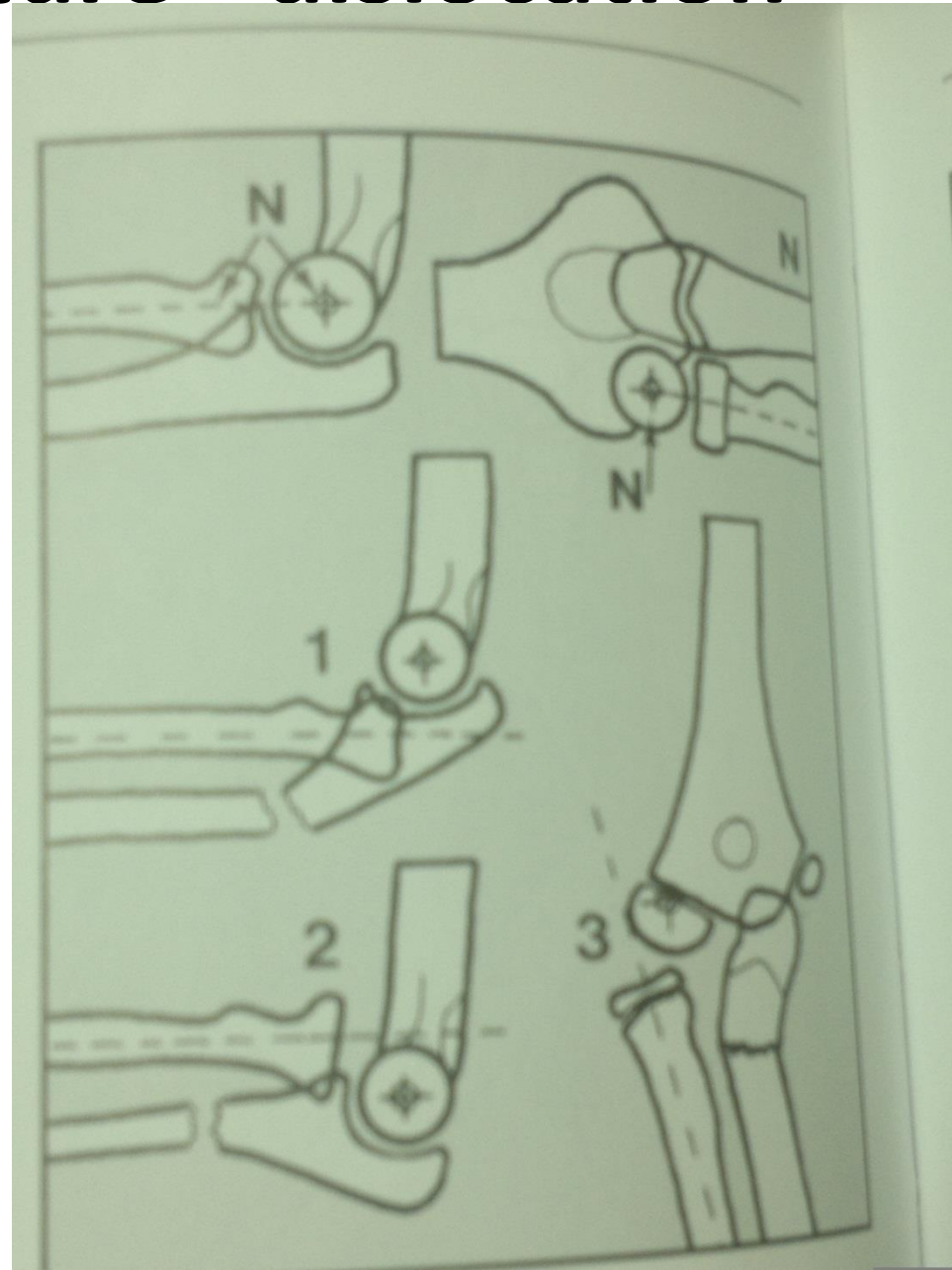
Monteggia fracture - dislocation

- The ulna is angled and the head of the radius is dislocated :

1-posteriorly

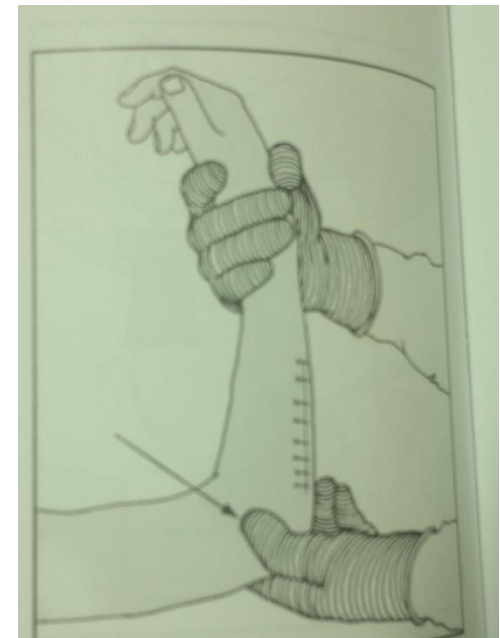
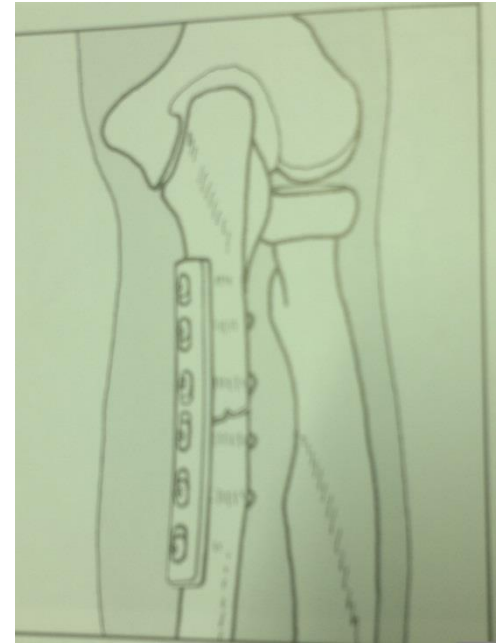
2-anteriorly

3-laterally



Monteggia fracture - dislocation

- **Treatment:** closed reduction is seldom possible.
- Operation is required to reduce and fix the ulna fracture, and reduction of radial head must be checked by palpation and x ray
- a plaster cast at a right angle for 4-6 weeks.
- **Complications:** elbow stiffness , mal-union, compartment syndrome



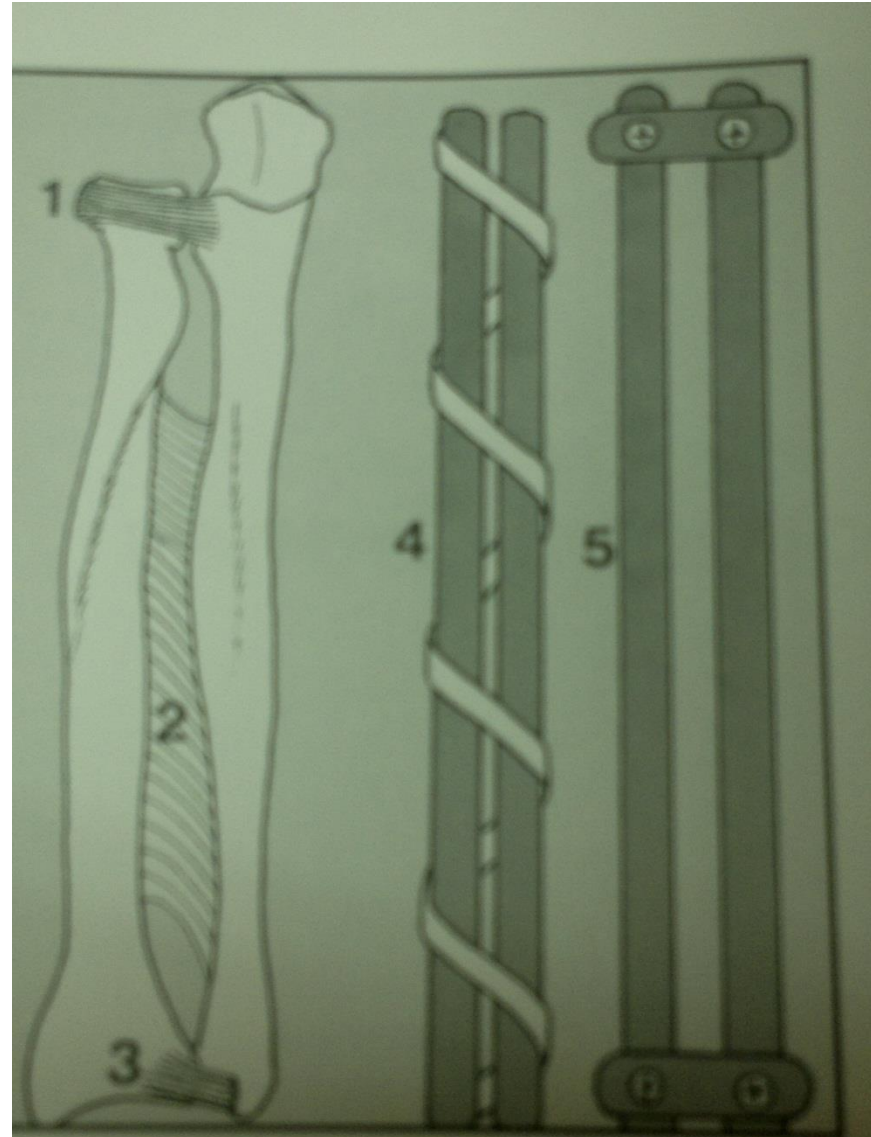
Fracture of the shaft of the forearm bones

Typical fracture of both bones of the forearm with marked displacement



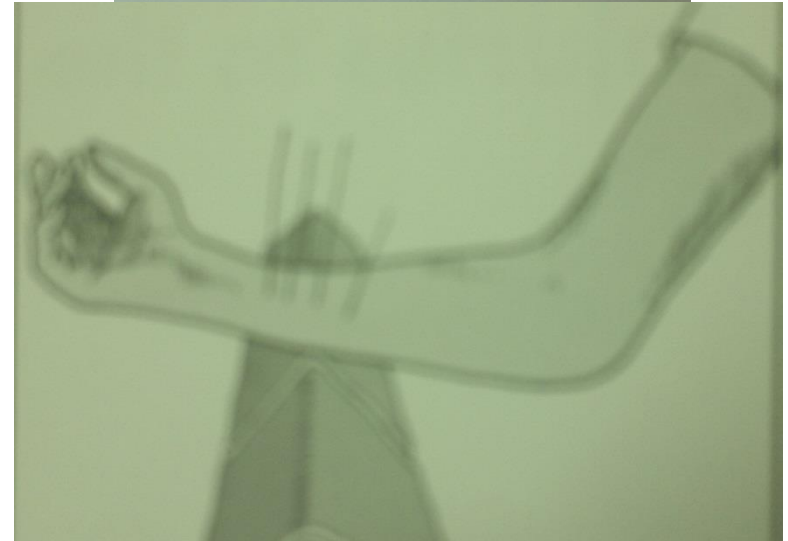
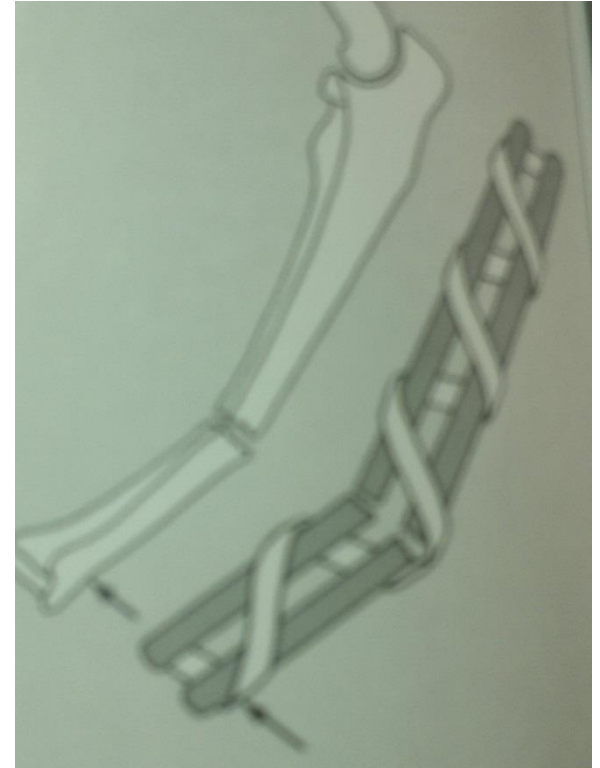
Fracture of the shaft of the forearm bones

- Isolate fracture of ulna or radius is rare.



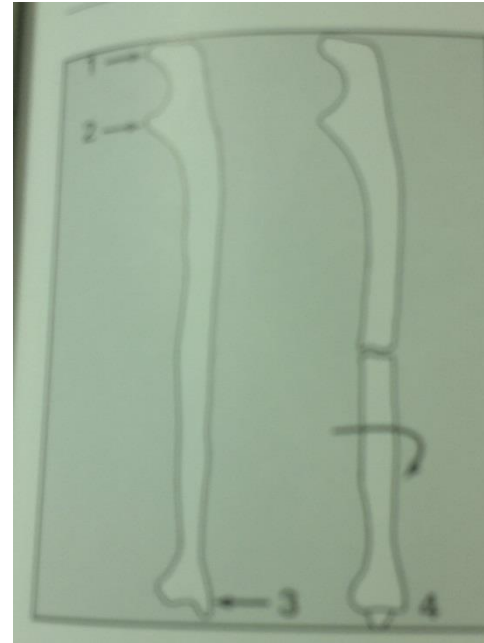
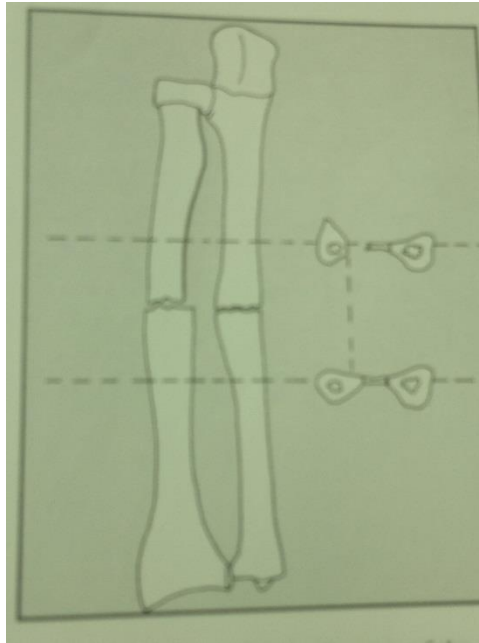
Fracture of the shaft of the forearm bones

- The cause is **indirect** force such as a fall onto the hand
- or a **direct** blow on the forearm



Treatment

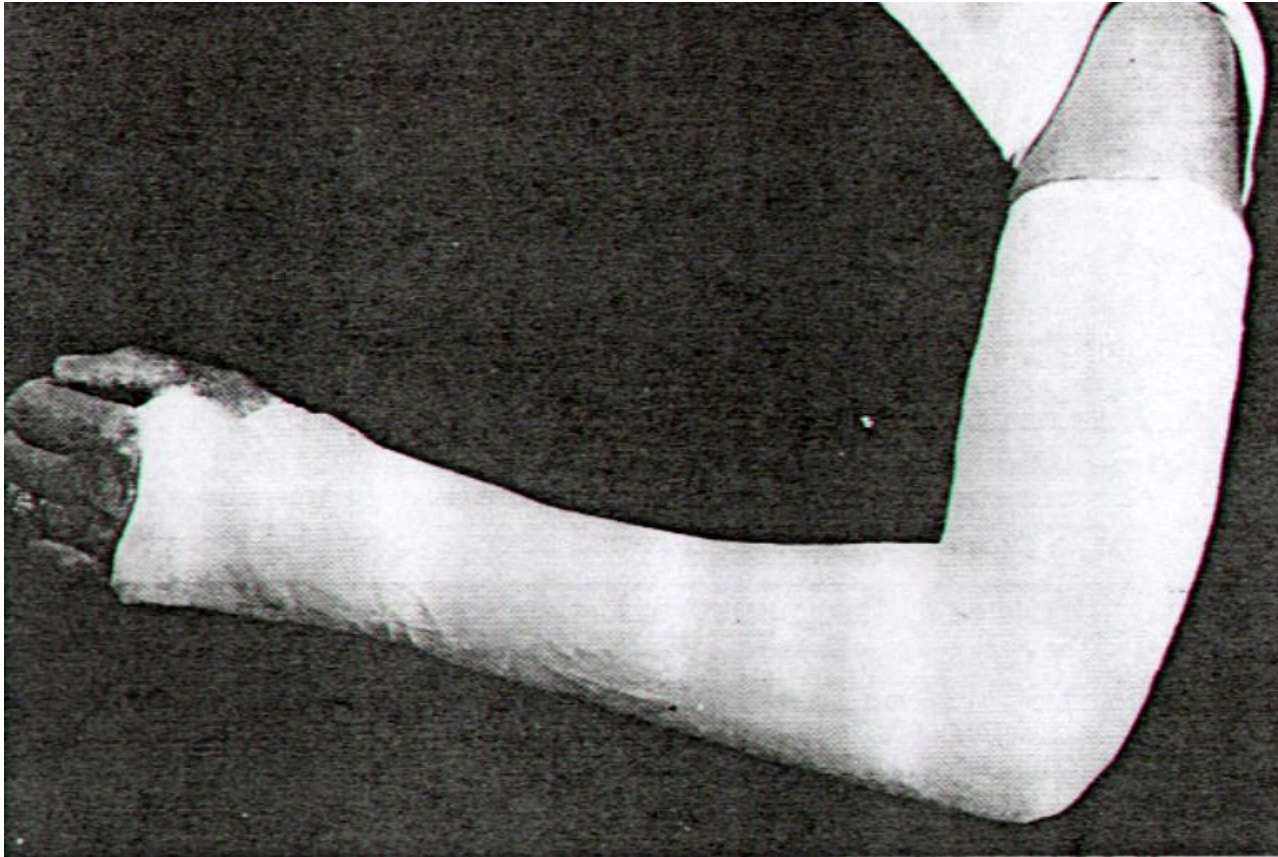
- Accurate reduction is important because even slight residual displacement or angulation may disturb the relationship between radius and ulna.
- **Axial rotation** is unacceptable



Conservation treatment in children

- manipulative reduction under anesthesia.
- If this is successful a full-length arm plaster is applied with the elbow at a right angle and the forearm in a position midway between pronation and supination.
- Radiographs' should be taken weekly for the first 3 weeks, the plaster is retained until union occurs





Full-length arm plaster with elbow
flexed 90 degrees

Operative treatment

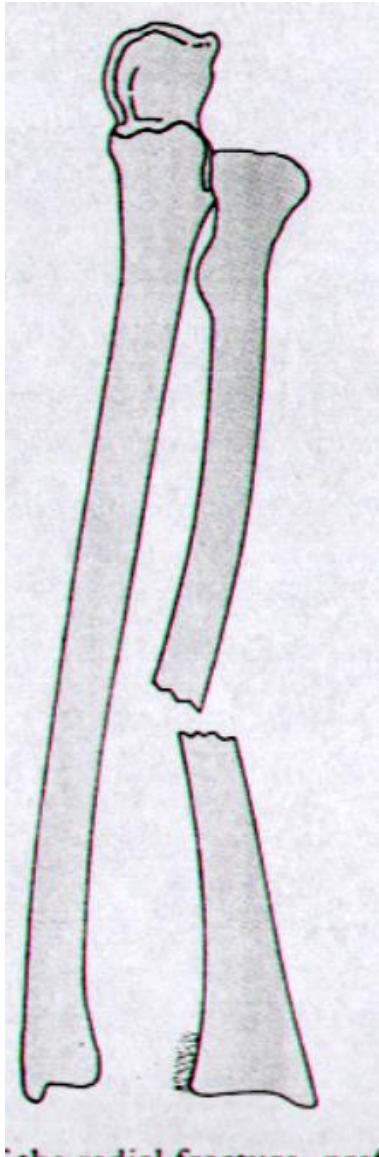
- especially in adults.
- it is very difficult to correct a severe displacement without open operation.



Complications

- **delayed and non-union**, this fracture prone to delayed union or non-union.
- **Mal-union**: if an imperfect position is accepted there is a risk of impaired function (in rotation), angulation of the fragments shortens one of the bones
- **cross union** between bones.

Galeazzi fracture-dislocation



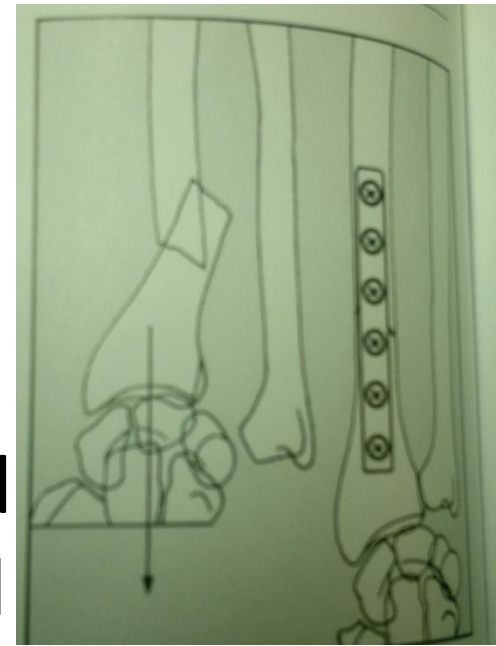
Fracture of the shaft of
radius with dislocation
of the distal radio-ulnar
joint

Galeazzi fracture-dislocation

- Often the fracture is near the junction of middle and lower thirds of the radius ,and the ligaments of the inferior radio-ulnar joint are ruptured.
- The head of the ulna may be shifted medially, anteriorly or posteriorly.
- The Galeazzi fracture - dislocation is more common than the Monteggia fracture - dislocation.

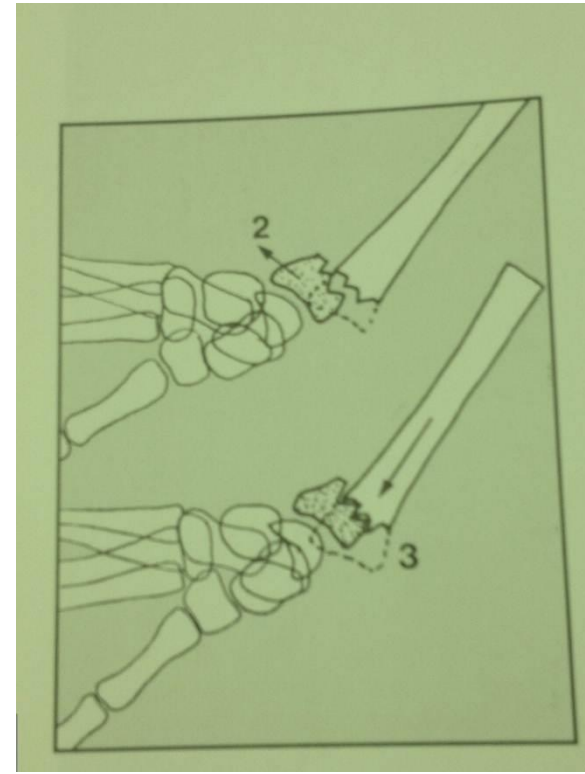
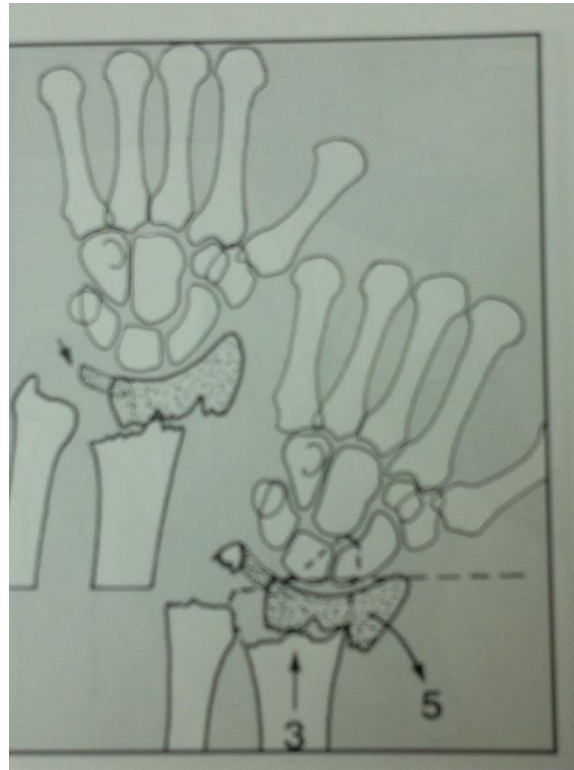
Treatment

- perfect reduction is essential for restoration of full function.
- In adults re-displacement is common after reduction by manual traction and supination, so operative reduction and internal fixation are indicated usually.
- The position is held by a full-length arm plaster with the elbow flexed to the right angle and the forearm supinated.
- the plaster is retained until union occurs.



Colles's fracture

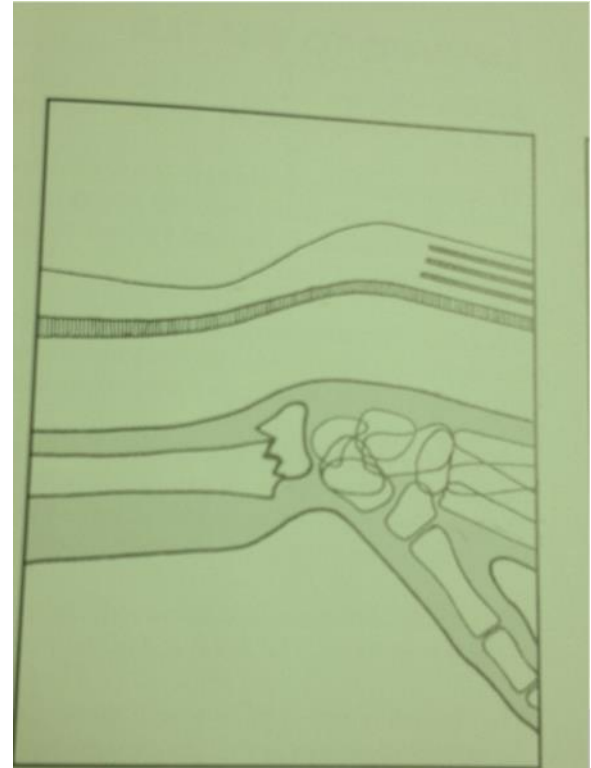
Fracture of the
lower end of
the radius
within 2.5 c m
of the wrist
with dorsal and
radial
displacement
(Typical
Displacement)



Colles's fracture

- **It is the commonest of all fractures .**
- It is not just fracture of lower end of radius , but a **fracture dislocation** of the inferior radio-ulnar joint.
- **Mechanism:** fall on outstretched hand with dorsiflexion.
- Most common in elderly female with osteoporosis
- Pain , tenderness , swelling , restricted motion of wrist and hand , dinner fork deformity.

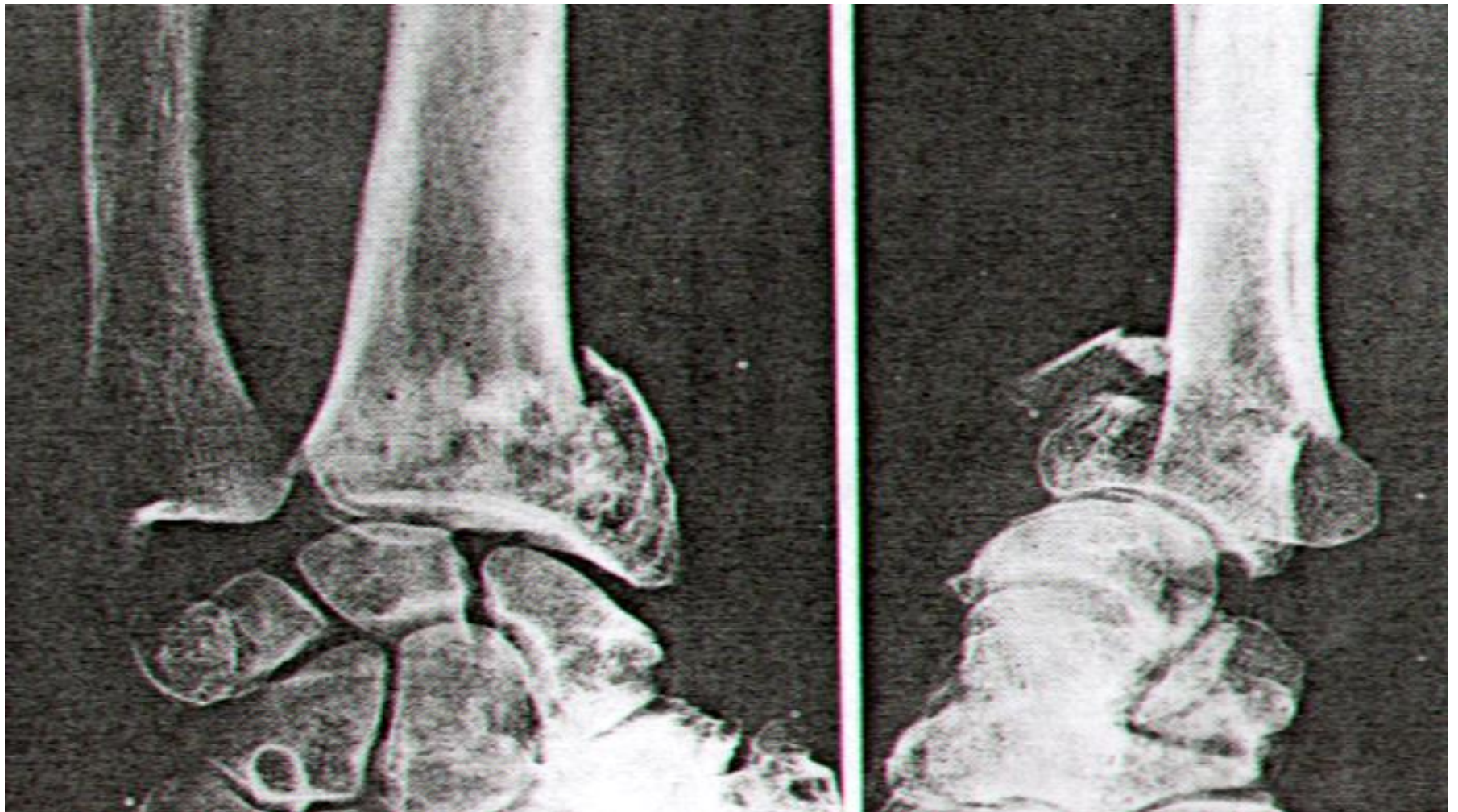
Colles's fracture



Typical deformity (dinner fork) from displaced fracture of the lower end of the radius (Colles's fracture)

Radiology

AP and lateral views of wrist and lower end of the radius.



Treatment

the aim of the treatment is to restore fully functional hand :

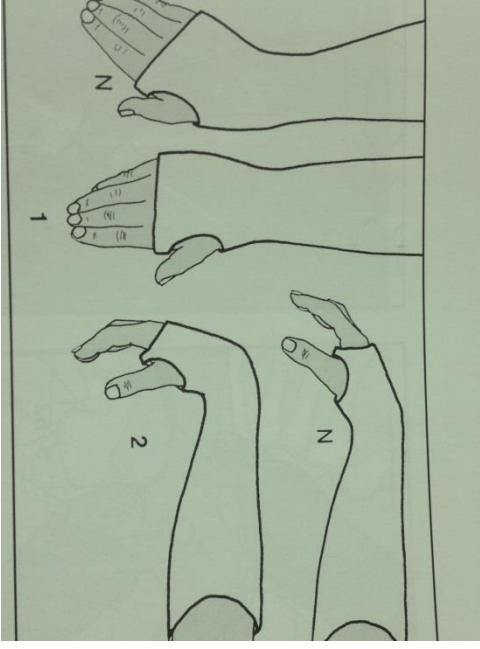
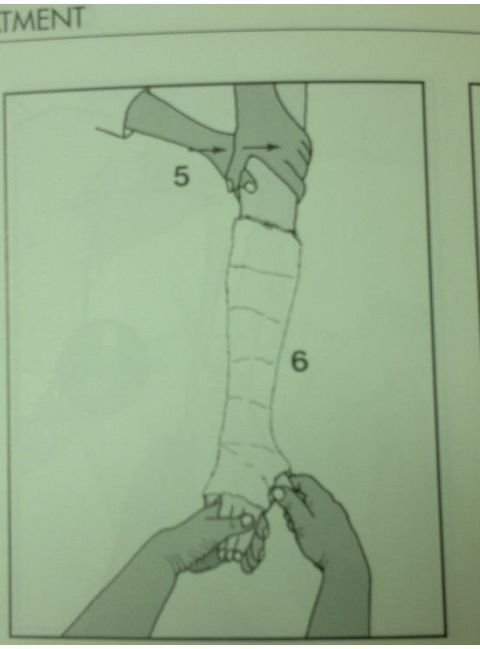
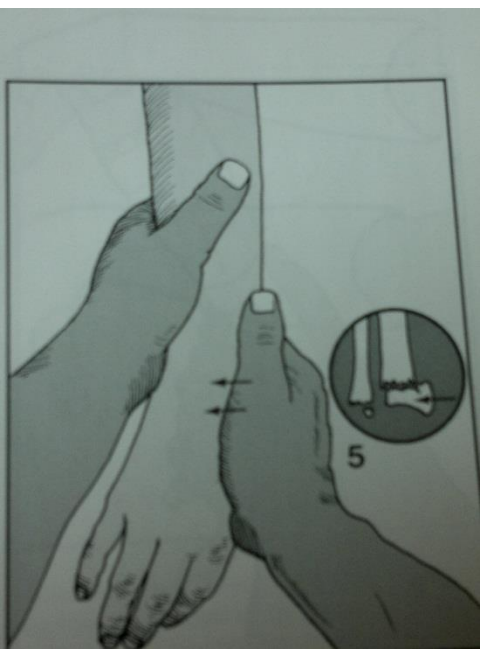
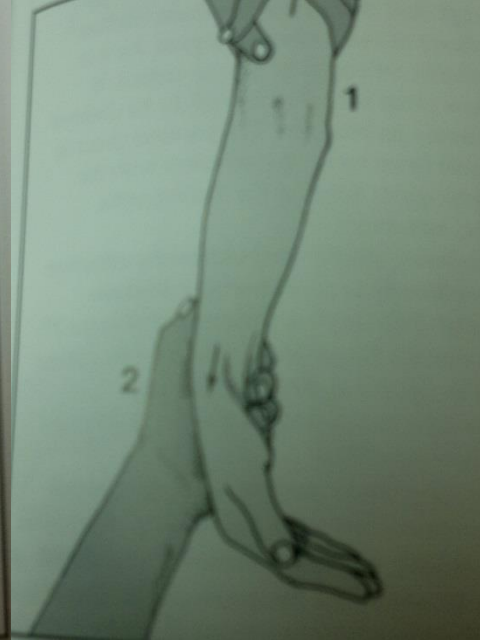
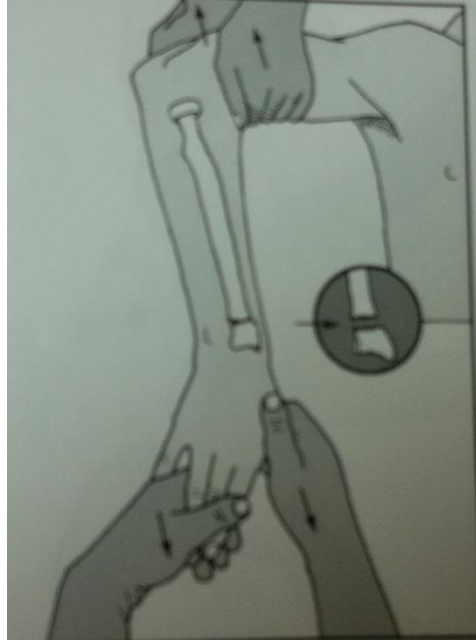
1 - **Conservative methods:** reduction is carried out by closed methods.

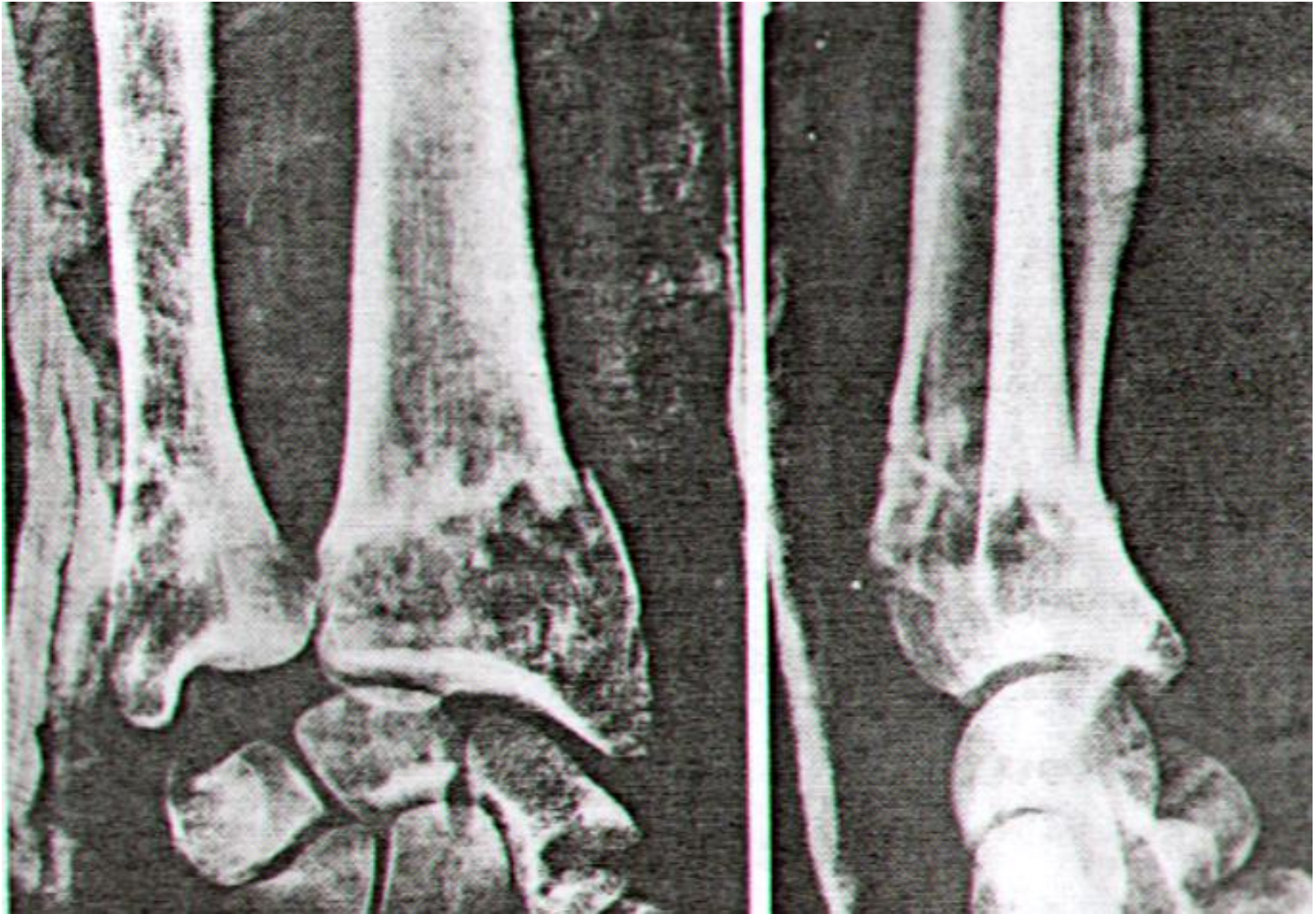
A below elbow or above elbow cast is put and the plaster cast is removed after 6 weeks , and then physiotherapy is begun.

2 - **Closed reduction and percutaneous fixation.**

3 - **Operative methods** (plate and screws , external fixator in severely comminuted fractures).

Reduction and cast



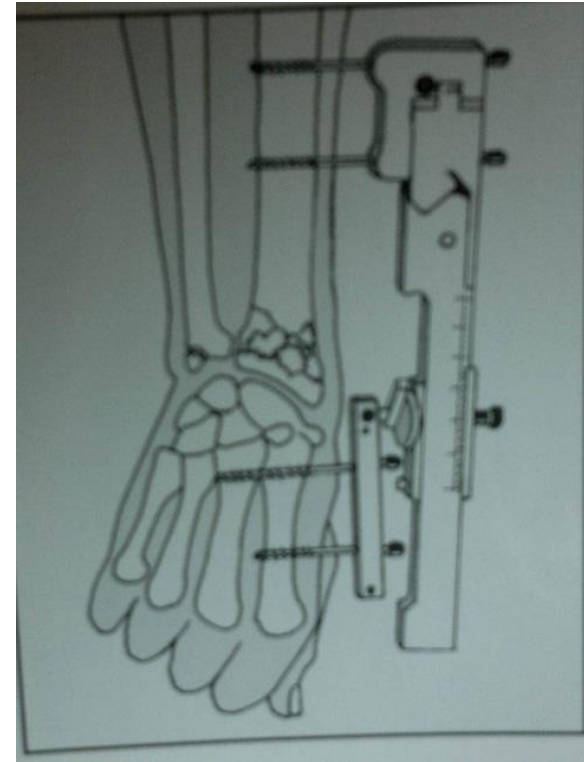


The fracture are seen through plaster after manipulative reduction

Closed reduction and percutaneous fixation



Operative methods (plate and screws , external fixator in severely comminuted fractures).



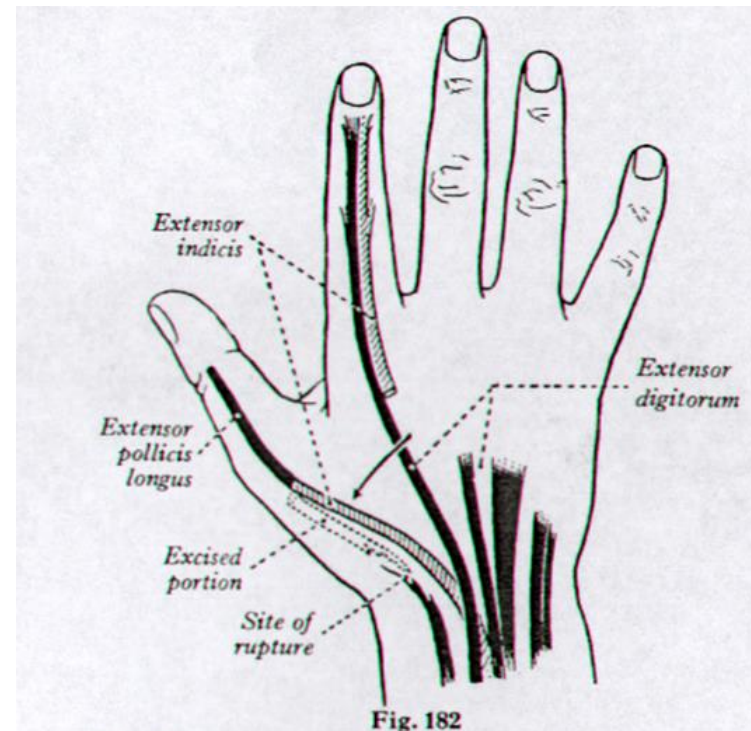
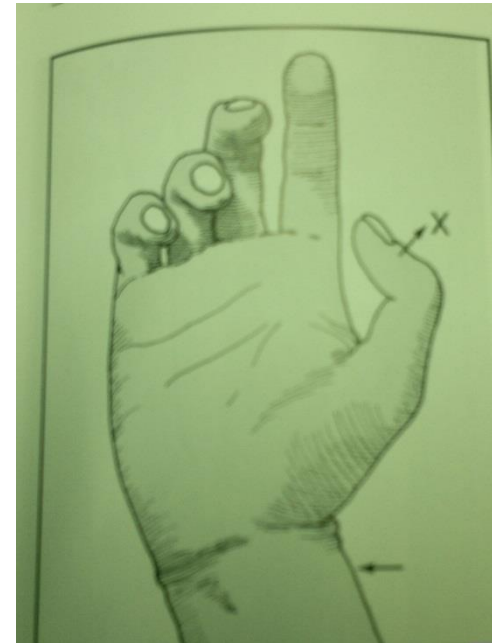
Complications

1 – Mal-union: the most common.

no treatment is required if the patient has no functional abnormality.

2 - Rupture of extensor pollicis longus tendon :

usually occurs after 4 to 6 weeks. Treatment by transfer of extensor indicis to replace the ruptured extensor pollicis longus.



Complications

3 - **Sudeck's atrophy**: due to abnormal sympathetic response which causes vasodilatation and osteoporosis at the fracture region.

The fingers are swollen and fingers flexion is restricted ,the hand and wrist are warm , tender and painful .



Complications

- 4 – associated **scaphoid fracture** .
- 5 - **Frozen hand shoulder syndrome:**
due to unnecessary voluntary
shoulder immobilization.
- 6 - **Carpal tunnel syndrome:**
compression on the median nerve
due to mal-union.
- 7 - **Nonunion:** rare.



Fracture-separation of lower radial epiphysis in a child: (epiphyseal injury)



Fracture of the lower end of radius with anterior displacement

Smith's fracture

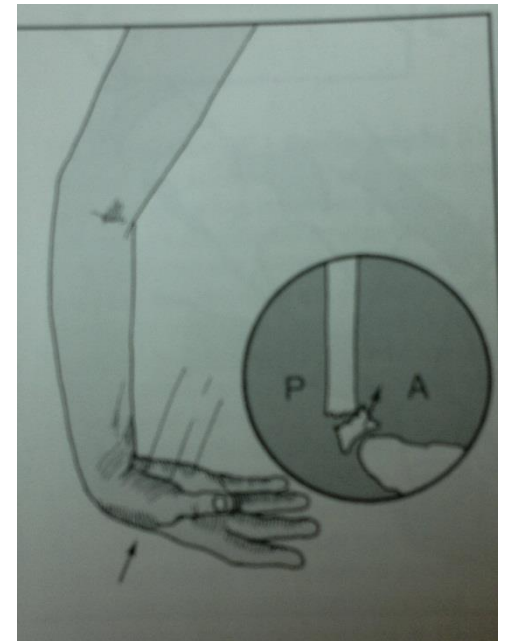


volar Barton's fracture



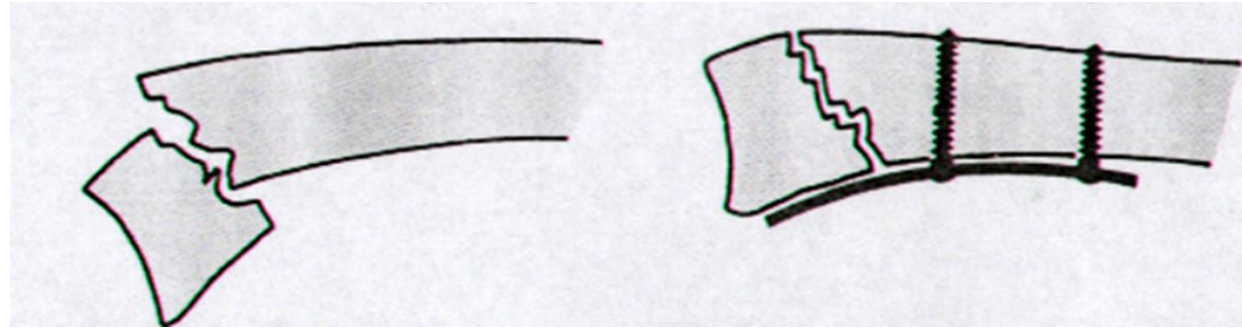
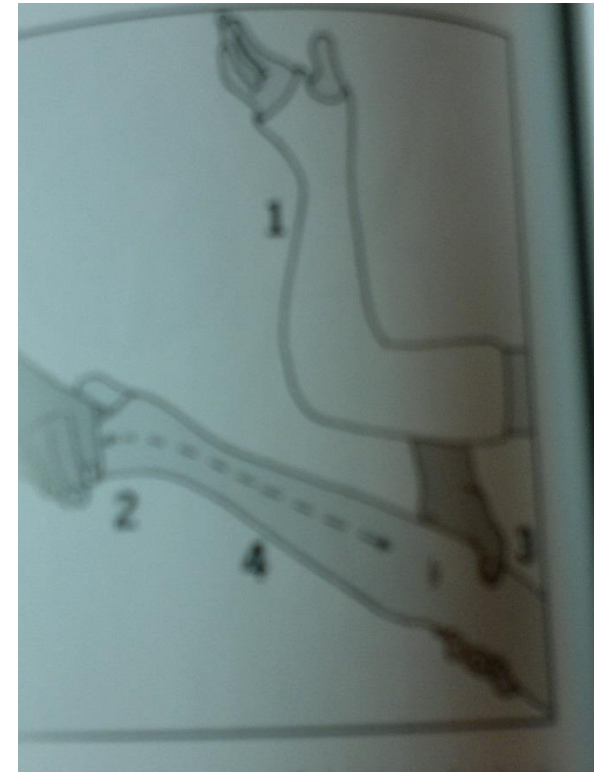
Smith's fracture

- A fracture of distal one-third of radius with palmar displacement.
- Reverse Colles's fracture.
- Less common than Colles's.
- **Mechanism:** fall on the back of the dorsum.
- **Clinical features:** pain , swelling , deformity.
- **Radiography:** anterior displacement of the distal fragment with angulation .



Treatment

- closed reduction and immobilization in a long arm cast with forearm in supination and wrist in extension.
- Or internal fixation .
- **complications :** same in colles's fracture.



Barton's fracture

Dorsal or volar rim could be involved and these fractures are invariably intra-articular.



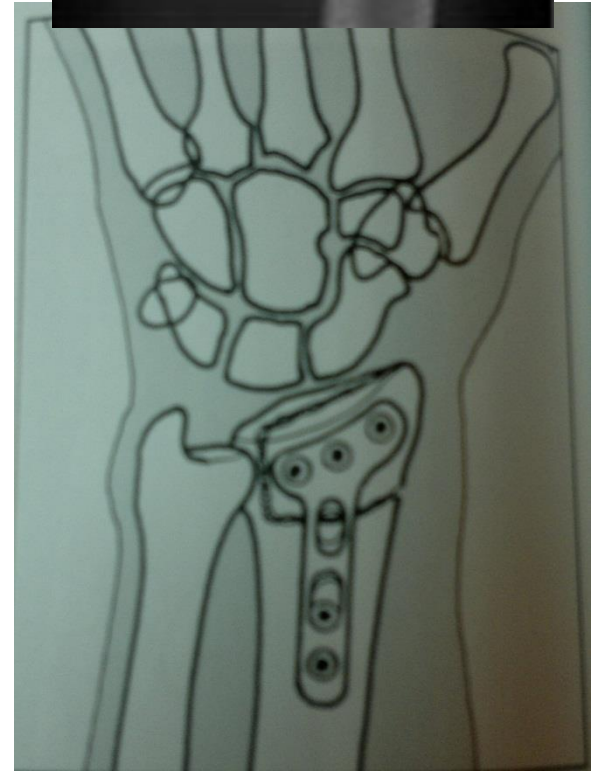
Dorsal Barton

- Dorsal rim fracture of distal radius.
- **Mechanism** : fall with dorsiflexion and pronation.
- **Clinical features**: pain , swelling , tenderness , deformity and painful restrictions of the wrist.
- **Radiology**: fracture is seen on the lateral view.
- **Treatment**:
 - **Conservative** : reduction , long arm cast is used in dorsal flexion (extension) .
 - **Surgery**: unstable fracture is fixed.



Volar Barton

- This is a form of Smith fracture in which the anterior portion only of the radius is involved .
- **Clinical features:** pain , swelling, tenderness , painful restrictions of the wrist.
- **Treatment:**
 - Conservative:** reduction , long arm cast is used in volar flexion.
 - Surgery:** if reduction does not remain (plate & screws).



Carpal injuries

Carpal bones

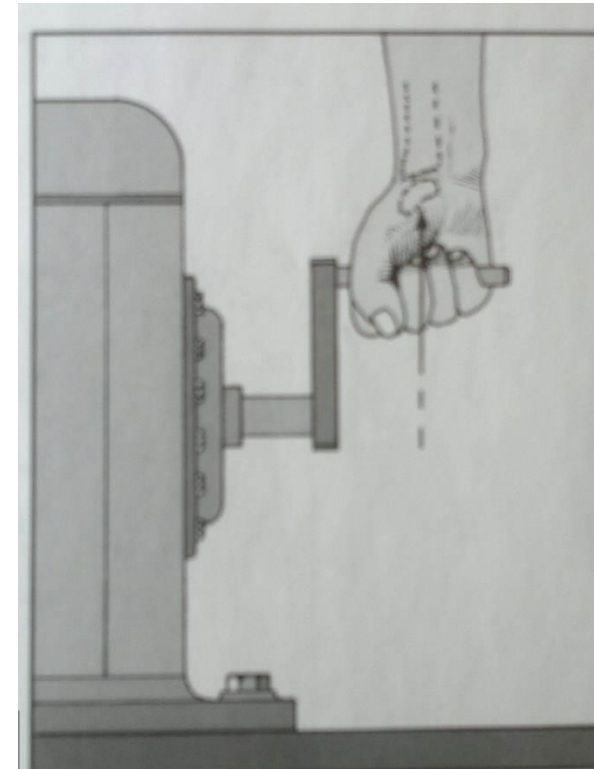
“she looks too pretty try to catch her”

- Scaphoid ,
lunate ,
triquetral ,
pisiform ,
trapezium,
trapezoid ,
capitate
and
hamate.



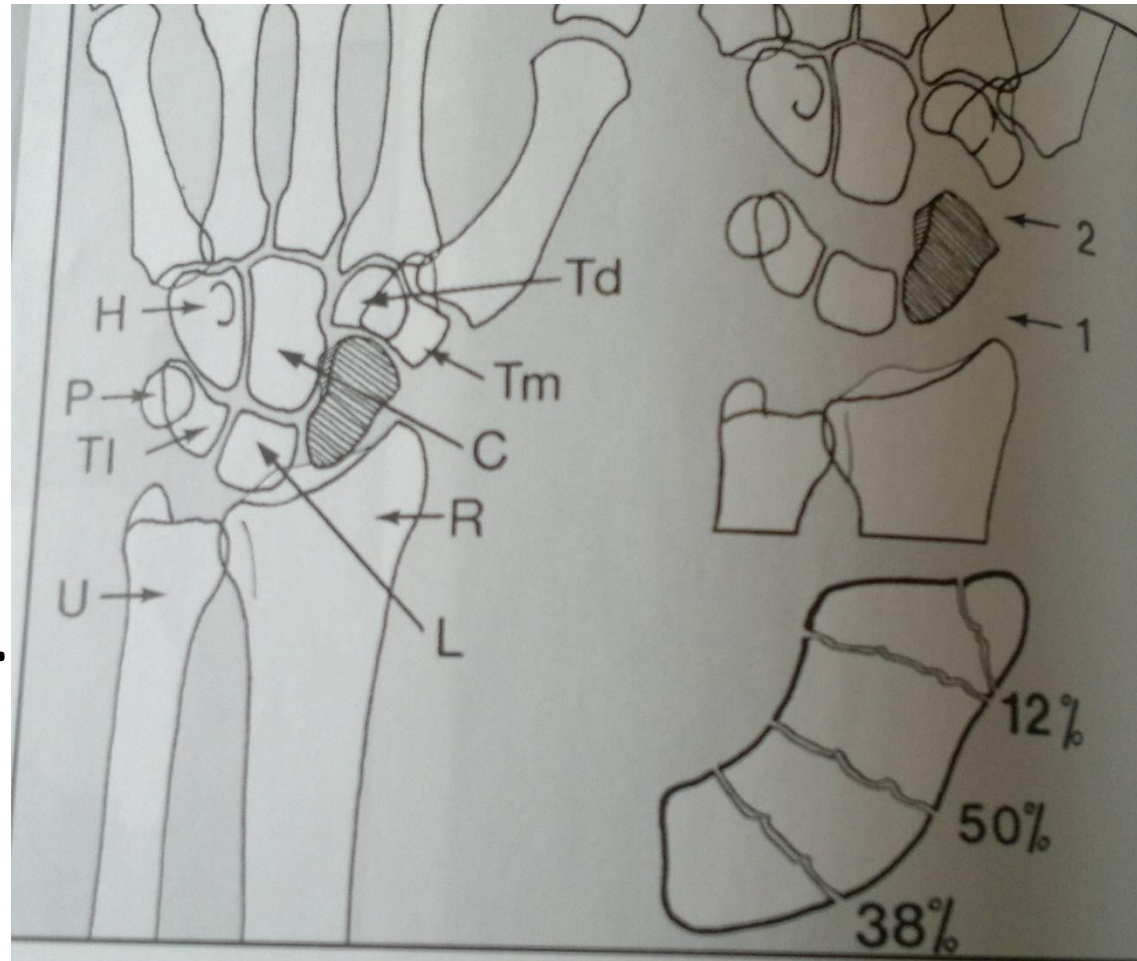
Scaphoid fracture

- It is common in young adults.
- May be associated with other fracture or dislocation of carpus.
- **Mechanisms of injury :**
 - 1 - Results from (KICK –BACK)
 - 2 - Fall on outstretched hand with severe hyperextension.



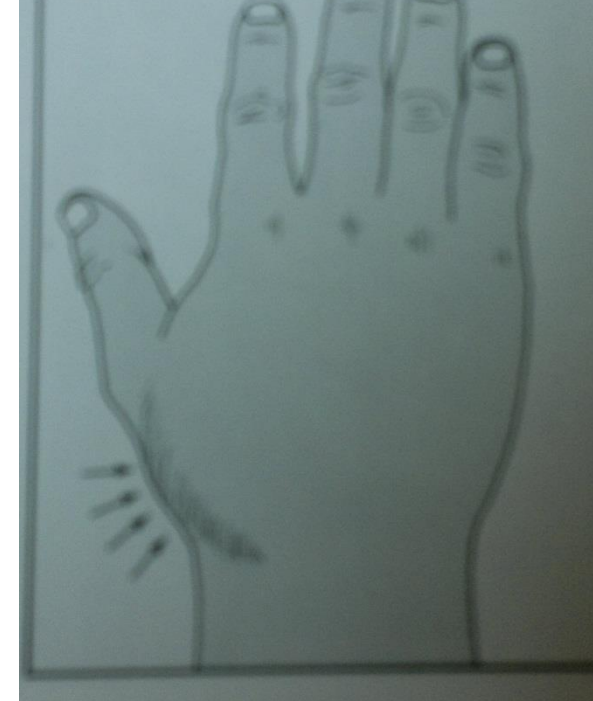
Scaphoid fracture

- ❖ Anatomical classification:
- Proximal pole.
- Waist fracture.
- Distal body fracture.
- Tuberosity fracture.



Scaphoid fracture

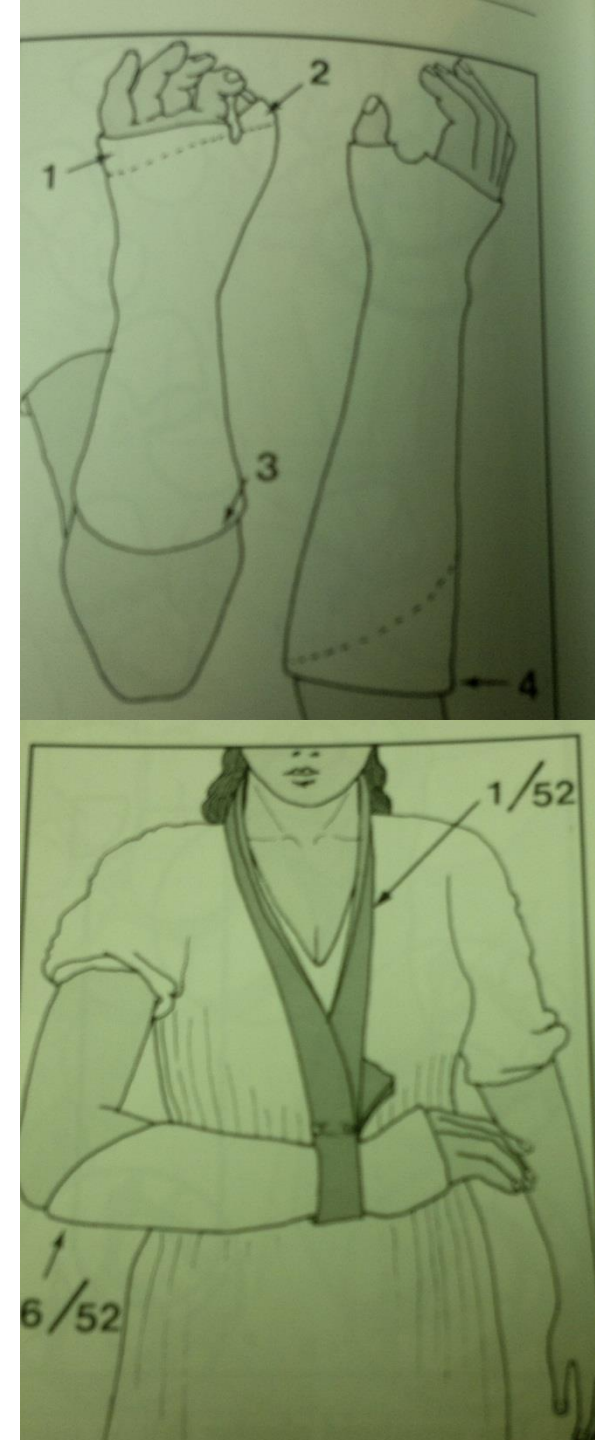
- **Clinical features:**
pain , swelling ,
tenderness in the
anatomical snuff
box , The
movements of the
wrist is painful .
- **Radiology:** AP ,
lateral ,scaphoid
views .



Treatment:

Undisplaced fracture

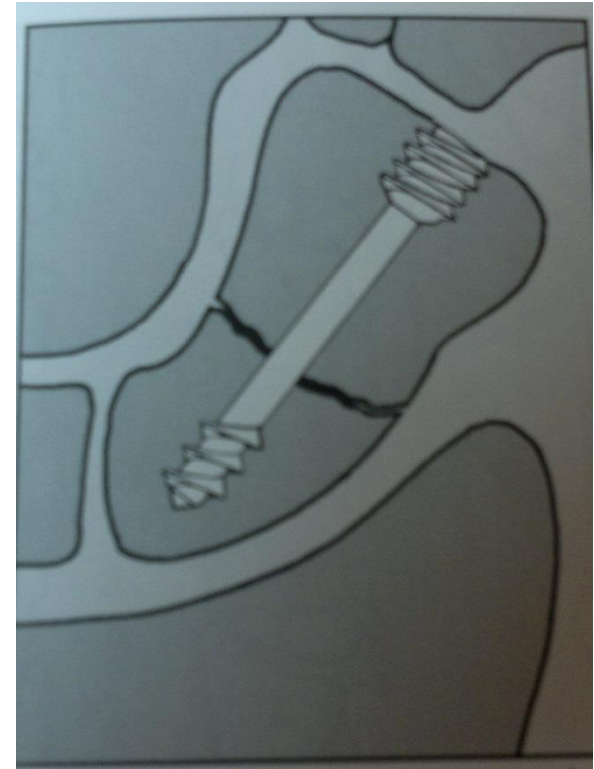
- **conservative** : below elbow cast applied to the level of metacarpal heads of fingers and interphalangeal joint of the thumb.
- Position assumes a glass-holding .
- Duration of cast : 10 – 12 weeks .



Treatment:

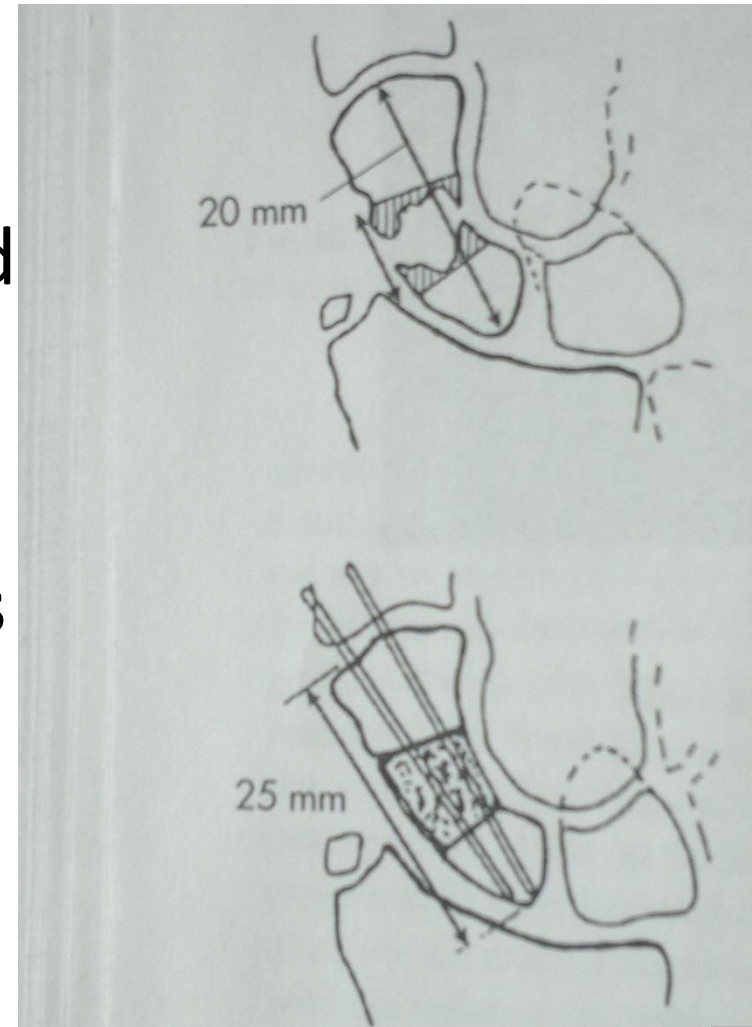
Displaced fractures

- **closed reduction** and immobilization with scaphoid cast.
- **Open reduction** and internal fixation (Herbert screw).



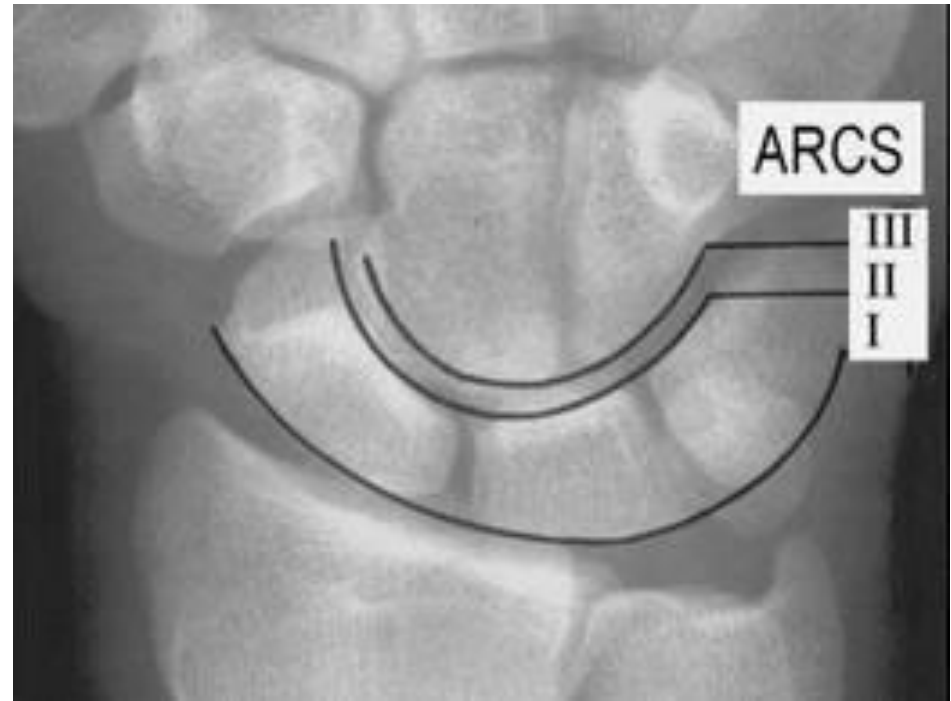
Complications

- **nonunion and delayed union :**
nonunion requires open reduction , internal fixation and bone grafting.
- Incidence of **avascular necrosis** is as high as 40 percent , especially in proximal pole .
- Secondary Radio-carpal joint **osteoarthritis** .



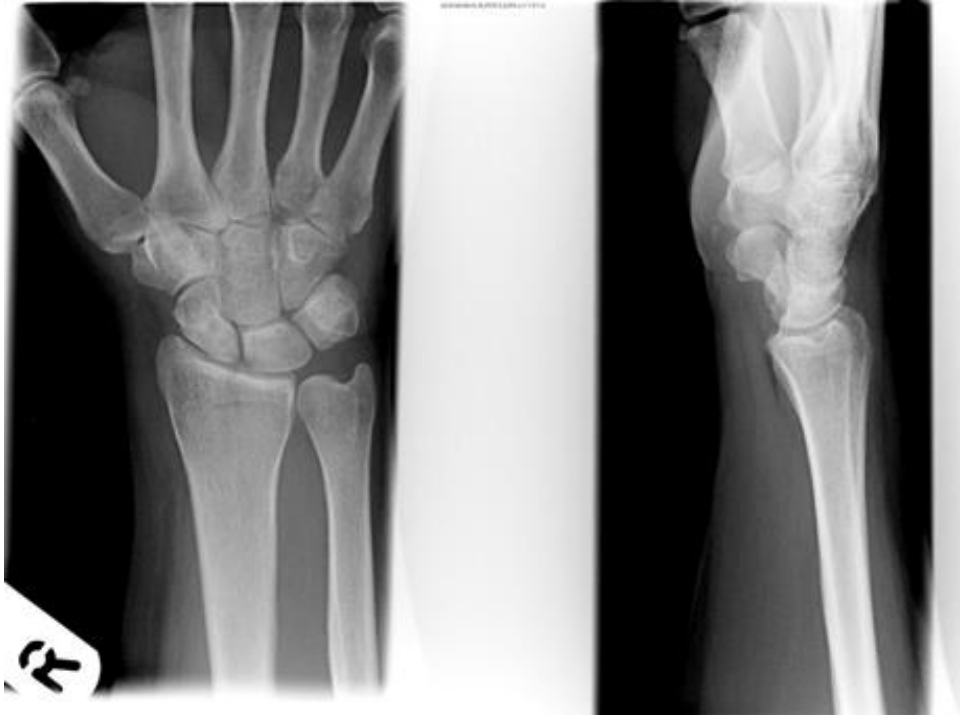
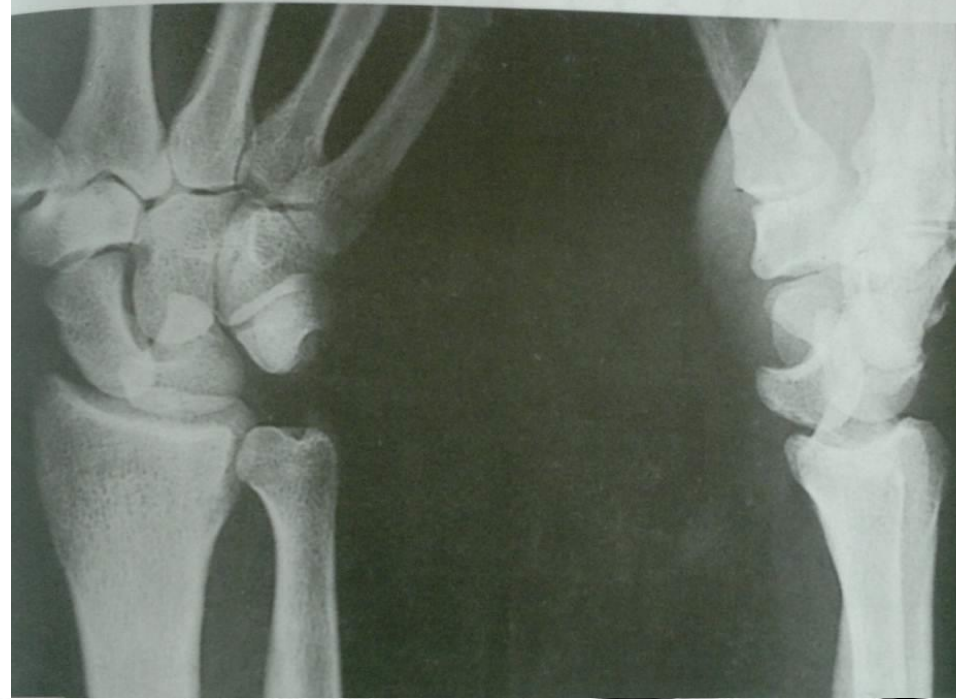
Lunate fracture and dislocation

- **Mechanism:** this is almost similar to scaphoid fractures.
- **Clinical features:** pain , swelling , painful movements.
- **Radiology:** easily diagnosed , the wrist normally forms a half moon shape , This is lost in dislocation.



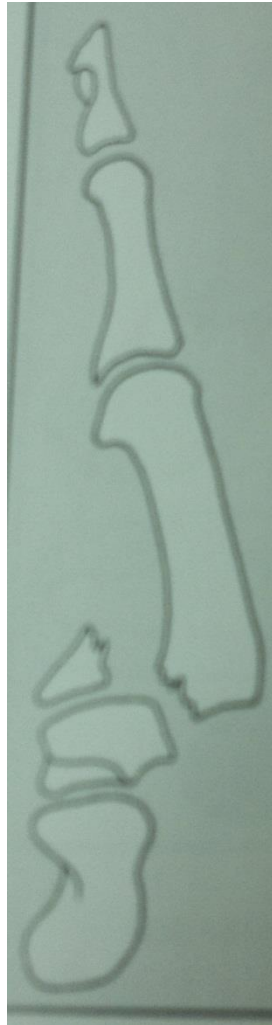
Lunate dislocation

- **Problems:** may cause compression of the median nerve if left untreated.
- **Treatment:** if seen early, reduction is easy and immobilization for 3 weeks with wrist in slight flexion.
- If seen after 3 weeks, open reduction.



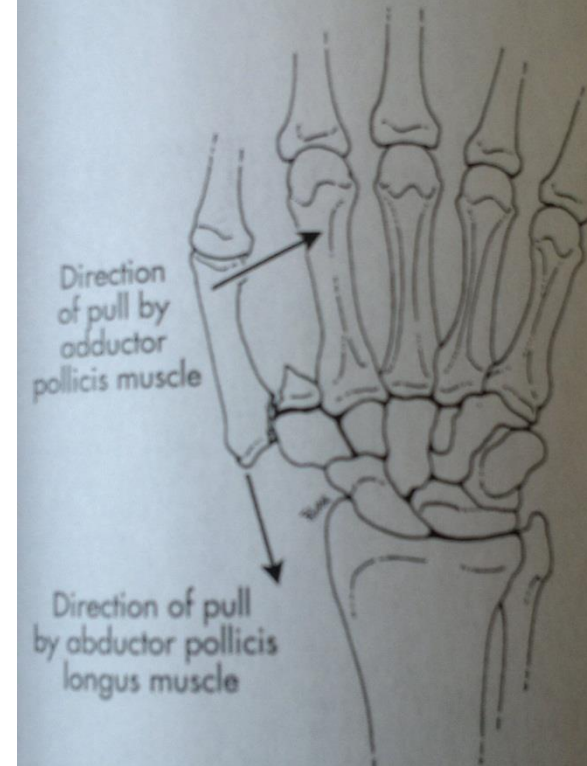
Bennett's fracture

- Fracture dislocation of the base of the first metacarpal bone.
- It is an intra-articular fracture.
- **Mechanism of injury:** an axial blow directed against the partially flexed metacarpal.
- **Clinical features:** pain , swelling , tenderness on the base of first metacarpal , movements of the thumb are painful and restricted.



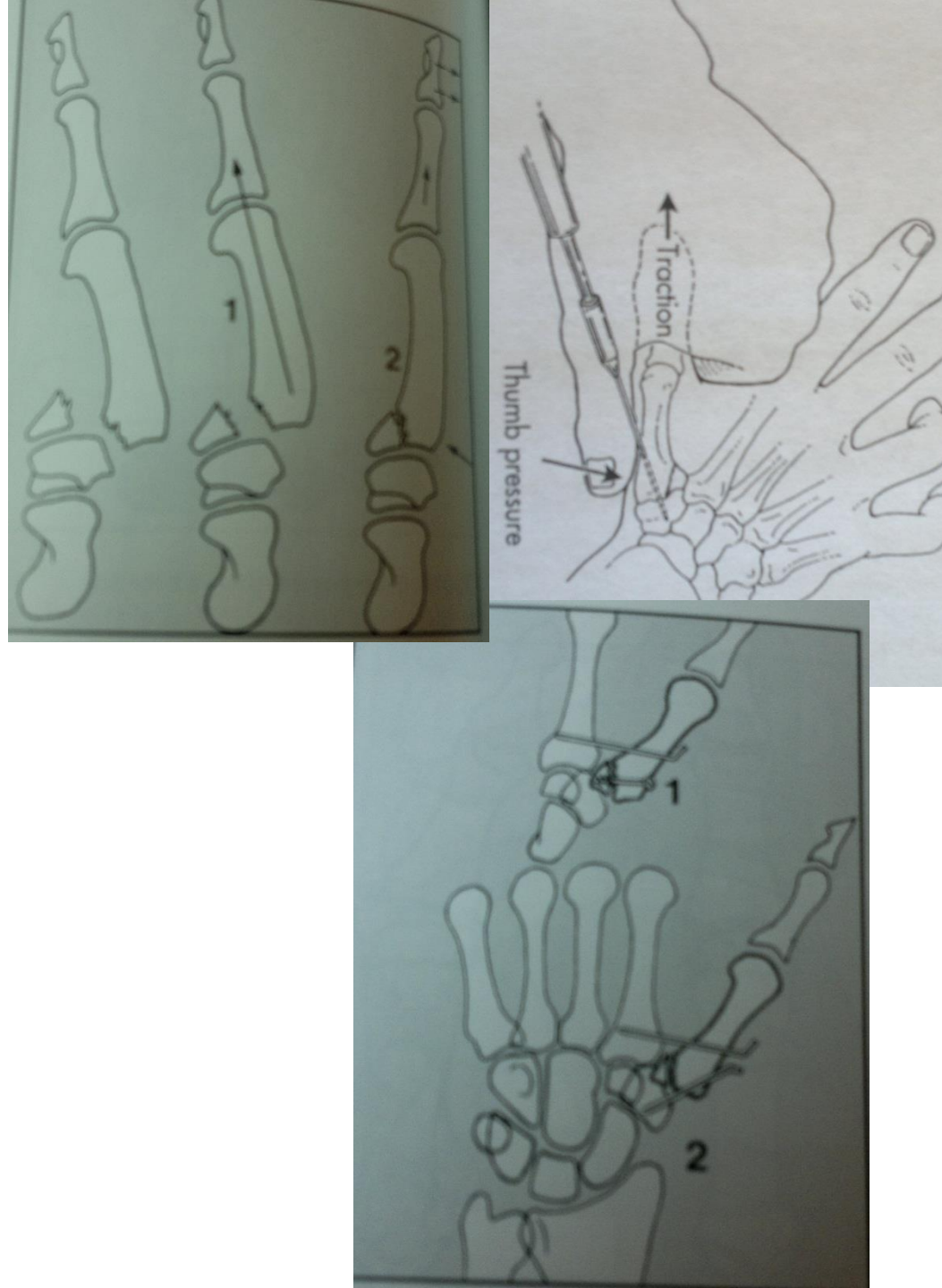
Bennett's fracture

- Peculiarity of this fracture: base of the thumb metacarpal is pulled proximally and laterally by the abductor pollicis longus .
- **Radiology** : shows the displacement



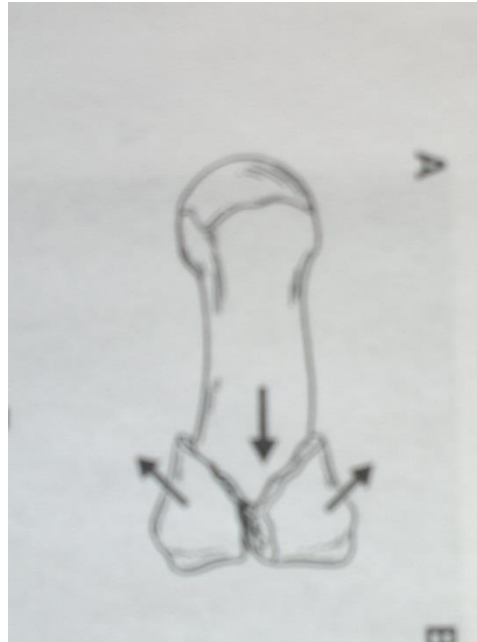
Treatment

- Like all the other intra-articular fractures, it needs accurate reduction and retention to prevent future posttraumatic osteoarthritis.
- Closed reduction and a percutaneous fixation .
- If it fails ORIF.



Rolando fracture

- This is also a fracture of the base of the first metacarpal .
- Closed reduction with a thumb spica.
- If failed , ORIF using small special plate and screws .

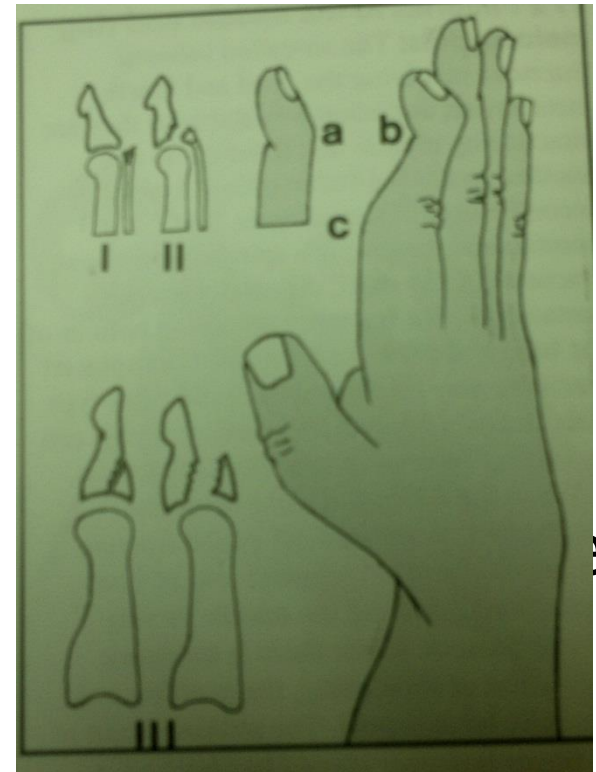


Complications

- both bennett's and rolando fractures could lead to secondary OA of the carpometacarpal and joint stiffness.
- Rarely injury of sensory branch of the radial nerve during surgical intervention.

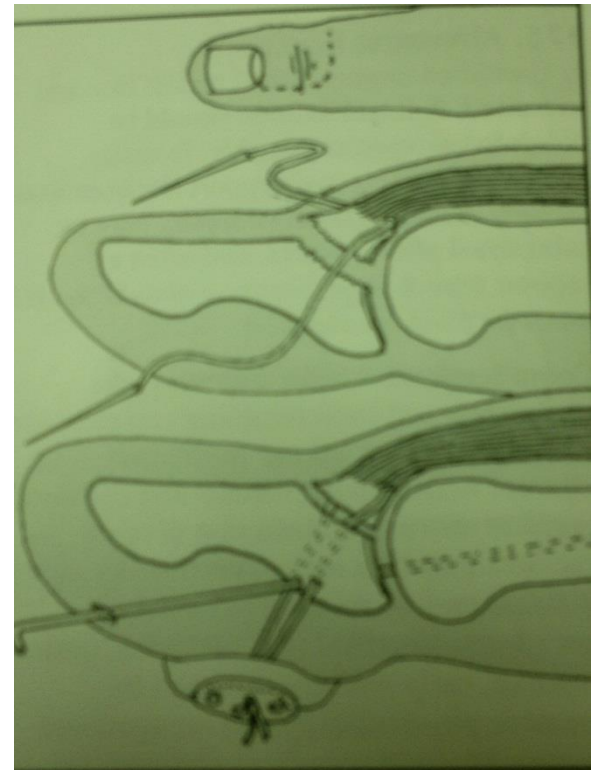
Mallet finger

- It is a common finger injury and is due to avulsion or avulsion fracture of the extensor tendon at the base of the distal phalanx.
- **Mechanism:** is forcibly flexed.
- **Clinical features:** pain , swelling , tenderness , flexion deformity of tip of the finger.
- **Plain X-ray** may show an avulsion fracture.



Treatment

- immobilized in extension by using a stack plastic mallet finger splint ,
- or surgical treatment if bony fragment is big (K . Wire or suturing) .



Jersey finger

- It is a due to avulsion of flexor digitorum profundus from its insertion on distal phalanx.
- Patient is unable to flex the distal interphalangeal joint.
- It is seen in football and rugby.

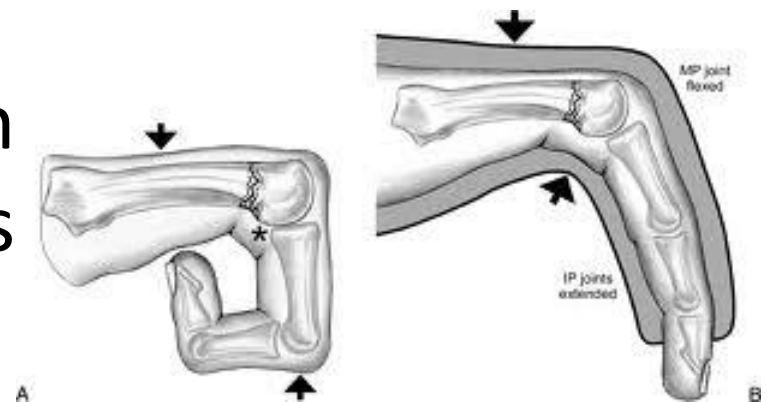
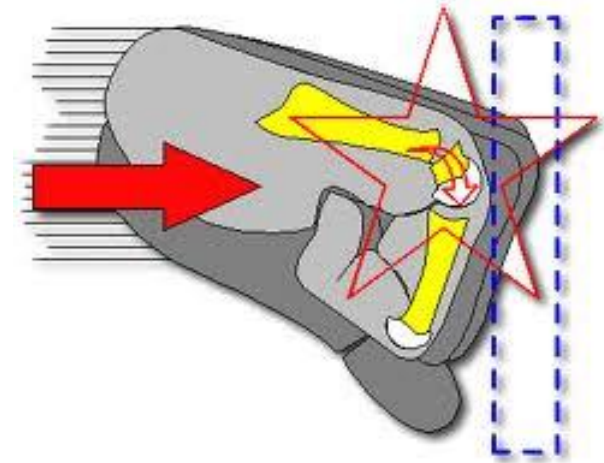
Metacarpal bones fracture

- Common causes for these injuries are direct hit on the dorsum of the hand.
- Plain X-ray.
- These fractures should be accurately reduced with no rotational mal-alignment and immobilized with either plaster (common) or percutaneous k. wires or open (k. wires or plates) .



Metacarpal neck fracture

- The most common is Fracture of the fifth metacarpal neck is known as boxer's fracture.
- **Treatment:** closed reduction and may need percutaneous fixation.



Metacarpal head fracture

Frequently intra-articular and need open reduction and internal fixation.



Phalanges fracture

- **Fracture of distal phalanx:** caused by crushing injuries, they are frequently comminuted and require only splinting.
- **Fracture of the middle or proximal phalanx:** direct blow , rotational mal-alignment should be strictly avoided.
- Undisplaced fractures are best managed by the unaffected finger is used as the supporting external splint.
- Highly unstable oblique fracture require reduction and fixation.

Complications

The important complications are :

- non-union
- mal-union
- tendon adhesions
- joint stiffness .

The end