

AMSER Case of the Month

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69-year-old female with metastatic breast cancer
presenting after a fall onto her right side

Rafael Kuc, MS4

Penn State College of Medicine

Dr. Michael Bruno, MD

Dr. Abigail Locke, MD, PGY-3

Penn State Health Milton Hershey Medical Center, Department of Radiology

Patient Presentation

- HPI:
 - 69-year-old female with metastatic breast cancer transferred to the ED from an outside hospital after falling on her right side at home
 - No loss of consciousness; alert and oriented x4; no head, neck, or back pain; not anticoagulated
 - 10/10 sharp right hip/thigh pain with movement
- PE:
 - Vitals: T 36.8 C; HR 84; RR 16; BP 121/89; SpO2 96%
 - tenderness throughout the right femoral shaft; distal neurovascular exam intact; no midline spinal tenderness
 - Right leg externally rotated and shortened; splinted for comfort

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

Scenario	Scenario ID	Procedure	Adult RRL	Peds RRL	Appropriateness Category
Hip pain, acute, traumatic, initial imaging	3198669	● Radiography hip	1-10 mSv ☼☼☼		Usually appropriate
		● US hip	0 mSv O	0 mSv [ped] O	Usually not appropriate
		● MRI hip without and with IV contrast	0 mSv O	0 mSv [ped] O	Usually not appropriate
		● MRI hip without IV contrast	0 mSv O	0 mSv [ped] O	Usually not appropriate
		● Bone scan hip	1-10 mSv ☼☼☼		Usually not appropriate
		● CT hip with IV contrast	1-10 mSv ☼☼☼		Usually not appropriate
		● CT hip without and with IV contrast	1-10 mSv ☼☼☼		Usually not appropriate
		● CT hip without IV contrast	1-10 mSv ☼☼☼		Usually not appropriate

This imaging modality was ordered by the ER physician

Findings (unlabeled)



AP pelvis (portable)

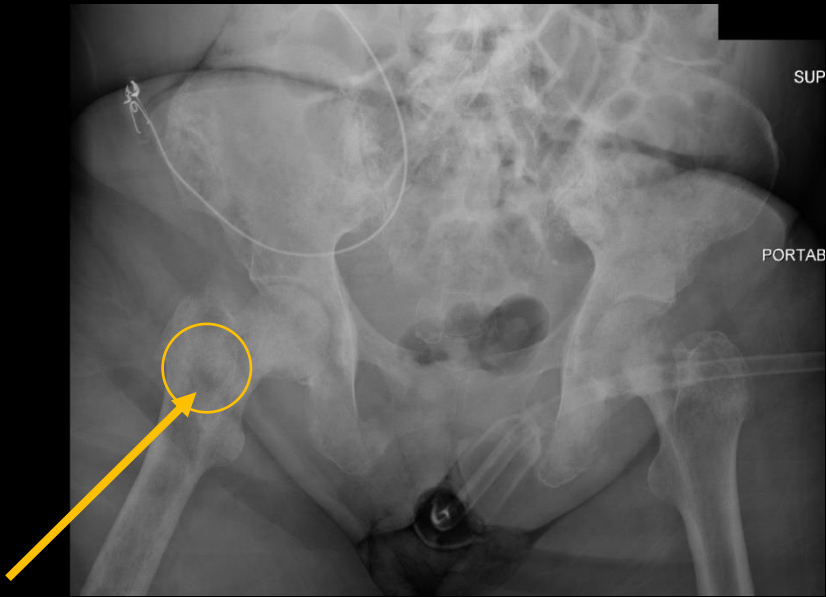


Right femur, view 1

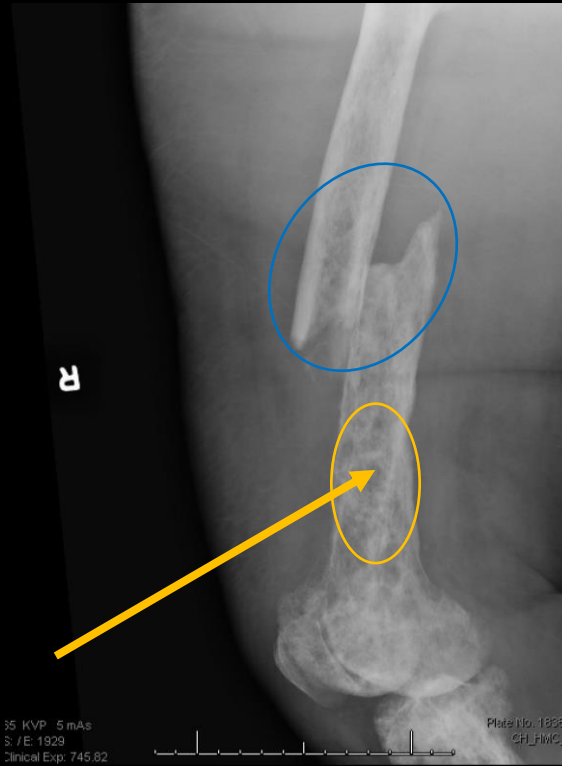


Right femur/hip, view 2

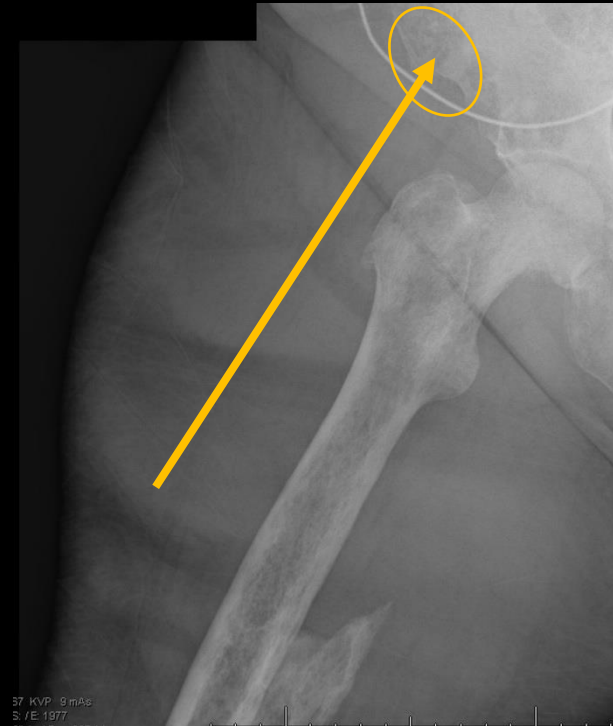
Findings: (labeled)



AP pelvis (portable)



Right femur, view 1



Right femur/hip, view 2

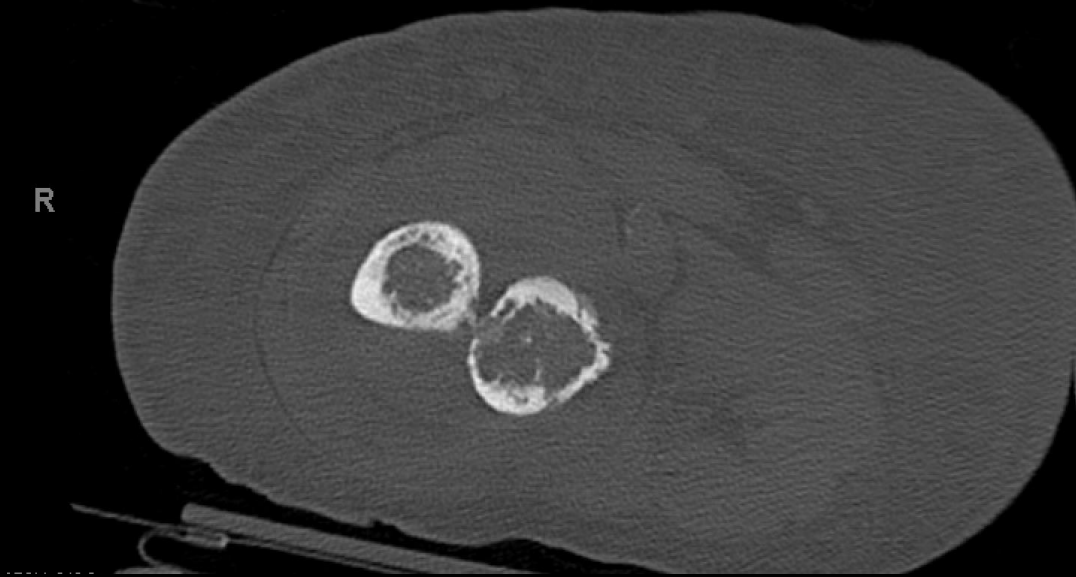
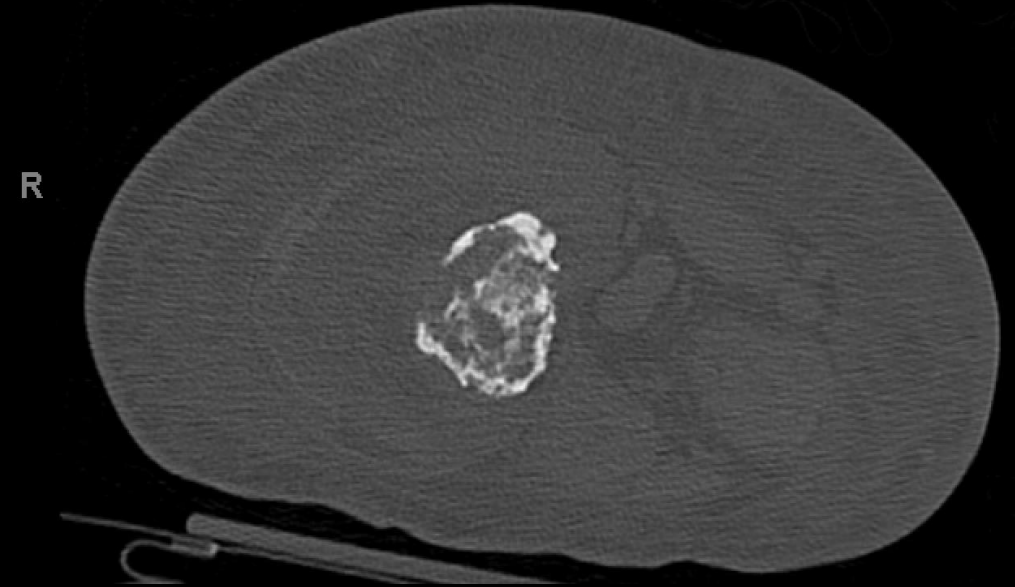
Radiographs show **diffuse osseous metastatic lesions** throughout the pelvis and femur, with a **displaced right femoral fracture**.

Select the next applicable ACR Appropriateness Criteria

This imaging modality was ordered by the ER physician

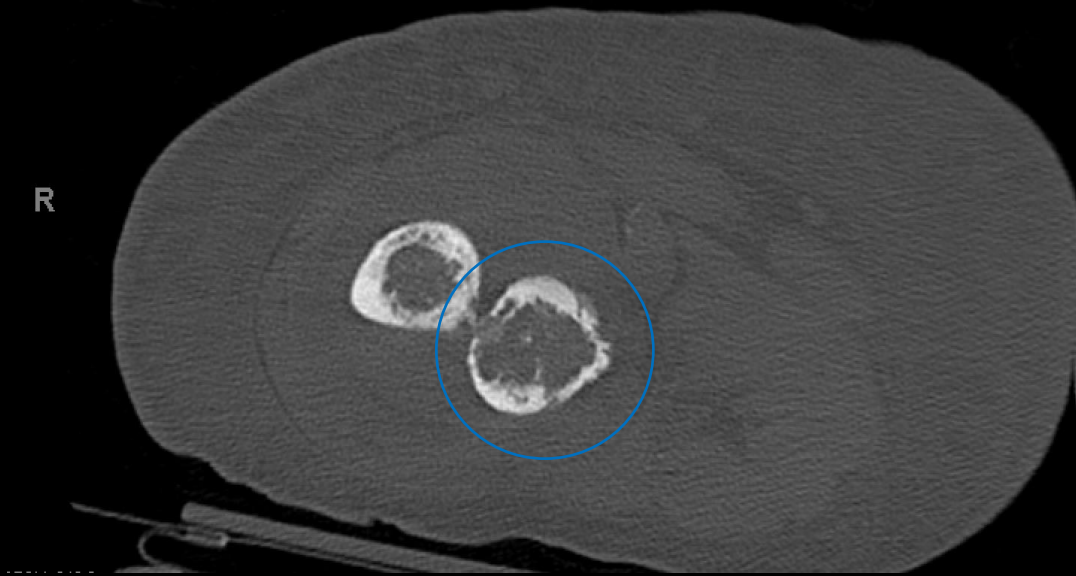
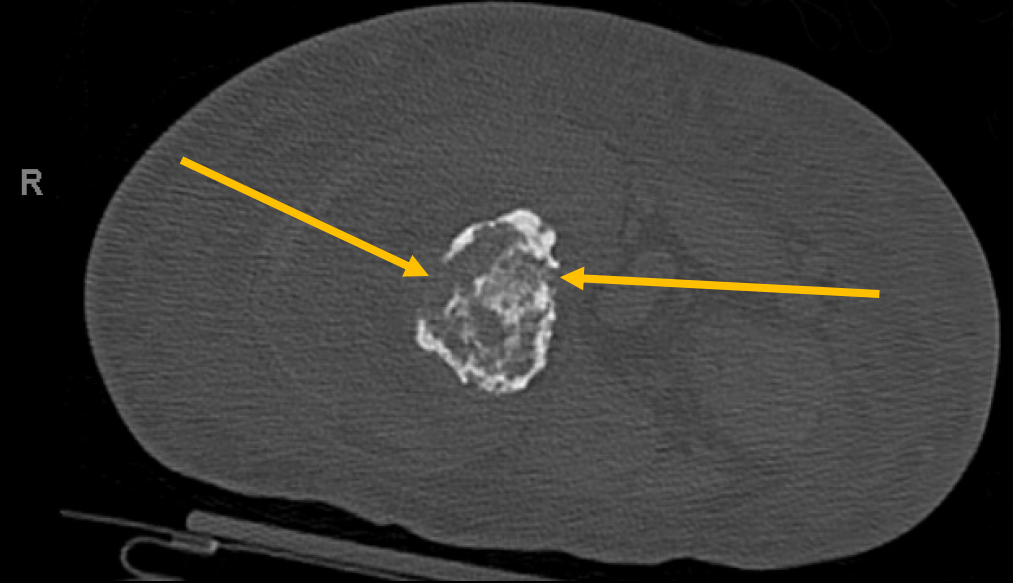
Scenario	Scenario ID	Procedure	Adult RRL	Peds RRL	Appropriateness Category
Hip pain, acute, traumatic, fracture on radiography, next imaging study	3198674	● CT hip without IV contrast	1-10 mSv ☼☼☼		Usually appropriate
		● MRI hip without IV contrast	0 mSv O	0 mSv [ped] O	May be appropriate
		● US hip	0 mSv O	0 mSv [ped] O	Usually not appropriate
		● MRI hip without and with IV contrast	0 mSv O	0 mSv [ped] O	Usually not appropriate
		● Bone scan hip	1-10 mSv ☼☼☼		Usually not appropriate
		● CT hip with IV contrast	1-10 mSv ☼☼☼		Usually not appropriate
		● CT hip without and with IV contrast	1-10 mSv ☼☼☼		Usually not appropriate

Findings (unlabeled)



Axial CT, bone window, through the femoral shaft fracture

Findings: (labeled)



The non-contrast CT confirmed a displaced mid-diaphyseal femoral fracture with posterior displacement and external rotation of the **distal** fracture fragment. Diffuse **mixed lytic/sclerotic metastatic lesions** involving the entirety of the femur. Disease progressed compared to CT 2 years ago.

Final Dx:

Displaced mid-diaphyseal pathologic femur fracture with posterior displacement and external rotation of the distal fragment in the setting of metastatic bone disease

Case Discussion: Epidemiology & Metastatic Bone Disease

- Epidemiology:
 - Breast cancer is one of the most common cancers to metastasize to bone¹
 - Over half of patients with breast cancer will develop skeletal complications (pathological fracture, hypercalcemia, surgery, radiotherapy, etc.)²
- Metastatic Bone Disease:
 - Long bones (like the femur) are crucial for weight-bearing and prone to fracture in the context of metastatic disease³
 - Breast cancer metastases are classically mixed lytic-sclerotic, as seen on this patient's imaging⁴

Case Discussion: Imaging Workup Rationale

- Our patient's pathway: Variant 1 (fall → initial radiographs) → fracture identified → Variant 3 (next study → CT without IV contrast), obtained for full characterization of disease extent and surgical planning⁵
 - IV contrast adds no value for osseous detail
- Known malignancy does not change the initial imaging choice
 - Acute hip pain has no dedicated “known malignancy / suspected pathologic fracture” variant
- MRI is reserved for negative/indeterminate radiographs or suspected ligamentous injury

Case Discussion: Management

- Management of pathologic fracture is multidisciplinary⁶
 - Surgical fixation restores mechanical stability
 - Systemic therapy and bone-modifying agents can help reduce the risk of future fracture⁷
 - Palliative radiation can help manage pain
- Take-home points:
 - In a patient with known malignancy, ACR appropriateness pathway for an acute fracture does not change
 - The patient's oncologic history should shape the differential
 - Multidisciplinary team involvement can help manage further disease progression, manage symptoms, and plan treatment

References:

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5. American College of Radiology. ACR Appropriateness Criteria® acute hip pain. Revised 2024. Accessed September 3, 2026. <https://acsearch.acr.org/docs/3082587/Narrative/>
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