

# AMSER Case of the Month: June 2019

48 yo M with pain over L wrist s/p MVC

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# Patient Presentation

- HPI: 48 yo M unrestrained intoxicated driver presents s/p motor vehicle crash with chief complaint of left wrist pain. History was difficult to obtain due to intoxication
- PMHx: HTN
- PSx: None
- Social: Drinks alcohol
- Physical Exam: There is obvious deformity of the left wrist with tenderness throughout. Range of motion is limited secondary to pain. Rest of exam deferred due to intoxication.
- V/S: Within normal limits

What Imaging Should We Order?

# Select the applicable 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  | ○                        |
| Tc-99m bone scan area of interest                 | Usually Not Appropriate  | ☢☢☢                      |
| US area of interest                               | Usually Not Appropriate  | ○                        |

This imaging modality was ordered by the ER physician



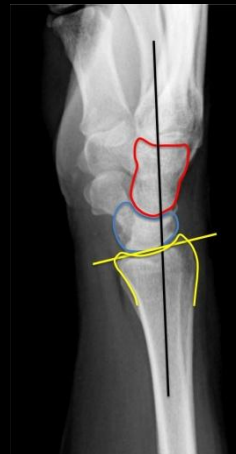
# Findings



# Findings

## Perilunate Dislocation

Proximal portion of capitate should align with the distal "cup" of the lunate

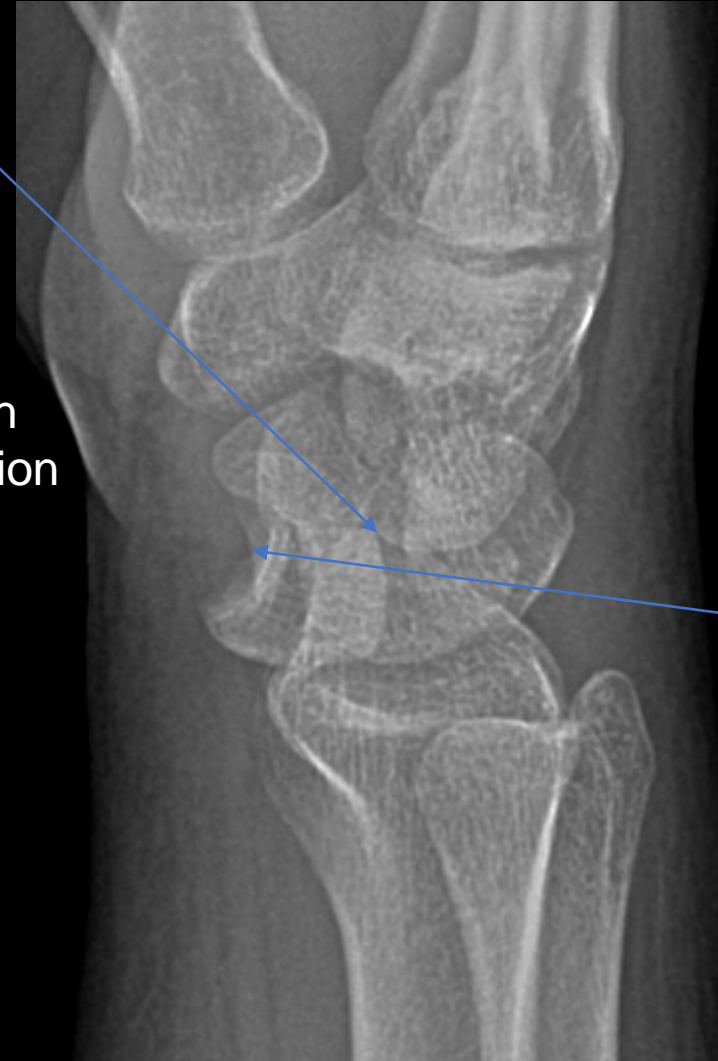


Lunate remains articulated with distal radius

# Findings: Post Reduction



Successful reduction of  
perilunate dislocation with  
subsequent lunate dislocation



“Empty cup”  
sign with the  
lunate rotated  
volarly

Final Dx:

Perilunate dislocation with  
subsequent lunate dislocation



# Select the applicable ACR Appropriateness Criteria

**Variant 4:**

**Initial radiographs showing distal radioulnar joint or carpal malalignment in the absence of fracture. Next imaging study.**

| Procedure                                       | Appropriateness Category | Relative Radiation Level |
|---|--------------------------|--------------------------|
| CT wrist without IV contrast bilateral          | Usually Appropriate      | ☢                        |
| MRI wrist without IV contrast                   | Usually Appropriate      | ○                        |
| MR arthrography wrist                           | Usually Appropriate      | ○                        |
| CT arthrography wrist                           | May Be Appropriate       | ☢                        |
| CT wrist without and with IV contrast bilateral | Usually Not Appropriate  | ☢                        |
| CT wrist with IV contrast bilateral             | Usually Not Appropriate  | ☢                        |
| MRI wrist without and with IV contrast          | Usually Not Appropriate  | ○                        |
| Tc-99m bone scan wrist                          | Usually Not Appropriate  | ☢☢☢                      |
| US wrist  | Usually Not Appropriate  | ○                        |

This imaging modality was ordered by the Orthopaedic Resident

# Findings

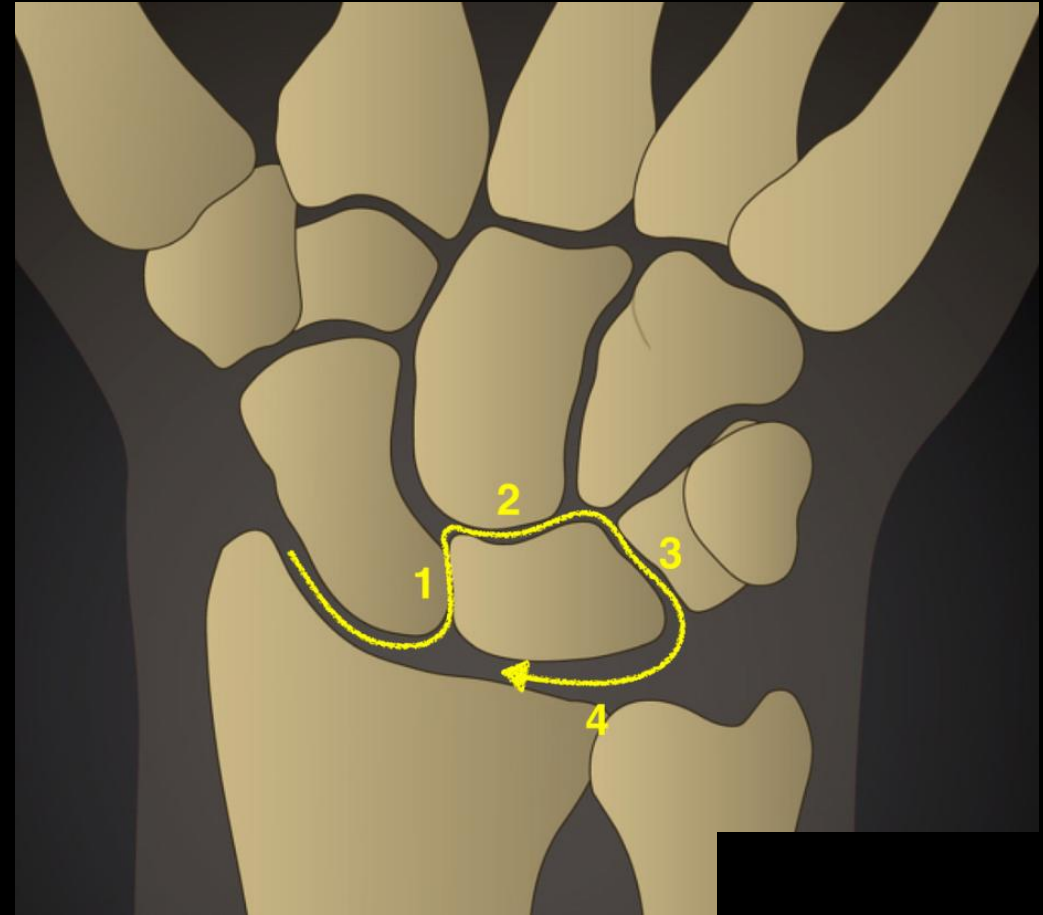


Bone avulsion at lunotriquetral ligament attachment

Scapholunate widening indicating scapholunate ligament disruption

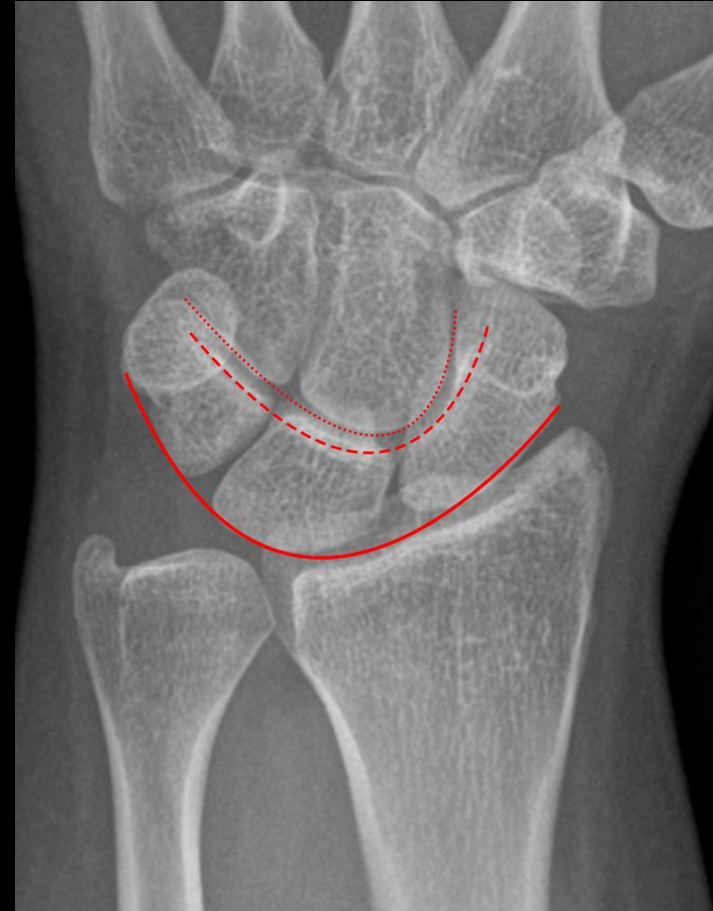
# Lunate Dislocation with Perilunate Dissociation

- Mechanism of Injury: Typically occurs in high energy trauma with the wrist extended and ulnar deviation
- Classic presentation – Wrist swelling + pain +/- median nerve symptoms
- Classified/Staged by Mayfield Classification
  - Stage I – Scapholunate dissociation
  - Stage II – SL dissociation with capitolunate disruption
  - Stage III – SL + LC with lunotriquetral disruption
  - Stage IV – Lunate displaced from lunate fossa
    - Typically presents with median nerve symptoms



# Gilula's Carpal Arcs

- Radiological lines that allow quick identification of normal alignment of the carpal bone
- 3 total lines
  - First – Proximal convex curve outlining the scaphoid, lunate, and triquetrum
  - Second – Distal concave curve outlining scaphoid, lunate, and triquetrum
  - Third – Proximal curve outlining the capitate and hamate



# Treatment Options

- Closed reduction
  - Hang the arm by the fingers with the elbow flexed at 90 degrees for 10-15 mins
    - Volar - Flex wrist with volar pressure applied to lunate in attempt to relocate
    - Dorsal – Wrist extension followed by traction and then wrist flexion
  - Sugar tong splint
- Surgical options
  - Open reduction internal fixation with K-wires
    - Multiple approaches depending on surgeon preference.
    - Typically involves ligament repair along with carpal tunnel release due to likelihood of developing carpal tunnel symptoms
  - Proximal row carpectomy

Final reduction



# References

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- Muppavarapu, Raghuveer C, and John T Capo. “Perilunate Dislocations and Fracture Dislocations.” *Hand Clinics.*, vol. 31, no. 3, pp. 399–408.
- Budoff, Jeffrey E. “Treatment of Acute Lunate and Perilunate Dislocations.” *The Journal of Hand Surgery.*, vol. 33, no. 8, 2008, pp. 1424–1432.
- Gilula LA. Carpal injuries: analytic approach and case exercises. *AJR Am J Roentgenol.* 1979;133(3): 503-17. [doi:10.2214/ajr.133.3.503](https://doi.org/10.2214/ajr.133.3.503)
- Hacking C, et al. “Mayfield classification of carpal instability (perilunate instability).” <https://radiopaedia.org/articles/mayfield-classification-of-carpal-instability-perilunate-instability-1?lang=us>.