56-year-old male presents to the emergency room s/p fall on an outstretched hand (FOOSH)

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Patient Presentation

• HPI: 56 year-old male presents to the emergency room s/p fall on outstretched hand (FOOSH)
• There is pain and decreased range of motion in his left elbow and upper arm, with swelling at the olecranon
• Clinical differential diagnosis: humerus or olecranon fracture, triceps muscle or tendon tear, olecranon bursitis or hematoma
• Radiographs were obtained as the initial imaging study to rule out a fracture or dislocation
Pertinent Labs

• No Pertinent Labs
Left Elbow Radiographs- 2 Standard Projections

Lateral

Frontal
Findings of Left Elbow Radiographs

- Olecranon avulsion fracture:
  - Small fragment of bone (yellow arrow) has been displaced superiorly and posteriorly from the olecranon (asterisk)

- Adjacent subcutaneous edema causes soft tissue swelling (blue arrow)
What Imaging Should We Order Next?
Select the applicable ACR Appropriateness Criteria


<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>Relative Radiation Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>US elbow</td>
<td>Usually Appropriate</td>
<td>0</td>
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<tr>
<td>MRI elbow without IV contrast</td>
<td>Usually Appropriate</td>
<td>0</td>
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<tr>
<td>MR arthrography elbow</td>
<td>Usually Not Appropriate</td>
<td>0</td>
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<tr>
<td>MRI elbow without and with IV contrast</td>
<td>Usually Not Appropriate</td>
<td>0</td>
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<tr>
<td>CT arthrography elbow</td>
<td>Usually Not Appropriate</td>
<td>☠️</td>
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<tr>
<td>CT elbow with IV contrast</td>
<td>Usually Not Appropriate</td>
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<td>Usually Not Appropriate</td>
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<tr>
<td>3-phase bone scan elbow</td>
<td>Usually Not Appropriate</td>
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This imaging modality was ordered
Left Elbow MRI

H = humerus
T = trochlea
O = olecranon
U = ulna

T2-weighted, fat-suppressed
Sagittal

T2-weighted, fat-suppressed
Axial
• MRI is optimal to evaluate soft tissue injury

• Distal triceps tendon (yellow arrow) is torn from its olecranon (O) attachment and retracted, leaving a T2-bright tear gap filled with fluid/hemorrhage (green arrows)
Final Dx:

Distal Triceps Tendon Tear
Case Discussion

• Triceps tendon avulsions are a commonly missed tendinous injury and should always be considered in the differential diagnosis when there is post-traumatic pain and swelling at the dorsal elbow
  • Triceps tendon tears represent less than 1% of all tendon injuries in the upper extremity

• Rupture most often occurs where the tendon inserts onto the olecranon
• First-line imaging study: radiographs of the elbow
  • imaging should be used in conjunction with clinical examination

• MRI is key to evaluate a suspected soft tissue injury
  • confirmed the cause of the olecranon avulsion fragment: distal triceps tendon tear
  • this patient underwent a distal triceps tendon repair because of the functional deficit (loss of elbow extension) caused by the full-thickness, retracted tendc
References:

