

AMSER Case of the Month: March 2018

61 year old male with acute left arm pain



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Patient Presentation

- CC/HPI: 61 year old male presents to ED with acute, severe left arm pain: stating he “simply twisted his arm and heard a crack with immediate pain.”
- Past Medical History: multiple myeloma (MM), thyroid disease
- Past Surgical History: partial thyroidectomy, total hip arthroplasty
- Vitals: BP 133/88, SPO2 99%, Temp 97.7 F(36.5 C), HR 65, Height 6’ 1”, Weight 93kg, BMI 27.1, Pain score 8

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

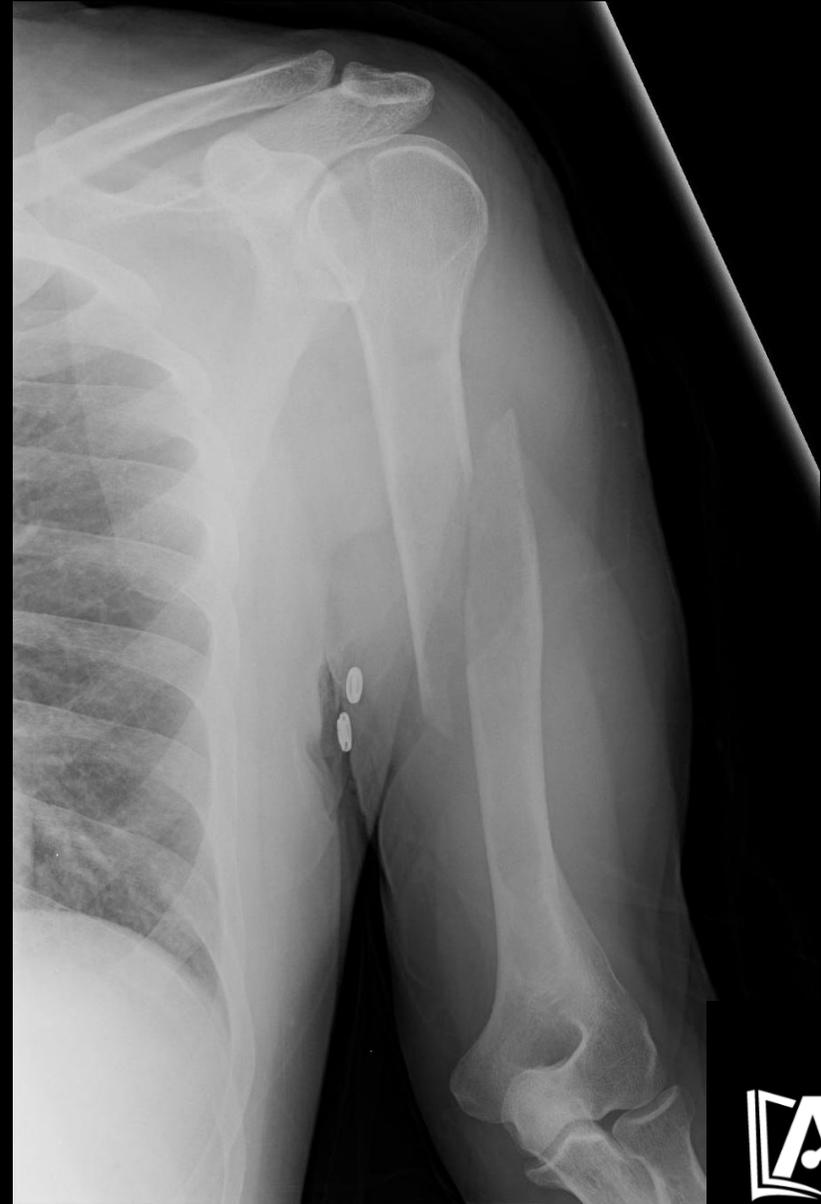
Variant 1: Traumatic shoulder pain. Any etiology. Initial imaging.

Procedure	Appropriateness Category	Relative Radiation Level
X-ray shoulder	Usually Appropriate	⊕
CT arthrography shoulder	Usually Not Appropriate	⊕ ⊕ ⊕ ⊕
CT shoulder with IV contrast	Usually Not Appropriate	⊕ ⊕ ⊕
CT shoulder without and with IV contrast	Usually Not Appropriate	⊕ ⊕ ⊕
CT shoulder without IV contrast	Usually Not Appropriate	⊕ ⊕ ⊕
FDG-PET/CT skull base to mid-thigh	Usually Not Appropriate	⊕ ⊕ ⊕ ⊕
MR arthrography shoulder	Usually Not Appropriate	○
MRI shoulder without and with IV contrast	Usually Not Appropriate	○
MRI shoulder without IV contrast	Usually Not Appropriate	○
Tc-99m bone scan shoulder	Usually Not Appropriate	⊕ ⊕ ⊕
US shoulder	Usually Not Appropriate	○

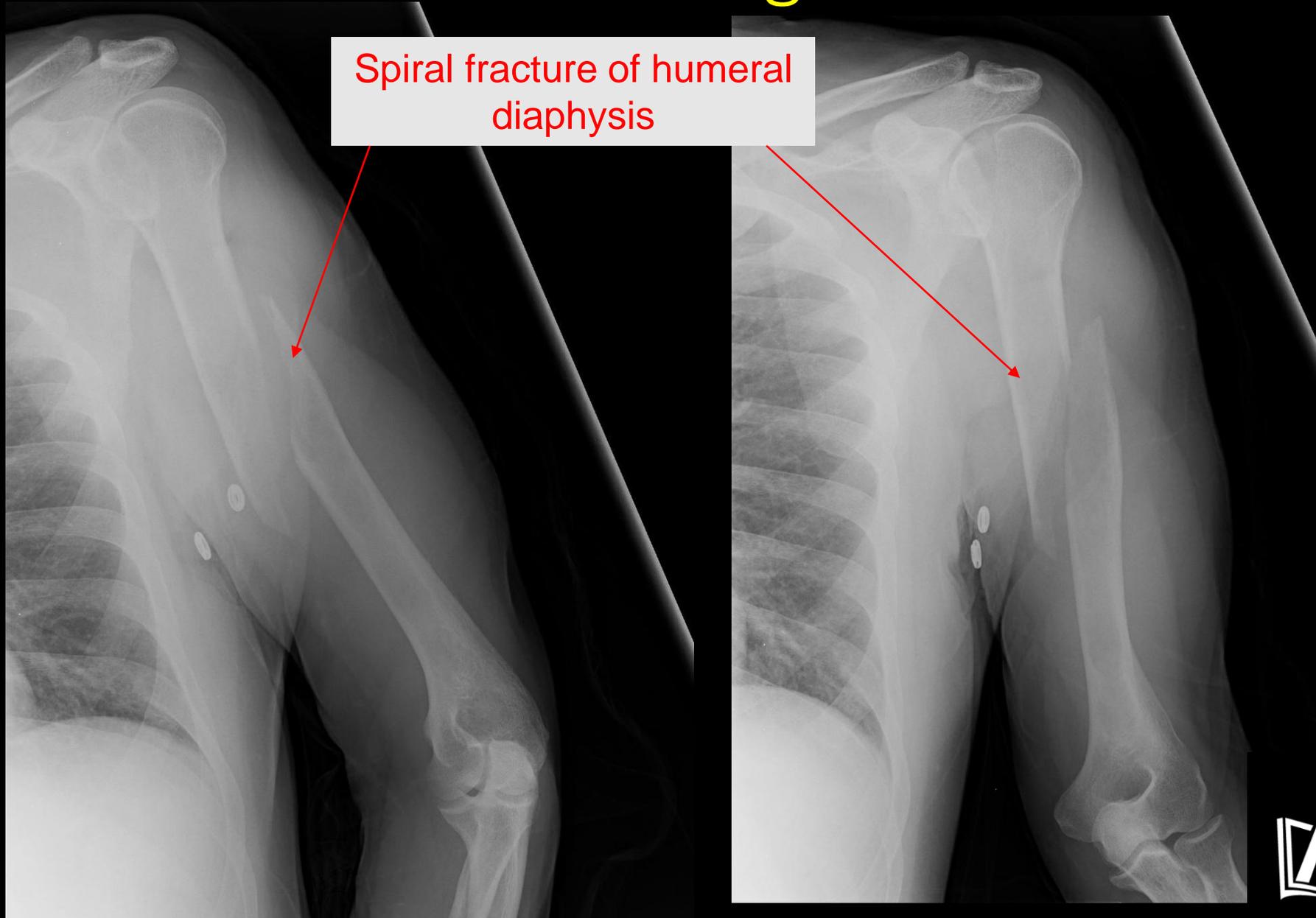
This imaging modality was ordered by the ER physician



Findings

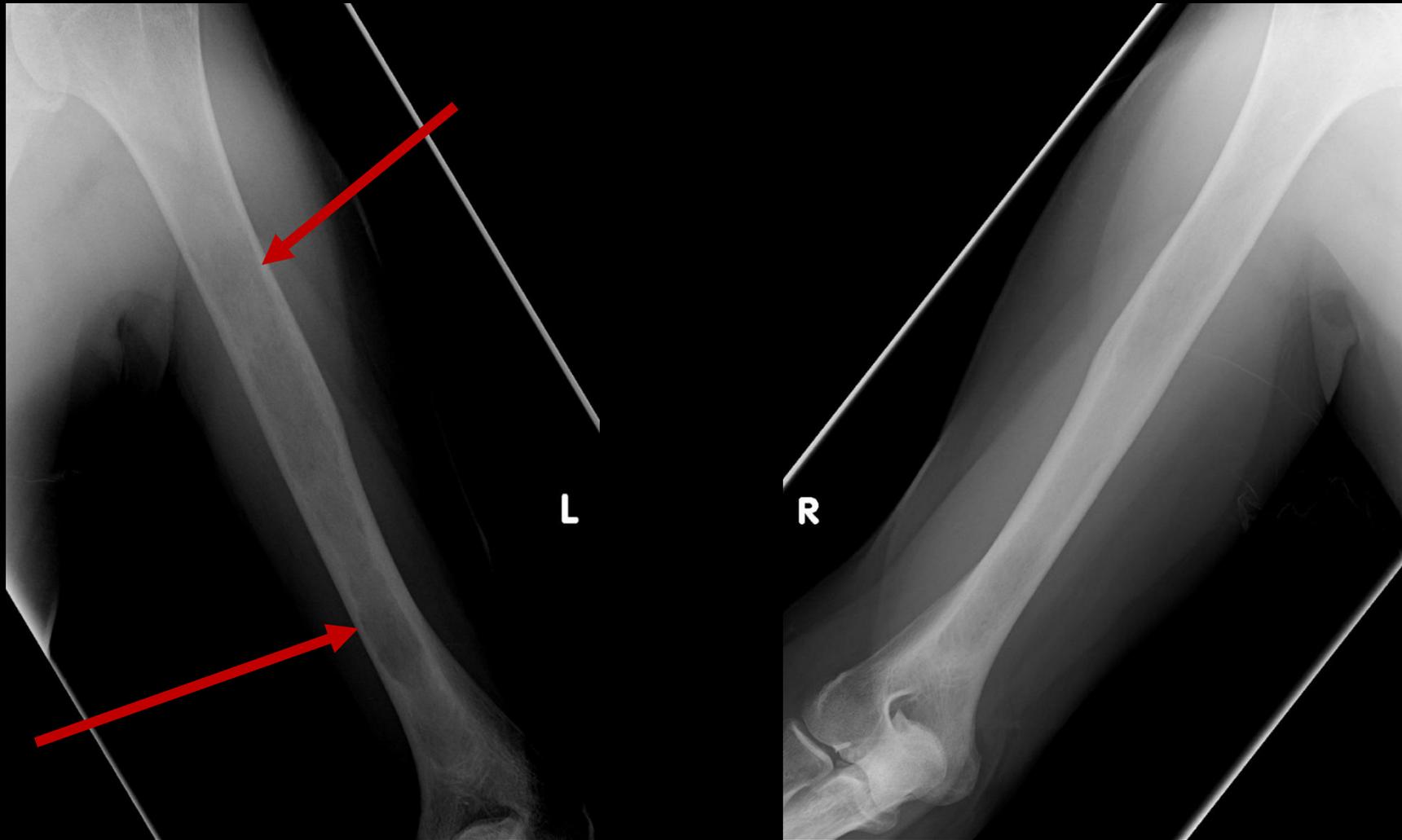


Findings



Spiral fracture of humeral diaphysis

Radiograph two weeks prior to fracture shows endosteal scalloping of the left humerus compared to right



This finding further supports the diagnosis of a pathological fracture

Final Dx:

Pathological displaced spiral fracture of the left humeral diaphysis from multiple myeloma

Treatment and Patient's History of Myeloma

- The patient underwent closed reduction of the left humerus with placement of intramedullary nail
- He was diagnosed with smoldering multiple myeloma 8 years prior.
- He remained under smoldering criteria until 1 year prior, when he presented to ED with sudden onset of shortness of breath and posterior back pain. He was found to have a posterior rib fracture leading to pneumothorax. This prompted a skeletal survey to be conducted which showed multiple new lytic lesions

Multiple Myeloma

- Multiple myeloma is a neoplastic proliferation of plasma cells within the bone marrow.
- It is the most common primary bone neoplasm in adults
- Typical manifestations of disease include anemia, bone pain, elevated creatinine, fatigue/weakness, hypercalcemia, weight loss
- Differential diagnosis: Smoldering multiple myeloma, monoclonal gammopathy of undetermined significance (MGUS), solitary plasmacytoma, amyloidosis

Radiography in Multiple Myeloma

- Radiography plays a key role in this disease for both initial diagnosis and progression
- The modality of choice for suspected myeloma is a skeletal survey
- Radiographic features of multiple myeloma:
 - ❖ Multiple, well-circumscribed lytic bone lesions (appear as punched out lucencies or endosteal scalloping)
 - ❖ Generalized osteopenia
- More suspicious lesions may be further investigated with CT without contrast or MRI

References:

- <https://www-uptodate-com./contents/clinical-features-laboratory-manifestations-and-diagnosis-of-multiple-myeloma>
- <https://acsearch.acr.org/list>
- <https://radiopaedia.org/articles/multiple-myeloma-1>