

# Trauma Skeletal Radiology

A Practical Guide

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# Systematic Film Evaluation

- Alignment
- Bones
- Cartilage
- Soft Tissue

**Evaluate the ABC'S!**

# Alignment

- Bowing
- Normal position of bones
- Spaces between bones
- Symmetry
- Angulations

# Bones

- Anomalies in the cortex, breaks, overlaps & steps.
- Changes in trabecular pattern
- Changes in densities
- Periosteal Reaction



# Cartilage

- Look for avulsion fractures
- Misalignment
- Effusions

# Soft Tissue

1. Defect on normal contours
2. Obvious swelling
3. Foreign body (e.g. glass) in soft tissues
4. A fluid/solid interface
5. A gas/fluid interface

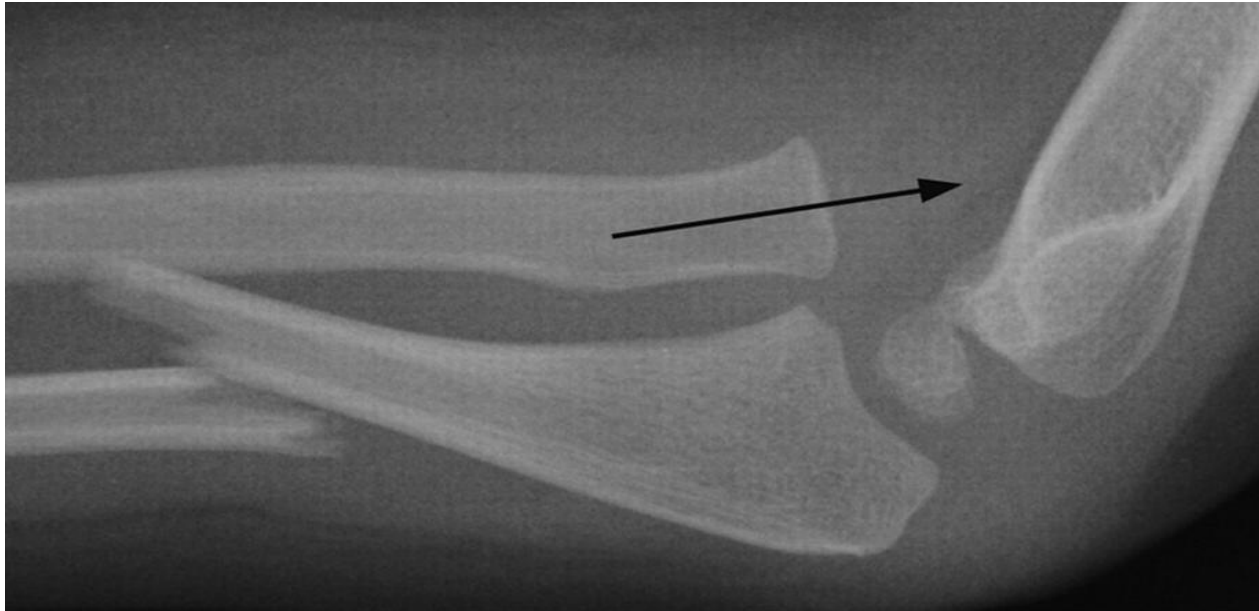
# Forearm – Galeazzi Fracture Dislocation

Fracture of the Radius

Dislocation of the  
distal Radio-ulna joint



# Forearm – Monteggia fracture-dislocation



- A displaced fracture to the proximal ulna
- With dislocation of the radial head



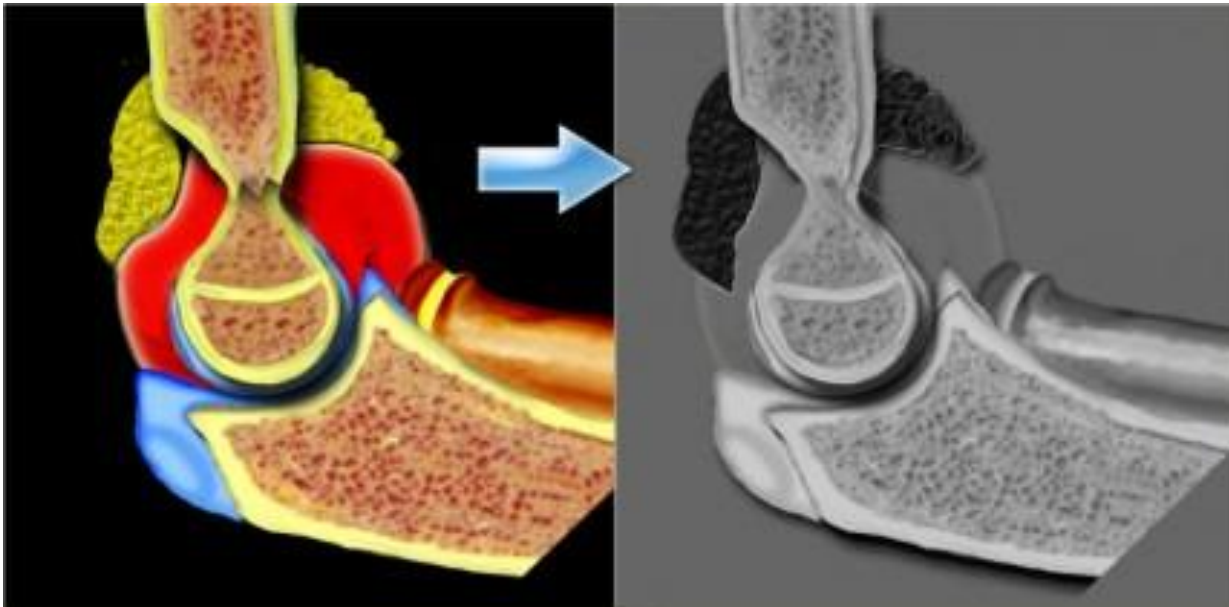
# Forearm – Nightstick Fracture

- Usually a defensive Injury
- Or direct blow to the Ulna



# Elbow – The Fat Pad Sign

Haemarthrosis results in an upward displacement of the anterior fat pad and a backward displacement the posterior fat.

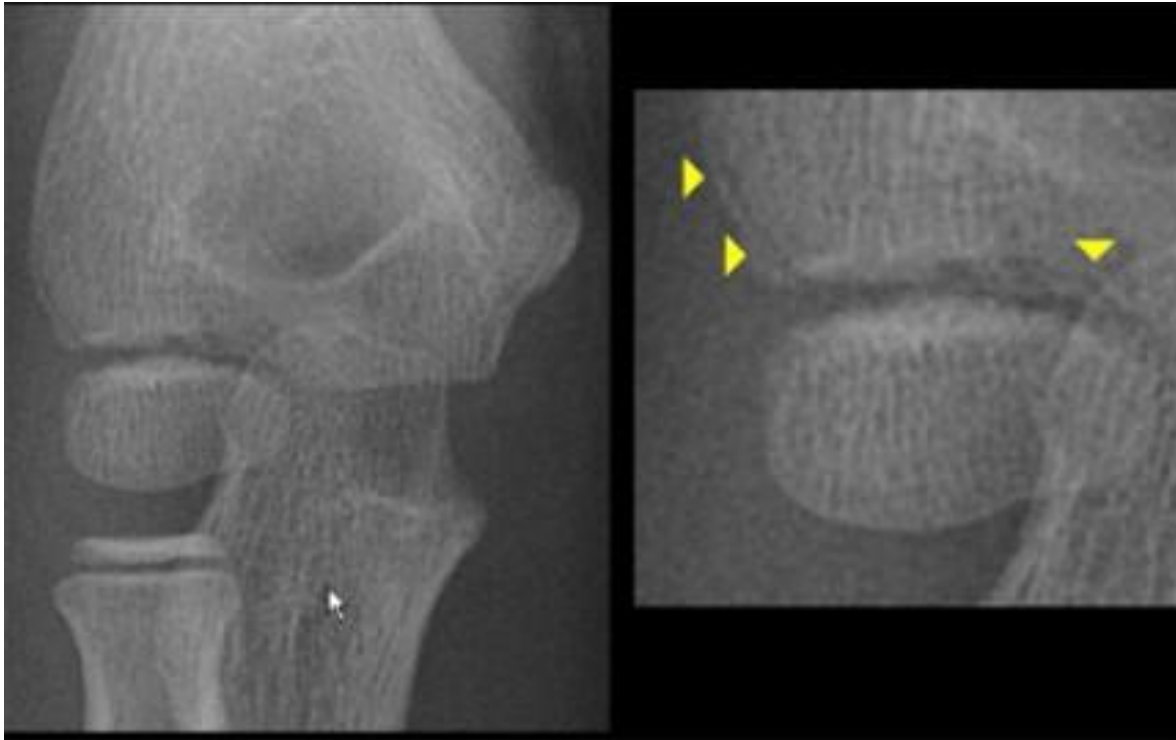
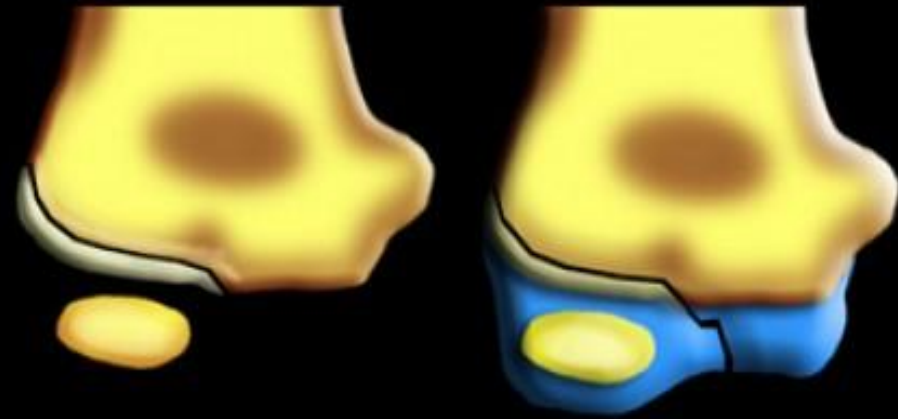


# Elbow Fractures in Children

## Common Elbow fractures

- Supracondylar >60%
- Lateral condyle 10-20%
- Medial epicondyle 10%
- Radial neck
- Olecranon

# Lateral Condyle Fractures



- Fracture lines are sometimes barely visible
- Lat. condyle fractures are the 2nd most common elbow-fracture in children

# Lateral Condyle Fractures



An oblique view can be useful.  
Note the radial head cleft

# Medial Epicondyle Avulsions

- 80% occur in boys with a peak age in early adolescence.
- The mechanism is a fall on the outstretched hand or sometimes due to arm wrestling.
- There is a 50% incidence of associated elbow dislocations.
- When the elbow is dislocated and the medial epicondyle is avulsed, can become trapped between the articular surface of the humerus and the olecranon



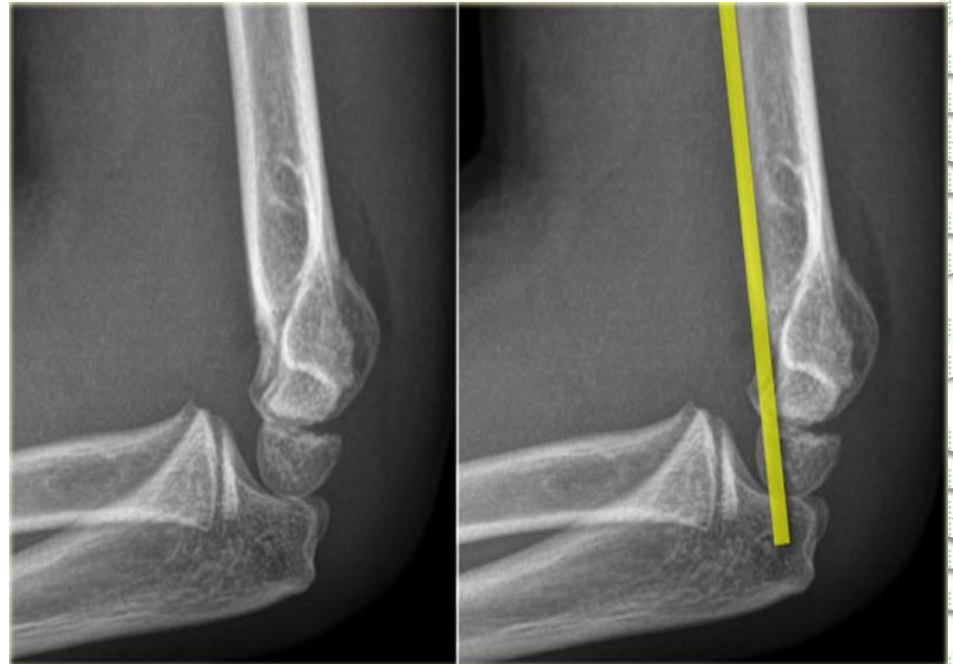
# Elbow – The Fat Pad Sign

- Sign of a significant joint effusion and likely fracture after trauma
- Not always present when the capsule has been compromised



# Elbow – Anterior Humeral Line

- Evaluate alignment of the elbow On the lateral projection draw a line along the anterior border of the distal humerus
- This line should intersect the middle third of the capitellum
- The distal humerus and capitellum has typical hockey stick configuration.





# Elbow – Radiocapitellar Line

Normal



Abnormal



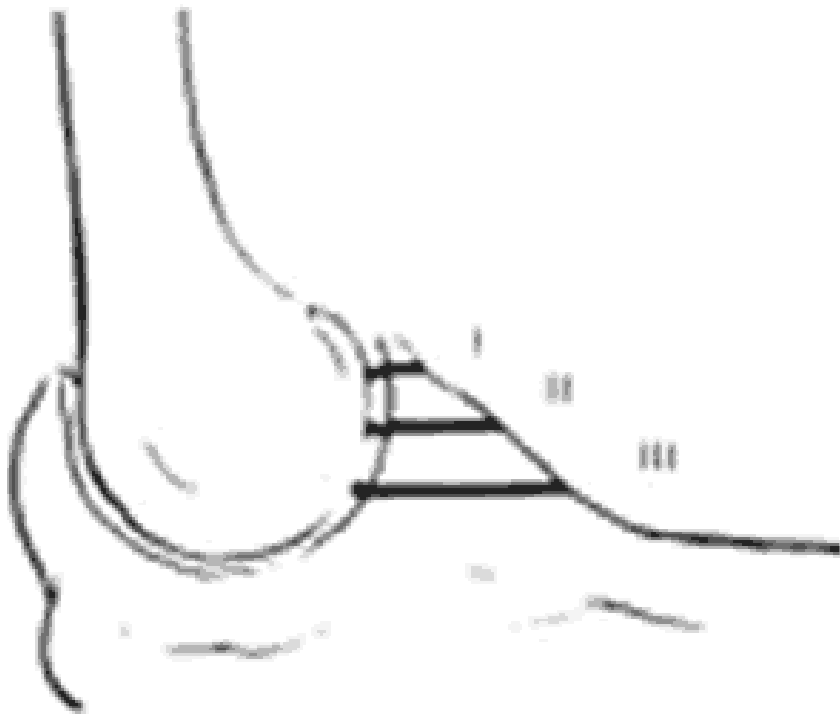
# Elbow – Radial Head



# Elbow – Olecranon Fracture



# Elbow – Coronoid Fracture



# Elbow – Capitellum Fracture



# Elbow - Supracondylar

- Typically seen in children.
- Occur as a result of a fall on a hyper-extended elbow
- may not be very obvious on x-ray
- may show elevation of the fat pad suggestive of intra-articular injury
- fracture line may be seen
- in a neonate or very young child it can mimic an elbow dislocation

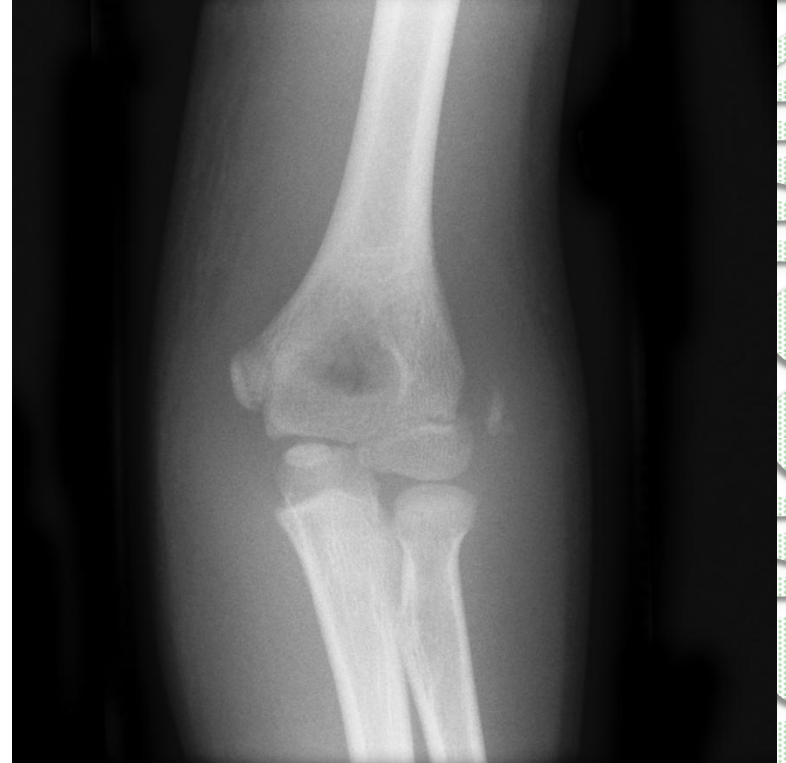


# Elbow – Medial Epicondyle Fracture



# Elbow – Avulsion

- Lateral Epicondyle Avulsion



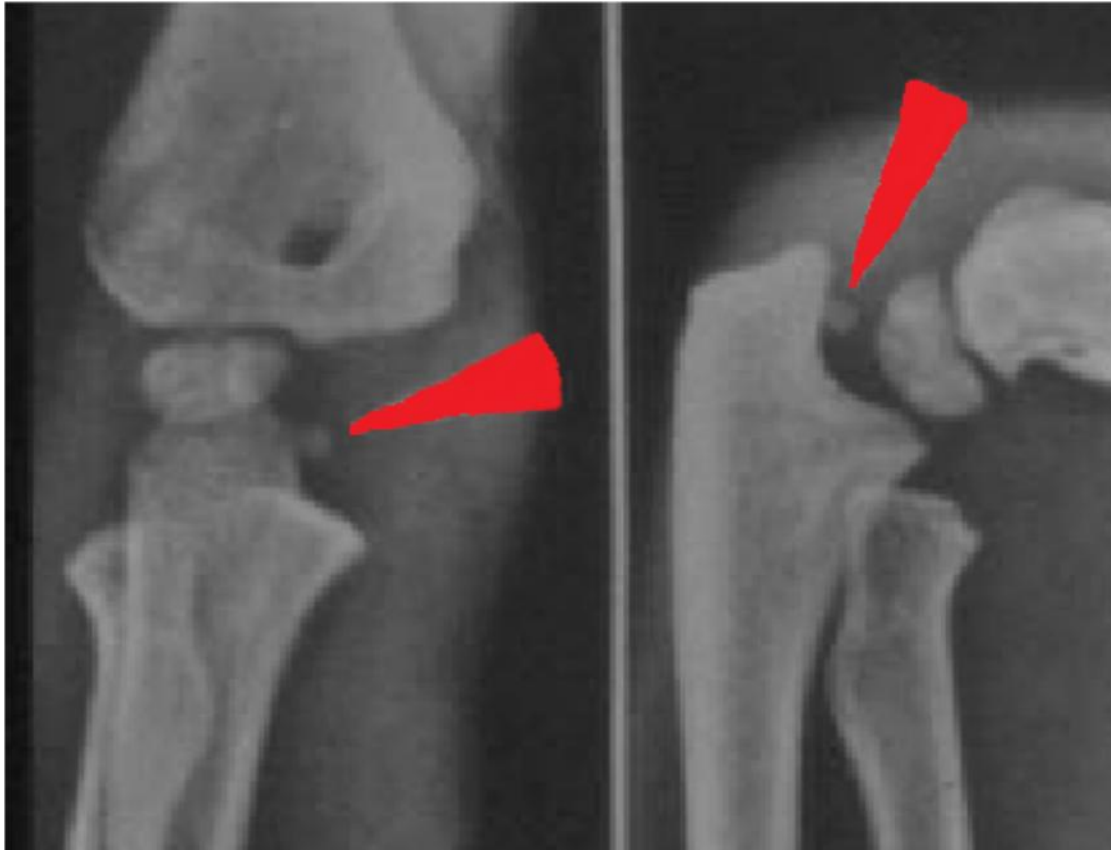


# Elbow

- It usually occurs in the second decade
- Frequently as a result of sports injuries.
- Common mechanism of injury is a fall on the wrist or hand with the elbow in extension.
- Posterior dislocation most common



# Elbow - Entrapment



# Elbow – Ulnar Collateral Ligament

- Heterotopic Calcification ulna side of the elbow as a result of repetitive injury
- Risk of rupturing ulna collateral ligament



# Pitfalls - Positioning

- Table too high
- Table too low
- Chubby Arms - (esp. young children)
- Wrist no pronation

Optimal Positions



# Inability to extend arm

- 2 AP Views – Centre as normal

**A** Radius & ulna flat  
on the plate



**B** Humerus  
flat on the plate

