AMSER Case of the Month: October 2018

36-year-old female presents with right wrist deformity

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Patient Presentation

- HPI: 36-year-old female presents with right wrist deformity. Patient reports she tripped and fell over a curb onto her right arm. She reports swelling and pain at the distal aspect of her right forearm but denies numbness or tingling.
- PMH: hyperlipidemia, hypothyroidism
- PSH: none
- Meds: none
- Physical exam: vitals normal. MSK exam with closed deformity of the distal right forearm.

What Imaging Should We Order?

ACR Appropriateness Criteria for acute hand and wrist trauma

Radiologic Procedure	Rating	Comments	RRL*
X-ray wrist	9		☢
CT wrist without IV contrast	1		☢
CT wrist with IV contrast	1		☢
CT wrist without and with IV contrast	1		☢
MRI wrist without IV contrast	1		O
MRI wrist without and with IV contrast	1		O
Tc-99m bone scan wrist	1		☢☢☢
US wrist	1		O
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			*Relative Radiation Level

This imaging modality was ordered.

Radiographic findings (unlabeled)

Our patient:

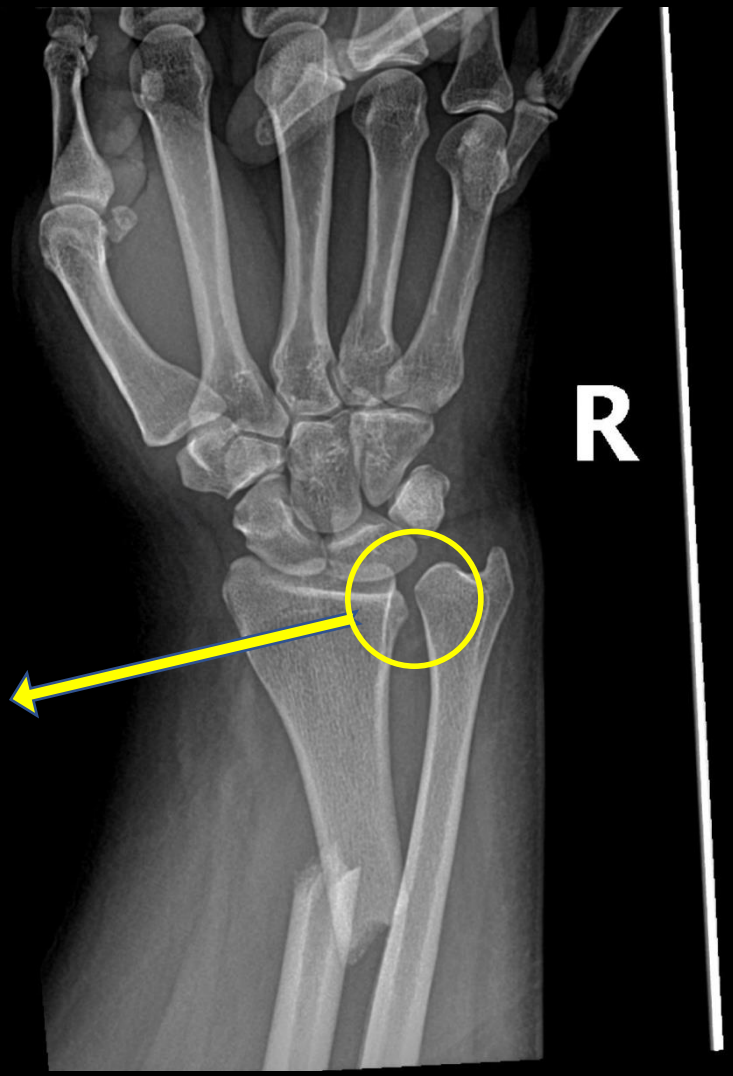
Normal radiograph, for comparison:

Radiographic findings (unlabeled)

Our patient:

Normal radiograph, for comparison:

Radiographic findings (labeled)



Radioulnar joint dislocation

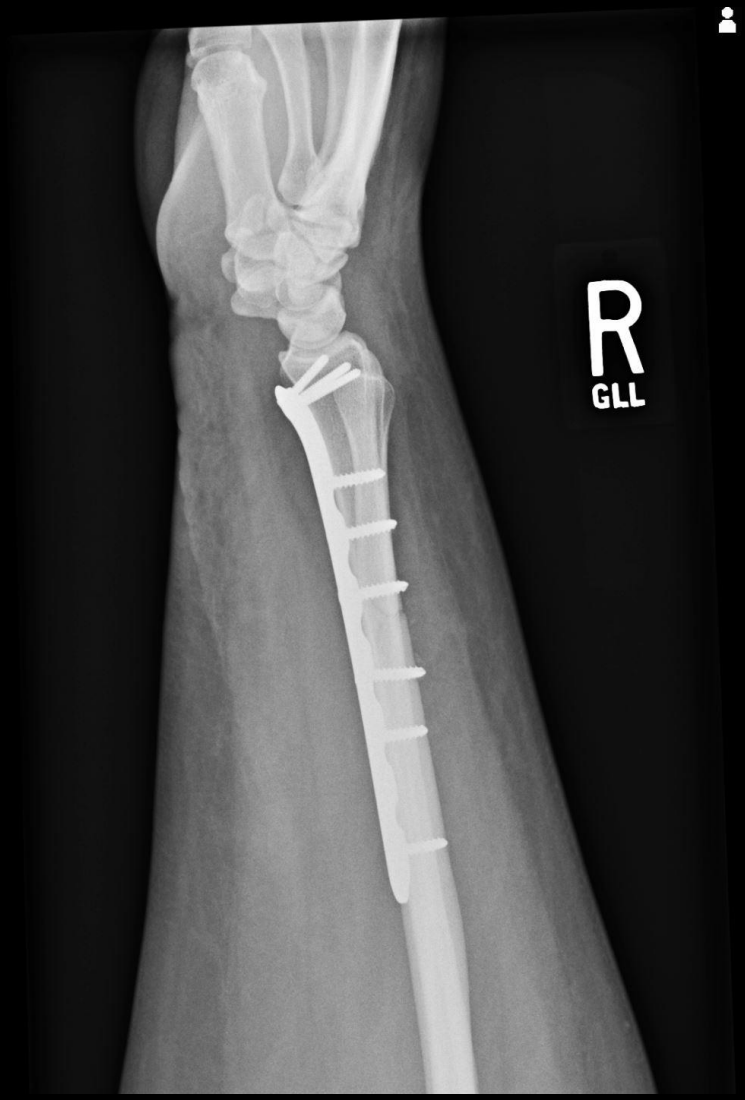
Distal radius fracture

Final Dx:

Galeazzi fracture (distal radial fracture with distal radio-ulnar dislocation)

The patient's forearm was splinted in the ED, and she later underwent surgical fixation (ORIF, or open reduction with internal fixation).

Radiographs s/p ORIF



Galeazzi fracture

- Epidemiology: accounts for approximately 7% of all forearm fractures. Risk factors include sports, osteoporosis, and being post-menopausal. This results in a bimodal distribution of incidence, with young males and elderly females being most susceptible.
- Mechanism: usually due to fall onto outstretched hand with extended wrist and hyperpronated forearm.
- Presentation: as with most fractures, presents with pain and localized swelling. Although rare, damage to ulnar or radial nerves can present with numbness, tingling, or weakness in the hand.

Galeazzi fracture

- Evaluation: for suspected acute wrist fracture, preferred first exam is AP and lateral wrist x-ray. Findings consistent with Galeazzi fracture include fracture of the distal radius with signs of distal radio-ulnar joint dislocation (widening of DRUJ, dorsal displacement of ulna on lateral view, radial shortening >5mm, and ulnar styloid fracture).
  - If radiographs show evidence of comminuted, intra-articular fracture, CT wrist without IV contrast is the preferred next exam (see next slide).
  - If vascular compromise is suspected, further evaluation is typically performed with MRA, CTA, or color doppler sonography.

ACR Appropriateness Criteria for acute hand and wrist trauma, Variant 3

Clinical Condition: **Acute Hand and Wrist Trauma**

Variant 3: **Comminuted, intra-articular distal radius fracture on radiographs. Surgical planning.**

Radiologic Procedure	Rating	Comments	RRL*
CT wrist without IV contrast	9	This procedure is especially useful if 3-D reconstruction is available.	☢
MRI wrist without IV contrast	5	This procedure may be helpful to diagnose for ligament or soft-tissue injuries.	O
CT wrist with IV contrast	1		☢
CT wrist without and with IV contrast	1		☢
MRI wrist without and with IV contrast	1		O
Tc-99m bone scan wrist	1		☢☢☢
US wrist	1		O

Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate

*Relative Radiation Level

Galeazzi fracture

- Treatment:
  - In adults, surgical repair with ORIF is preferred, as they tend to have poor outcomes with closed reduction.
  - In children, closed reduction is preferred, as their bones are immature and heal well.

References

- American College of Radiology. ACR Appropriateness Criteria®. Available at https://acsearch.acr.org/list. Accessed 9 September 2018.
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- Hotchkiss R, Marks T. Management of acute and chronic vascular conditions of the hand. *Current Reviews in Musculoskeletal Medicine*. 2014;7(1):47-52. doi:10.1007/s12178-014-9202-6.
- Sebastin SJ, Chung KC. A Historical Report on Riccardo Galeazzi and the Management of Galeazzi Fractures. *The Journal of hand surgery*. 2010;35(11):1870-1877. doi:10.1016/j.jhsa.2010.08.032.
- Normal wrist radiographs courtesy of Dr. Andrew Dixon, https://radiopaedia.org/cases/normal-wrist-x-rays