AMSER Case of the Month June 2025
65 y/o F with worsening left wrist pain

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Patient Presentation

- HPI: Patient is a 65-year-old female with past medical history significant for HTN, breast cancer, T2DM, anxiety, and hyperlipidemia who presented to the office with worsening left wrist pain persisting for a couple of months.

- Pain is described as worst at the wrist, both laterally and medially, radiating proximally to the arm, and distally into the hand and is exacerbated by hand gripping, ulnar deviation and general wrist movement.

- Pain is refractory to conservative measures (bracing, exercises, NSAIDs) as well as intra-articular steroid injections.

History/Objective Findings

- Medications: Rosuvastatin 20mg, Meloxicam 15mg, Lisinopril 5mg, Sertraline 100mg, Metformin 500mg, Insulin lispro, Omeprazole 40mg
- Allergies: Sulfamethoxazole-Trimethoprim, Sitagliptin-Phosphate
- Social Hx: Former smoker (10-pack year), no history of alcohol use or IVDU
- Physical Exam: Tenderness over the left wrist, distal radius, and ulna. Pain with ulnar deviation and wrist extension, (+) Finkelstein's Test

Pre-Imaging Differential Diagnosis

- Extensor Carpi Ulnaris Tendonitis
- De Quervain's Tenosynovitis
- Scaphoid fracture/ Scaphoid AVN
- Kienböck Disease
- Ulnar impaction syndrome

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

Variant 1: **Adult. Chronic hand or wrist pain. Initial imaging.**

Procedure	Appropriateness Category	Relative Radiation Level
Radiography area of interest	Usually Appropriate	Varies
US area of interest	May Be Appropriate	O
Radiographic arthrography area of interest	Usually Not Appropriate	Varies
MR arthrography area of interest	Usually Not Appropriate	O
MRI area of interest without and with IV contrast	Usually Not Appropriate	O
MRI area of interest without IV contrast	Usually Not Appropriate	O
Bone scan area of interest	Usually Not Appropriate	☢☢☢
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
CT arthrography area of interest	Usually Not Appropriate	Varies

This imaging modality was ordered by the physician

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Findings (unlabeled)

PA View

Oblique View

Findings: (labeled)

Increased radiodensity of the lunate representing sclerotic changes and potential osteonecrosis

Abnormally shortened ulna compared to radius measuring 3.0mm (negative ulnar variance)

Thin radiolucent line through the lunate suggesting potential fracture

What Imaging Should We Order Next?

Select the applicable ACR Appropriateness Criteria

Variant 2: **Clinically suspected osteonecrosis. Normal radiographs or radiographs that show findings suspicious for osteonecrosis. Next imaging study.**

Procedure	Appropriateness Category	Relative Radiation Level
MRI area of interest without IV contrast	Usually Appropriate	O
MRI area of interest without and with IV contrast	May Be Appropriate	O
CT area of interest without IV contrast	May Be Appropriate (Disagreement)	Varies
Bone scan area of interest	Usually Not Appropriate	☢☢☢
CT area of interest with IV contrast	Usually Not Appropriate	Varies
CT area of interest without and with IV contrast	Usually Not Appropriate	Varies

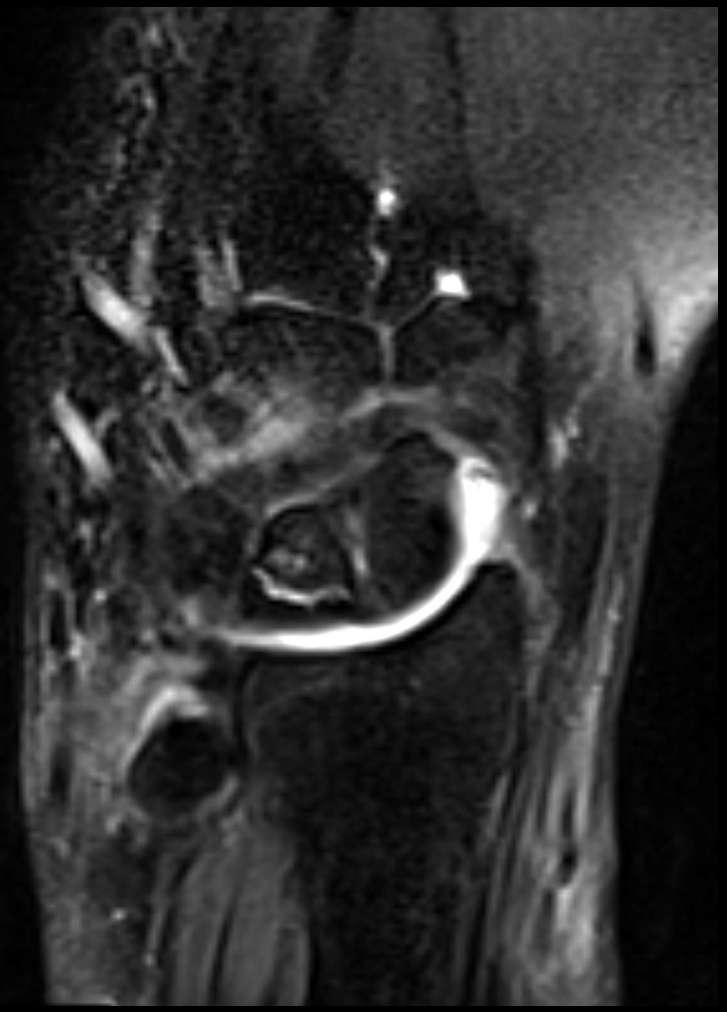
This imaging modality was ordered by the physician

Findings (unlabeled)

T2-weighted

T1-weighted

Additional Findings (unlabeled)



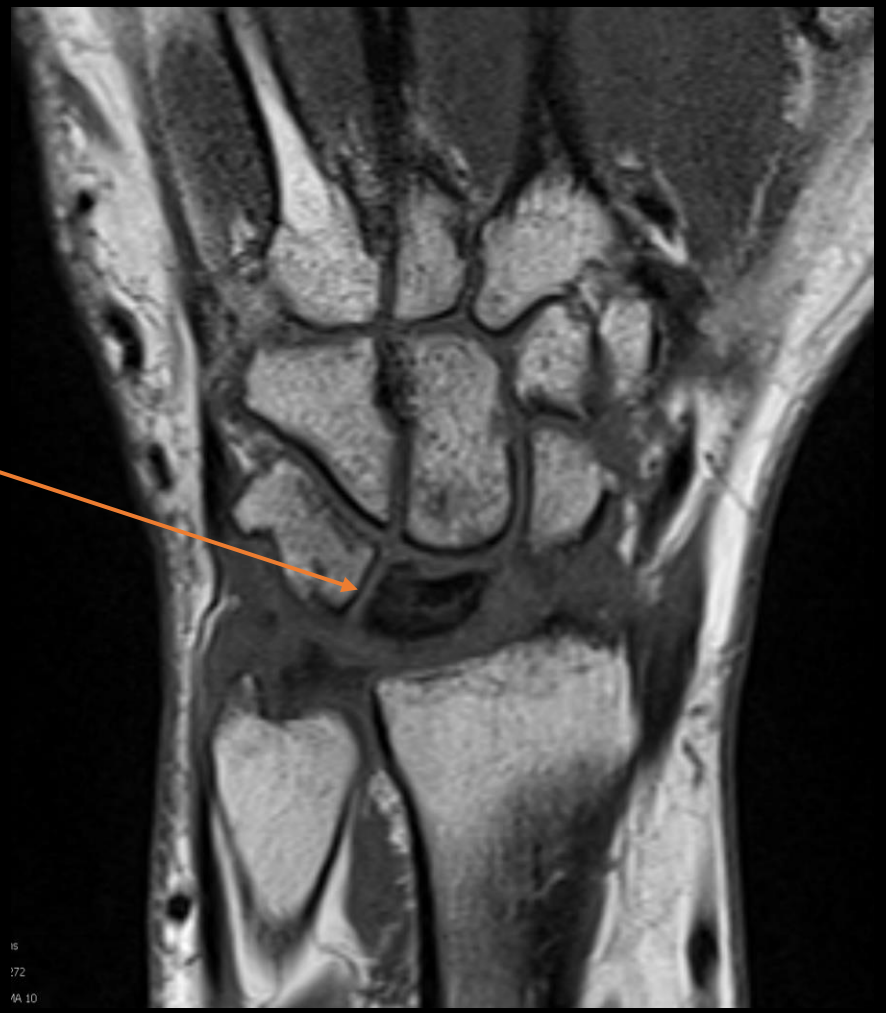
T2-weighted

T1-weighted

Findings: (labeled)

T1 diffusely hypointense lesion suggesting avascular necrosis of the lunate

T2 hyperintense line suggesting a lunate fracture



Additional Findings: (labeled)

T1 diffusely hypointense lesion suggesting: Avascular Necrosis of the Lunate

T2 hyperintense line suggesting: Lunate Fracture

Final Dx:

Kienböck Disease

Avascular necrosis of the lunate

Case Discussion

Definition:

- Kienböck disease is described as avascular necrosis of the lunate bone and is sometimes referred to as lunatomalacia.

Etiology/Epidemiology:

- Second most common cause of osteonecrosis of the carpal bones (following avascular necrosis of the scaphoid)
  - Affects about 200,000 people in the US today
- Most commonly occurs in young or middle-aged adult men; ages 20-40
- Usually occurs in the dominant hand
- There is an increased association with laborers, athletes, and cerebral palsy.

Case Discussion

Classic Clinical Presentation:

- Progressive unilateral wrist pain commonly over the dorsum of the wrist often in the absence of trauma
- Decreased wrist mobility
- Decreased grip strength
- Tenderness on palpation of carpal bones

Classic Radiological Findings:

- Negative Ulnar Variance: The ulna appears shortened relative to the radius usually measuring > 2.5mm proximally from the distal aspect of radius
- Lunate sclerosis and fragmentation on plain radiograph
- Diffuse T1 hypointense signal in the lunate

Case Discussion

Pathophysiology:

- Repetitive use or microtrauma can cause disruption of the vasculature supplying the lunate leading to bone infarction and necrosis. As a result, there is an increased potential of lunate fracture or fragmentation.

Treatment and prognosis:

- Treatment is usually conservative
- Potential options range depending on the severity of the disease. Initial measures include wrist splinting and immobilization, followed by potential “bone-leveling” surgery through radial shortening osteotomy and vascular grafting for more severe cases.
- Prognosis: without surgical management, patients tend to have continued pain and worsening of symptoms.

Case Discussion

Key Differential Diagnosis: Ulnar Impaction Syndrome

- Also commonly presents in middle-aged adults with ulnar-sided wrist pain and weakness that is worsened with activity. On imaging, carpal bone sclerosis is common.

- Key radiological difference:

  - **Positive Ulnar Variance:** The ulna appears lengthened relative to the radius usually measuring > 2.5mm distal to the distal aspect of the radius
  - As opposed to negative ulnar variance seen in Kienböck Disease.

References

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