

# Supracondylar fracture of the humerus

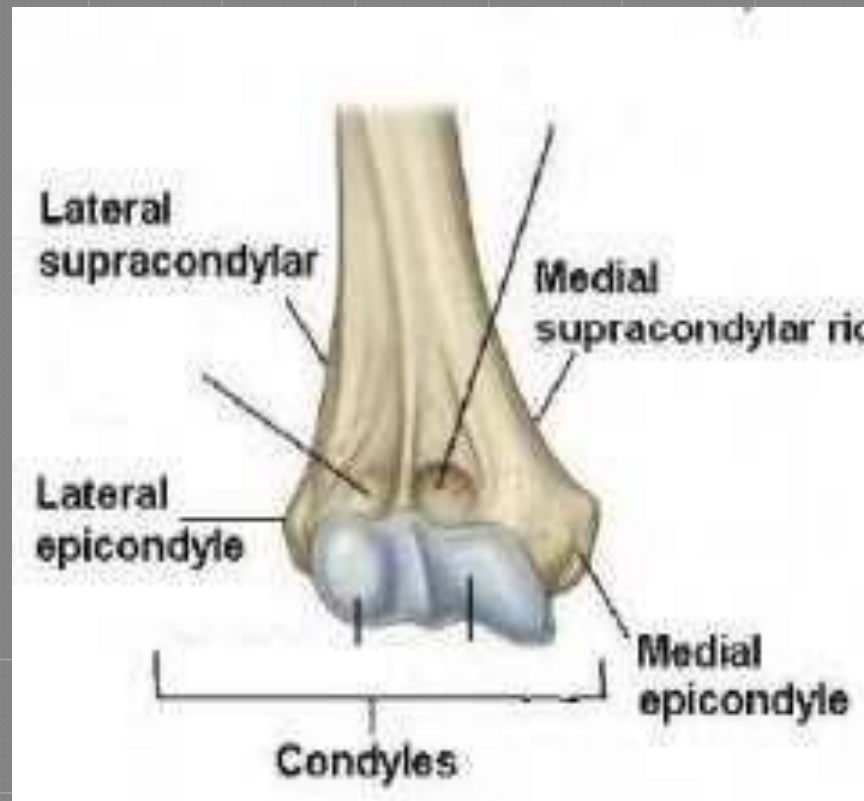
Dr. NIKHIL BHANDARI  
ASSITANT PROFESSOR  
DEP OF ORTHOPEDICS  
MIMER Medical College  
Talegoan Dabhade Pune

# introduction

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- Commonest fracture in children. Uncommon after the physes have closed.
- Also called Malgaigne's fracture.
- The humerus breaks just above the condyles.

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- The distal fragment may be displaced either posteriorly or anteriorly.
  - Common in boys.
  - Types– flexion & extension (90%).



# Mechanism of injury

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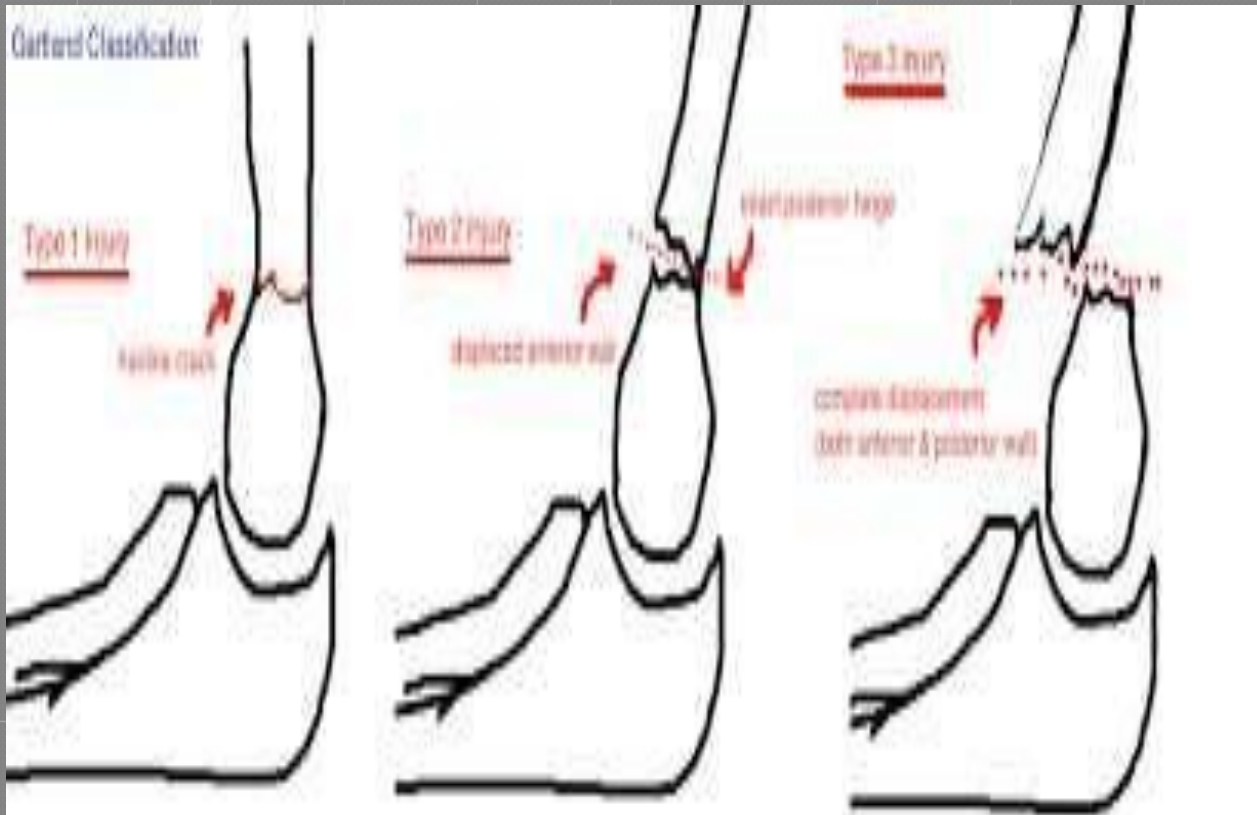
- Fall on the outstretched hand with forearm in pronation.
- The distal fragment is pushed backwards and twisted inwards.

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- Posterior angulations or displacement suggests a hyperextension injury (common).
  - Anterior displacement is due to direct fall on the point of elbow with joint in flexion (rare).

# Classification (Gartland)

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- Type I – an undisplaced fracture.
- Type II – an angulated fracture with posterior cortex still in continuity.
  - IIA – a less severe injury with the distal fragment merely angulated.
  - IIB – a severe injury; the fragment is both angulated and malrotated.
- Type III – a completely displaced fracture.





# Clinical features

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- History of fall.
- Pain in the elbow.
- Elbow is swollen and tender.
- S-deformity of the elbow (posterior).
- Bony landmarks are abnormal.

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- Both active and passive movements of the elbow are decreased.
  - Assessment of the neurovascular status.
  - Relationships between the tip of the olecranon and the epicondyle are normally aligned.

# displacements

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- Posterior tilt and shift
- Proximal shift
- Medial tilt
- medial / lateral shift
- Internal rotation

# investigations

## X - ray

### Radiographic anatomy



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- seen clearly in lateral view.
  - Fat pad sign in undisplaced fracture.
  - Posteriorly displaced – fracture line runs obliquely downwards and forwards and distal fragment is tilted backwards or shifted backwards.

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- Anteriorly displaced – fracture line runs downwards and backwards and distal fragment is tilted forwards.

- Anterior humeral line :  
On a normal lateral x-ray, a line drawn along the anterior cortex of the humerus should cross the middle of the capitulum.



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- Normal Baumann's angle is less than 80 degrees.
  - Fish tail sign
  - Crescent sign
  - Coronoid line





# treatment

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## UNDISPLACED

- The elbow is immobilized at 90 degrees and neutral rotation for 3 weeks.

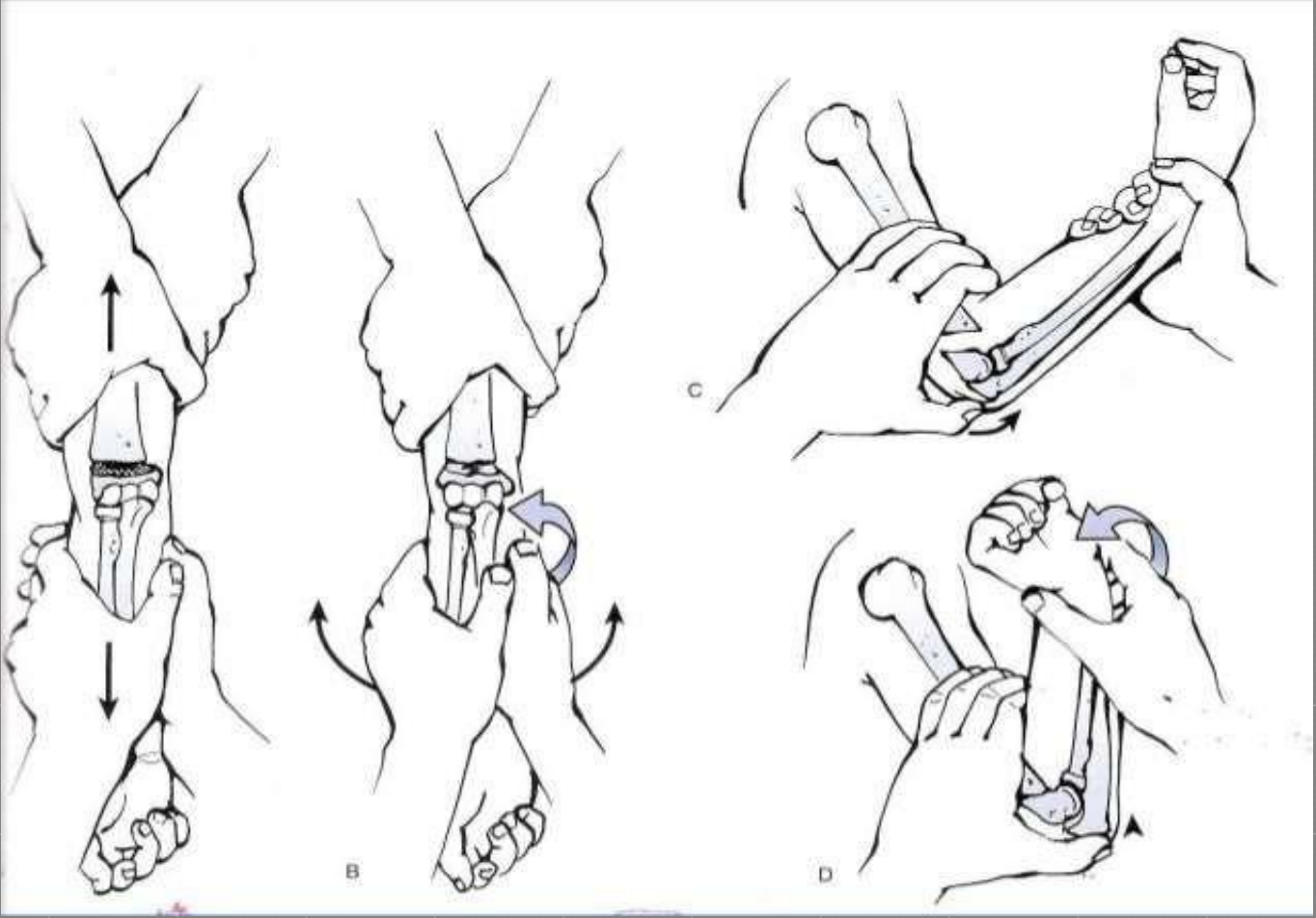
## MILD POSTERIORLY ANGULATED

- Reduction under anaesthesia.
- If the reduction is unstable, the fracture should be fixed with percutaneous K-wires.
- Immobilized for 3 weeks

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## ANGULATED AND MALROTATED OR POSTERIORLY DISPLACED

- Usually associated with severe swelling, often unstable, risk of neurovascular injury.
- Reduced under general anaesthesia and then held with percutaneous K-wires.



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## ○ Open reduction –

- i. When fracture cannot be reduced closed;
- ii. An open fracture;
- iii. A fracture associated with vascular damage.
- iv. Interposition of the biceps

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## SKELETAL TRACTION with an olecranon pin

- i. Reduction cannot be achieved and manipulation is necessary.
- ii. Excessive swelling and circulatory compromise.
- iii. Inherently unstable fracture.

## Pin fixation options :

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- i. 2 lateral pins
- ii. 2 crossed pins
- iii. 2 lateral and 1 medial pins

## Contraindications

- i. Severe swelling
- ii. Open fracture
- iii. Irreducible fracture
- iv. Late diagnosis



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## FIXATION WITH PLATE AND SCREWS

- i. Cannot be reduced by closed measures
- ii. Wound is compound
- iii. Concurrent neurovascular injury
- iv. Concurrent forearm fracture
- v. If prolonged immobilization is to be avoided.



# complications

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## EARLY-

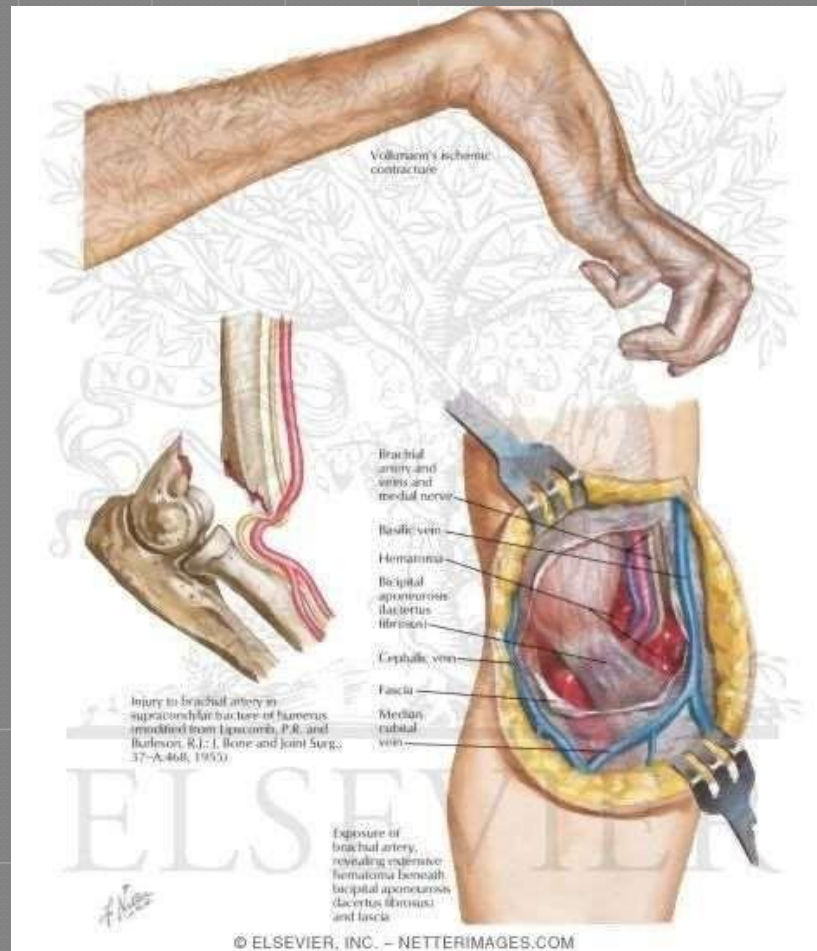
- Vascular injury- brachial artery
- Nerve injury- anterior interosseous n., > median n. > radial n. > ulnar n.
- Volkman's ischemia & compartment syndrome



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## LATE–

- Malunion– uncorrected sideways tilt and rotation may lead to varus or valgus deformity. Gun stock deformity
- Elbow stiffness
- Myositis ossificans.
- Tardy ulnar nerve palsy
- Nonunion – least common



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*Thank you..*