

AMSER Case of the Month

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36 year old male with unilateral wrist pain

Ha Yeon Lee, MS-III

Loma Linda University School of Medicine

Dr. Taylor Charter, DO, R2

Loma Linda University Health, Department of Radiology

Dr. Amanda Aguilera, MD

Loma Linda University Health, Department of Radiology



LOMA LINDA UNIVERSITY
School of Medicine



Patient Presentation

- **HPI:** 36 y/o male presenting with right wrist pain after a fall 4 mo ago. Pt has been wearing a wrist brace for stabilization and states that the pain is getting better
- **PMHx:** Asthma, hypertension
- **PSHx:** Left hand extensor tendon repair post laceration
- **Medications:** Albuterol, lisinopril
- **Social Hx:** Smoker

Objective Findings

- **Labs:** None
- **Vitals:** BP: 152/94 mmHg, Pulse: 84, SpO2%: 98%, Respirations: 18
- **Physical Exam:**
 - TTP over R scaphoid with mild swelling
 - Painful ROM with no dislocation, atrophy, or open wounds
 - Mildly limited extension, otherwise full ROM
 - Able to make a fist

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	0
Radiographic arthrography area of interest	Usually Not Appropriate	Varies
MR arthrography area of interest	Usually Not Appropriate	0
MRI area of interest without and with IV contrast	Usually Not Appropriate	0
MRI area of interest without IV contrast	Usually Not Appropriate	0
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.

Findings (unlabeled)



Findings: (labeled)

- Minimally displaced fracture of mid scaphoid
- Sclerotic changes of scaphoid proximal pole



Final Dx:

Scaphoid avascular necrosis

Case Discussion

- **Background:**
 - Fall onto an outstretched hand (FOOSH) is a common mechanism of injury to the wrist, often involving the scaphoid bone
 - Injury to the scaphoid is categorized by location (distal pole, central third, proximal pole)
 - Proximal pole fractures make up ~15% of injuries. Avascular necrosis (AVN) and nonunion are known complications due to the unique retrograde blood supply of the dorsal carpal branch of the radial artery
 - Vascular disruption leads to ischemia and death of the bone

Case Discussion

- Symptoms and Exam Findings:
 - Pain localized to the radial aspect of the wrist
 - Swelling may or may not be noticeable
 - ROM only slightly reduced with weightbearing or motion-induced pain
 - Typically, grip strength reduced
 - Focal tenderness present on volar prominence, anatomic snuff box, and/or distal to Lister's Tubercle

Case Discussion

- Patient findings
 - After 4 months of initial injury, the patient reported feeling better with conservative management, including brace support
 - The normal course of healing on X-ray should show bridging callus, reduced fracture gap, fading fracture lines, and overall remodeling signs
 - However, the patient's radiograph showed sclerotic changes pointing towards developing avascular necrosis
 - Osteonecrosis has a significant risk of progression as it is often asymptomatic in early stages and sometimes seems to "feel better" like this patient

Case Discussion

- **Management:**
 - Initial management is conservative treatment. But due to vascular anatomy there is a risk of progression to AVN
 - After X-ray, MRI is the most sensitive and specific imaging method to detect early AVN
 - Treatment must be tailored based on factors:
 - Stage of AVN
 - Presence of fracture
 - Patient age and activity level
 - If AVN is present, surgical interventions are recommended, either with screw fixation or with bone grafting

References:

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