

RADY 403 Case Presentation

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Focused patient history and workup

- 6 y.o. male presents with left elbow pain after fall
- Patient fell onto outstretched hand
- Reports 10/10 left elbow pain
- Also reports feeling numbness left hand
- No head trauma or loss of consciousness
- ROS otherwise unremarkable

List of imaging studies

- X-ray of left forearm
- X-ray of left humerus
- 2-view X-ray of left elbow

ACR Appropriateness Criteria

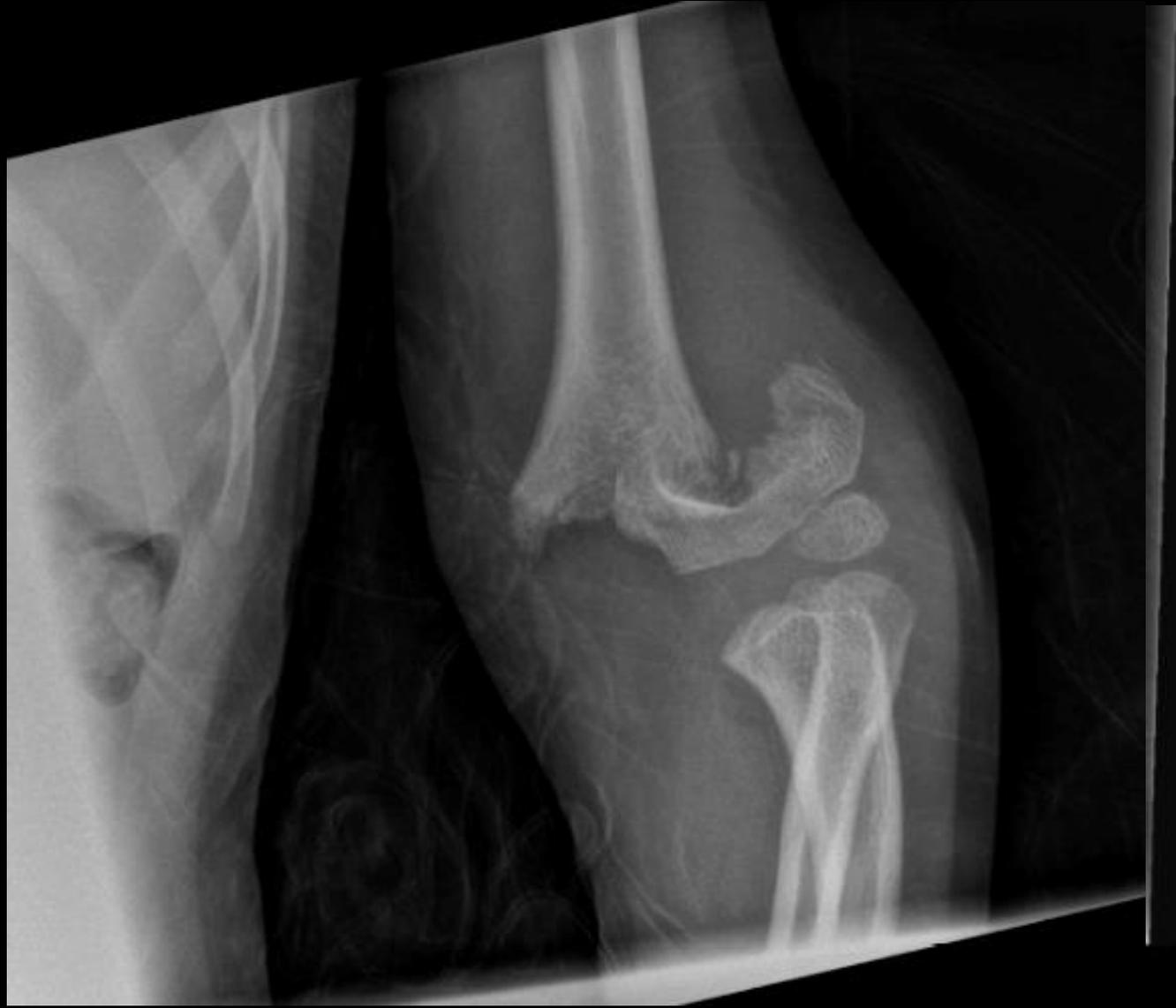
Variant 1:

Acute blunt or penetrating trauma to the hand or wrist. Initial imaging.

Procedure	Appropriateness Category	Relative Radiation Level
Radiography area of interest	Usually Appropriate	Varies
CT area of interest with IV contrast	Usually Not Appropriate	Varies
CT area of interest without and with IV contrast	Usually Not Appropriate	Varies
CT area of interest without IV contrast	Usually Not Appropriate	Varies
MRI area of interest without and with IV contrast	Usually Not Appropriate	○
MRI area of interest without IV contrast	Usually Not Appropriate	○
Bone scan area of interest	Usually Not Appropriate	☢☢☢
US area of interest	Usually Not Appropriate	○

Source: ACR.org







AP and lateral left humerus radiographs on day of injury



Laterally displaced acute fracture of distal humeral metaphysis. No other visible acute fracture. No bone destruction or erosion. The visualized joint spaces are normal.

AP and lateral left elbow radiographs on day of injury



Dorsolaterally displaced transverse acute fracture of the distal humeral metaphysis.

AP and lateral left forearm radiographs on day of injury



Displaced acute fracture of the distal humeral metaphysis. No acute fracture of the forearm.

Diagnosis

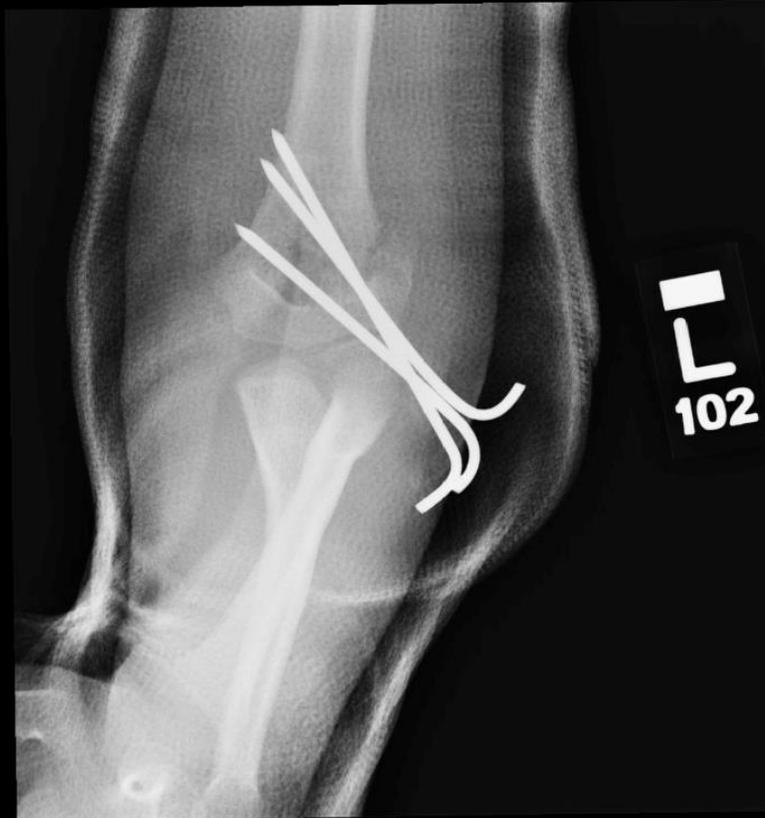
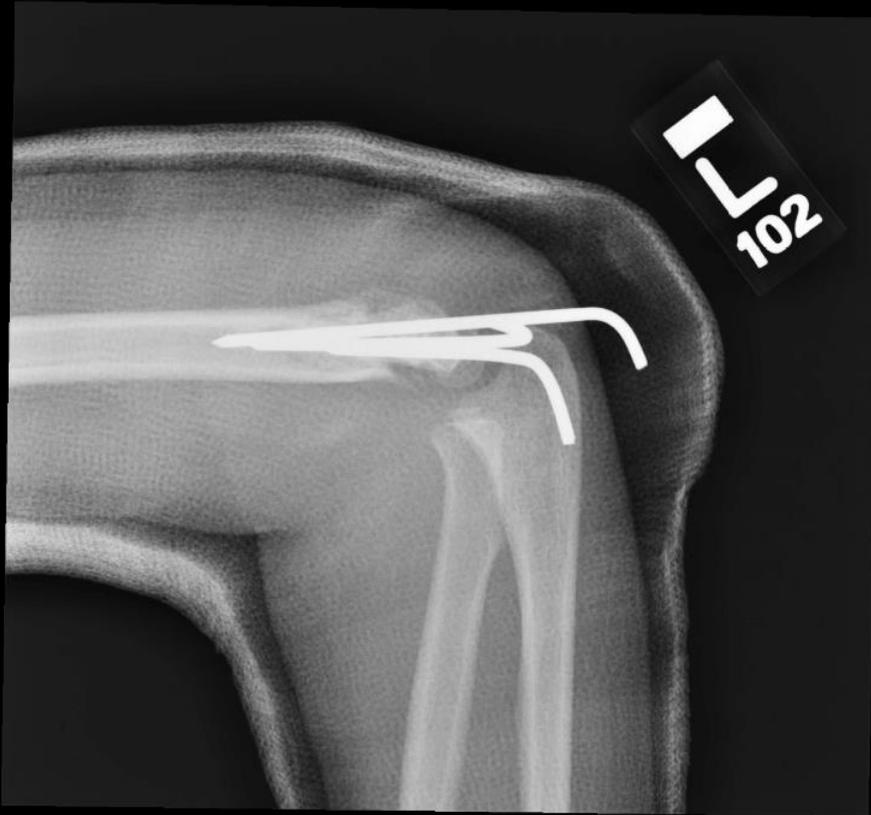
- Supracondylar humerus fracture (SHF)
- Defined as the fracture of the distal end of humerus just above the epicondyles

AP and lateral left forearm radiographs post-splint



Redemonstrated supracondylar fracture with persistent posterior and lateral displacement of the distal fracture fragment

Then->OR Lateral and AP L elbow radiographs post-fixation

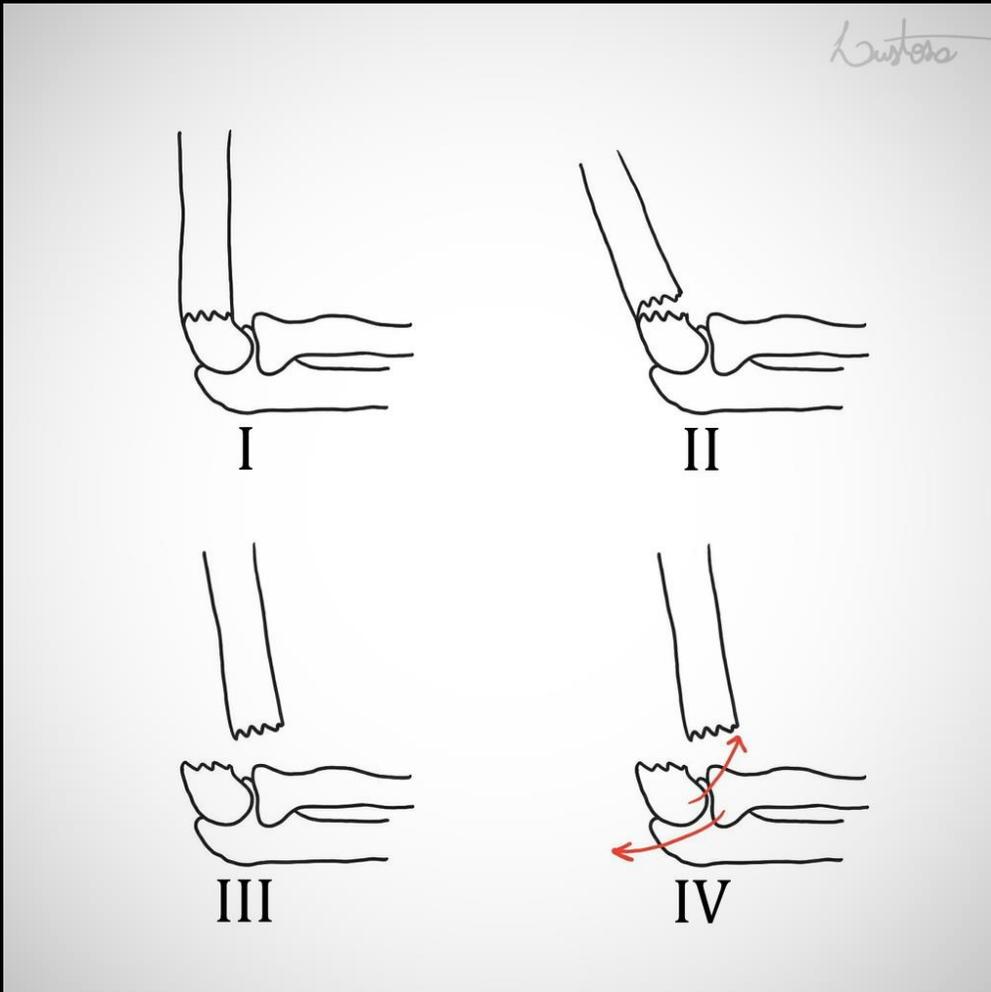


Interval K wire fixation of the comminuted supracondylar fracture with markedly improved alignment. Hardware appears intact. No new fractures identified.

Discussion

- Supracondylar humerus fractures (SHF) are the most common pediatric elbow fractures (50-70% of all pediatric elbow fractures)
- Mostly occur during first decade of life
- Almost always due to traumatic injury
- Most often due to fall on hyperextended elbow
- 2-view x-ray of elbow recommended
- X-rays of forearm also performed if there is suspicion of forearm injury. Forearm fractures occur in 5% of SHF cases

Gartland Classification



Type I: Nondisplaced or minimally displaced (<2 mm) fracture

Type II: Displaced (>2 mm) fracture with intact posterior cortex

Type III: Completely displaced fracture

Type IV: Displaced fracture with multidirectional instability due to an incompetent periosteal hinge, being unstable in both flexion and extension.

Indirect Signs of Fracture

- **Anterior** fat pad sign: Elevation of anterior fat pad creates "sail" sign
- **Posterior** fat pad sign: Presence of lucent crescent of fat in olecranon fossa on lateral elbow film
- The **anterior humeral line** drawn along the anterior humeral cortex should pass through the middle third of the capitellum. Failure to do so may indicate displacement.

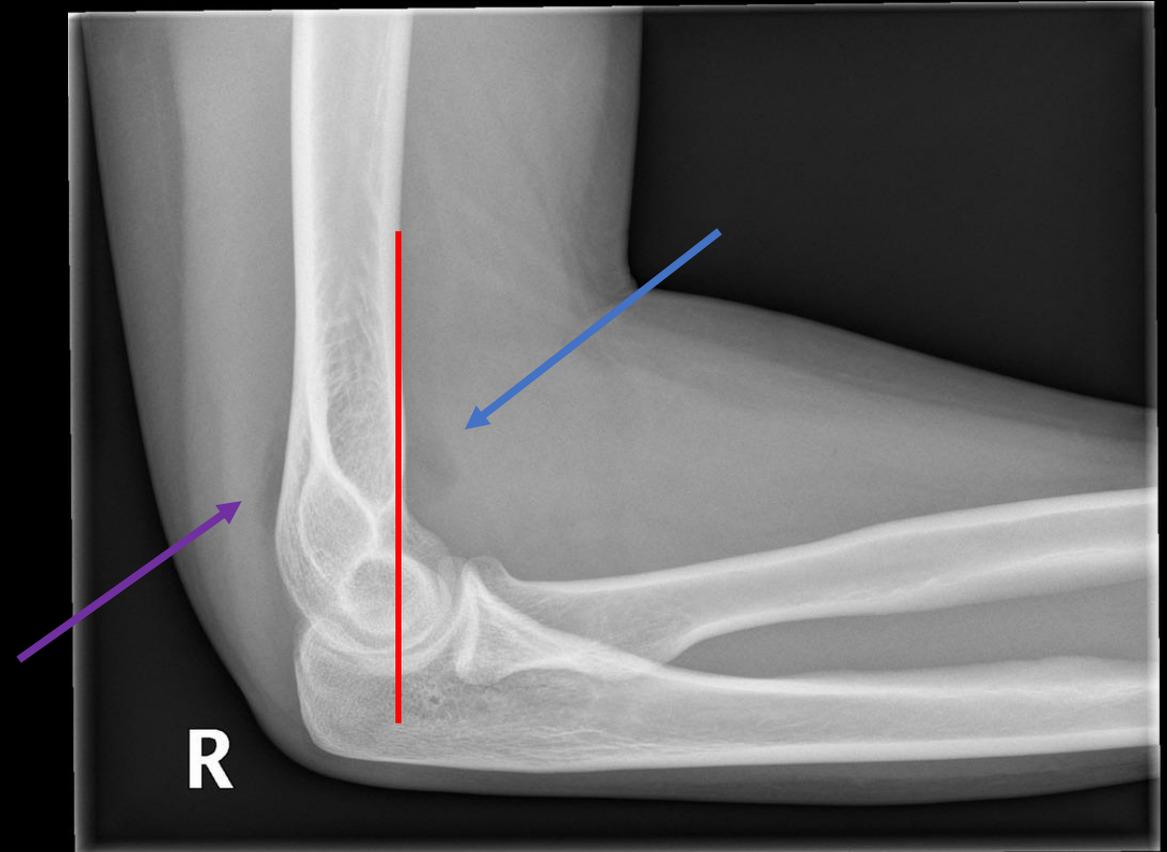


Image Source: radiopedia.org

Patient treatment or outcome

- Treatment is based on Gartland classification
- Type I: Treated non-surgically, elbow placed in cast at 60-90° of flexion for three weeks. Follow up radiographs in one week to confirm there is no displacement or malalignment
- Type II: Treated non-surgically in cases with no rotational deformity, coronal malalignment or significant extension of the distal fragment. Reduction and surgical fixation if these are present or are seen at one week follow up
- Type III/IV: Closed or open reduction followed by pin fixation
- Complications include malunion, neurological injury, and vascular injury

Wrap Up

- Supracondylar humerus fractures (SHF) are the most common pediatric elbow fractures (50-70% of all pediatric elbow fractures)
- Classified and treated based on degree of displacement
- Anterior and posterior fat pad signs can suggest fracture even if none are immediately apparent on plain films

References

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