RADY 403 Case Presentation

Christopher Jacob Reguyal
July 22, 2022
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.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>Relative Radiation Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiography area of interest</td>
<td>Usually Appropriate</td>
<td>Varies</td>
</tr>
<tr>
<td>CT area of interest with IV contrast</td>
<td>Usually Not Appropriate</td>
<td>Varies</td>
</tr>
<tr>
<td>CT area of interest without and with IV contrast</td>
<td>Usually Not Appropriate</td>
<td>Varies</td>
</tr>
<tr>
<td>CT area of interest without IV contrast</td>
<td>Usually Not Appropriate</td>
<td>Varies</td>
</tr>
<tr>
<td>MRI area of interest without and with IV contrast</td>
<td>Usually Not Appropriate</td>
<td>O</td>
</tr>
<tr>
<td>MRI area of interest without IV contrast</td>
<td>Usually Not Appropriate</td>
<td>O</td>
</tr>
<tr>
<td>Bone scan area of interest</td>
<td>Usually Not Appropriate</td>
<td>⚪️⬜️⬜️⬜️</td>
</tr>
<tr>
<td>US area of interest</td>
<td>Usually Not Appropriate</td>
<td>O</td>
</tr>
</tbody>
</table>

Source: ACR.org
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
Redemonstrated supracondylar fracture with persistent posterior and lateral displacement of the distal fracture fragment
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.

Image Source: radiopedia.org
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


