AMSER Case of the Month August 2022

36-year-old male with acute onset right hip pain

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Patient Presentation

- HPI: 36-year-old male presented to ED with sudden onset of right-sided hip pain and low back pain. Patient reported that the pain awoke him from sleep and felt crampy in nature, with occasional sharp pain shooting from lower back into leg. Patient denied trauma.

- PMHx: asthma, sleep apnea

- PSHx: no past surgical history

Patient Presentation: Pertinent Labs

- CBC
  - Hgb: 14.7 g/dL
  - Hct: 44.7
  - WBC: 8.9 x 10^3/µL
- Alkaline phosphatase: 96 IU/L
- ESR: 6 mm/hr
- CRP: 1.00 mg/dL
- Lyme titer: negative

Patient Presentation: Physical Exam

- Vitals
  - Temp: 97.9
  - Pulse: 86
  - Resp: 18
  - BP: 141/86

- PE
  - Active range of motion of right hip limited by pain
  - Tenderness to palpation right lateral hip and groin

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

Variant 1: **Acute hip pain. Fall or minor trauma. Suspect fracture. Initial imaging.**

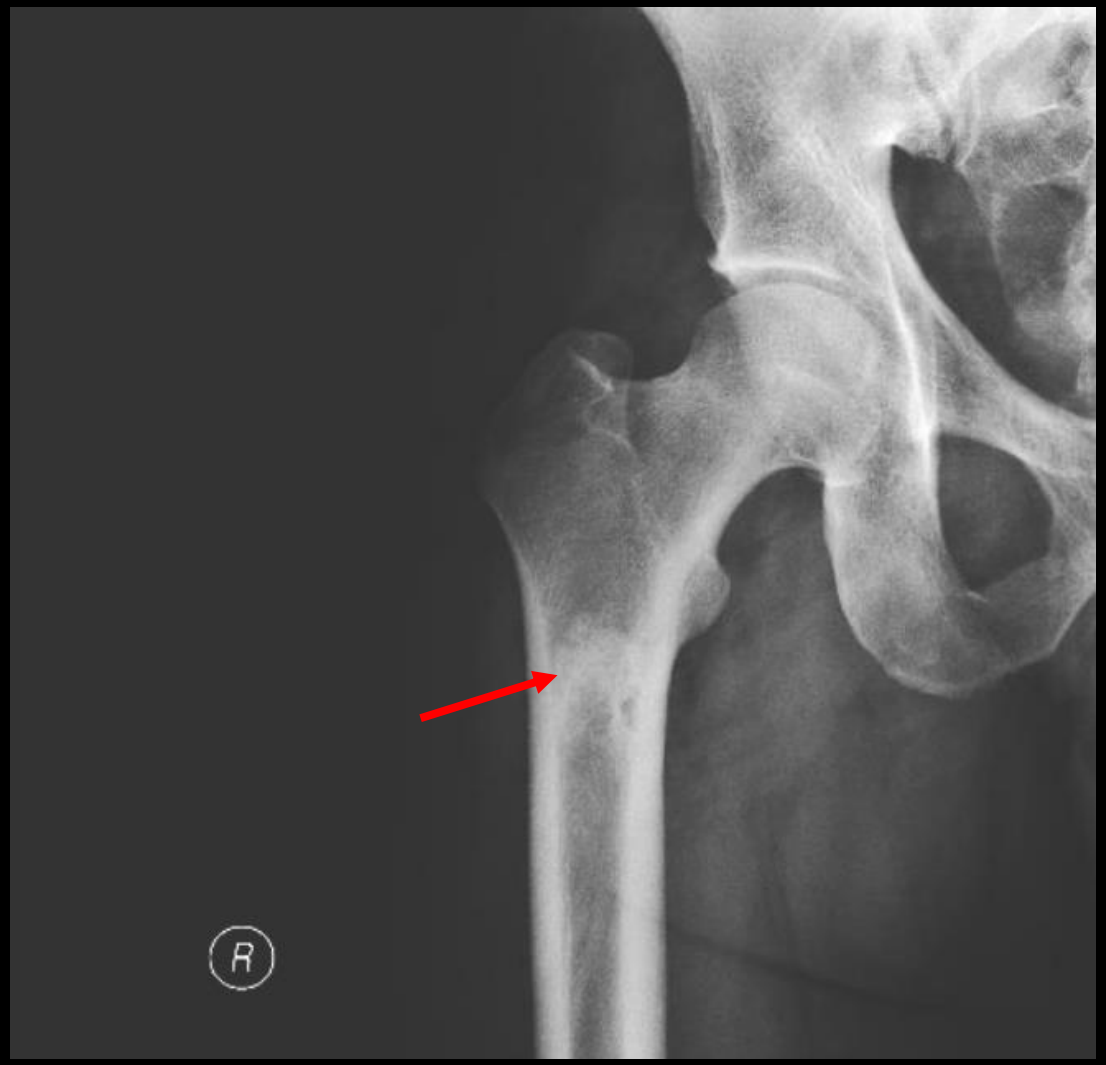
Procedure	Appropriateness Category	Relative Radiation Level
Radiography hip	Usually Appropriate	☢☢☢
Radiography pelvis	Usually Appropriate	☢☢
Radiography pelvis and hips	Usually Appropriate	☢☢☢
CT pelvis and hips with IV contrast	Usually Not Appropriate	☢☢☢
CT pelvis and hips without and with IV contrast	Usually Not Appropriate	☢☢☢☢
CT pelvis and hips without IV contrast	Usually Not Appropriate	☢☢☢
MRI pelvis and affected hip without and with IV contrast	Usually Not Appropriate	O
MRI pelvis and affected hip without IV contrast	Usually Not Appropriate	O
Bone scan hips	Usually Not Appropriate	☢☢☢
US hip	Usually Not Appropriate	O

This imaging modality was ordered by the ER physician

Findings (unlabeled)

XR Femur

Findings: (labeled)



- Sclerotic lesion involving the proximal femoral metaphysis (red arrow)

What Imaging Should We Order?

Because of the patient's painful presentation, further imaging is needed to characterize the lesion and rule out malignancy. What imaging is most appropriate?

Select the applicable ACR Appropriateness Criteria

Variant 2: **Suspect primary bone tumor. Radiographs negative or do not explain symptoms. Next imaging study.**

Procedure	Appropriateness Category	Relative Radiation Level
MRI area of interest without and with IV contrast	Usually Appropriate	O
MRI area of interest without IV contrast	Usually Appropriate	O
CT area of interest without IV contrast	May Be Appropriate	Varies
CT area of interest without and with IV contrast	May Be Appropriate	Varies
CT area of interest with IV contrast	Usually Not Appropriate	Varies
FDG-PET/CT whole body	Usually Not Appropriate	☢☢☢☢
Bone scan whole body	Usually Not Appropriate	☢☢☢
US area of interest	Usually Not Appropriate	O

This imaging modality was ordered by the admitting physician

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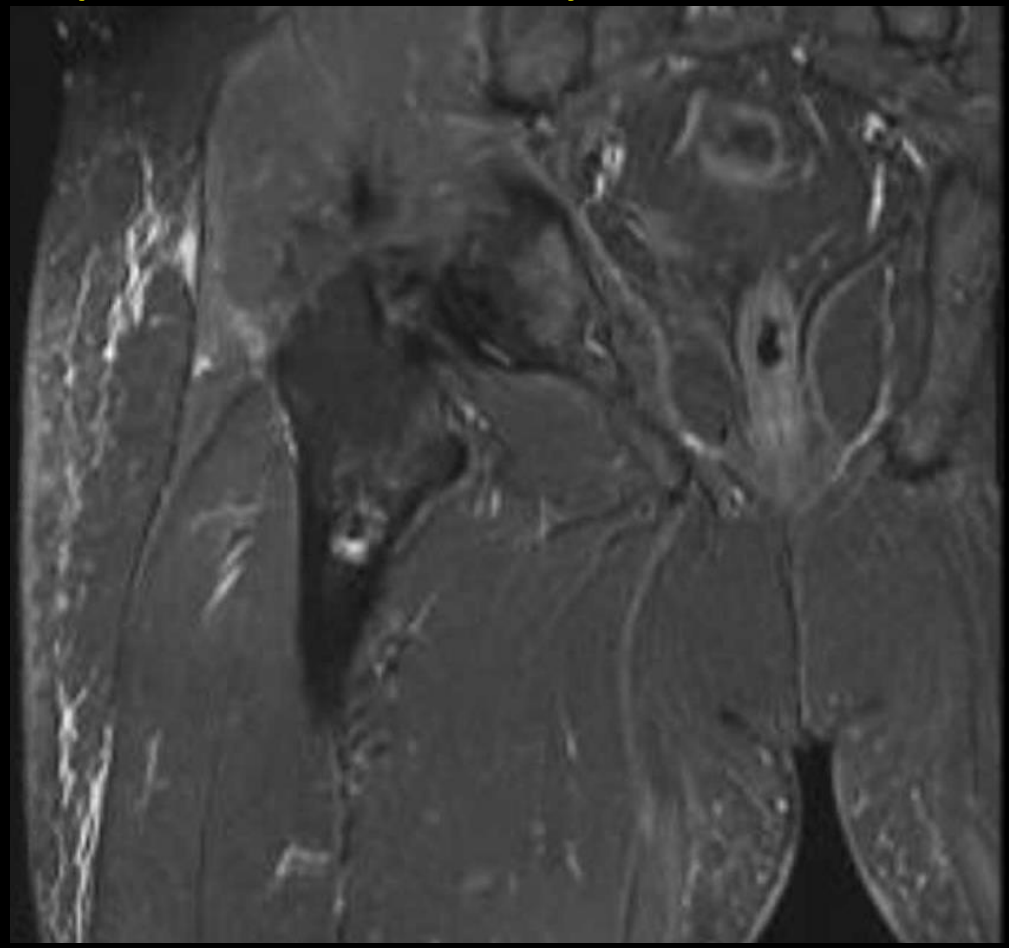
MRI Findings (unlabeled)

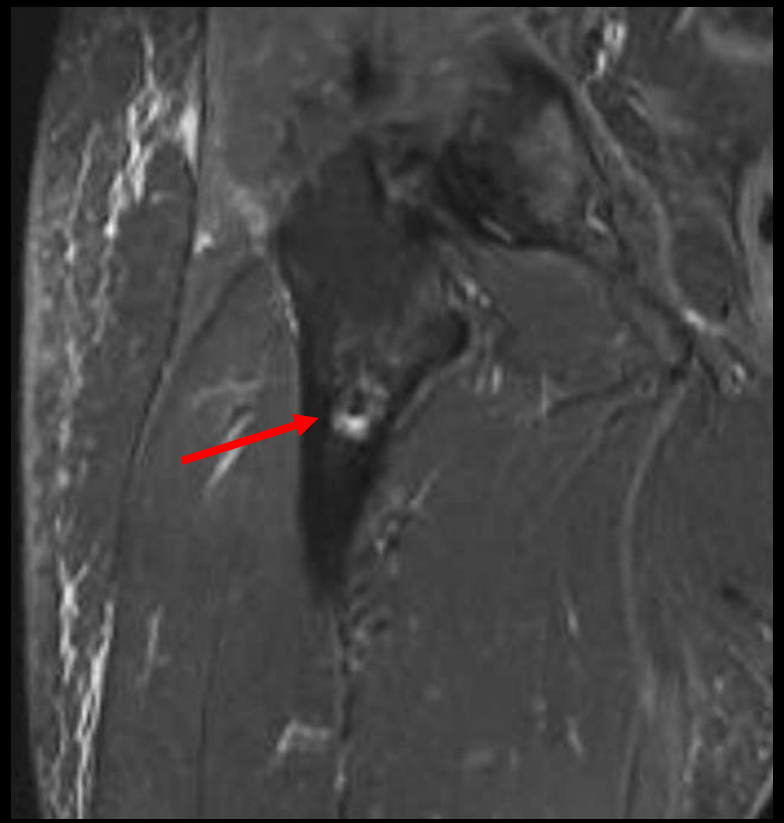
T1 coronal



STIR coronal

MRI Findings: (labeled)

T1 coronal



STIR coronal

- In the central medullary canal of the proximal right femoral shaft: circumscribed bone lesion with a lobular hypointense border corresponding with the sclerotic border on the radiographs
- There are foci of T2 hyperintensity centrally within the lesion consistent with chondroid matrix
- Normal surrounding bone marrow signal
- No bone marrow edema or fracture is seen around the lesion

Final Dx:

Enchondroma of right proximal femur

Case Discussion-Enchondroma

- Overview
  - Benign intramedullary neoplasms of mature hyaline cartilage
  - Occur in any tubular bones, most commonly metacarpals and phalanges of the hands
  - Rarely (<5%) may transform into low-grade chondrosarcomas
- Epidemiology
  - Peak incidence between 10-30 years of age
  - Comprise ~5% of all bone tumors and ~17.5% of benign bone tumors
- Pathophysiology
  - Not fully understood
  - Arise from chondrocytes, then become encased in mature bone

Case Discussion-Enchondroma

- Symptoms
  - Enchondromas are asymptomatic, though may present with pain in small bones if there is pathological fracture
  - Transformation into low-grade chondrosarcoma may present with pain
- Treatment
  - Asymptomatic enchondromas require no treatment
  - Pathological fractures can be surgically treated with curettage and bone graft

Case Discussion-Enchondroma

- Case
  - Further workup determined that patient's hip pain was referred from sciatica secondary to degenerative disc disease
  - Enchondroma of femur required no further workup

References:

- Biondi BL, Varacallo M. Enchondroma. In: *StatPearls*. NCBI Bookshelf version. StatPearls Publishing: 2022. Accessed June 10, 2022. https://www.ncbi.nlm.nih.gov/books/NBK536938/\
- Garcia RA, Demicco EG, Klein MJ, Schiller AL. *Rubin's Pathology: Clinicopathologic Foundations of Medicine, 7e.* ClinicalKey; 2014;chapter 30. Accessed June 10, 2022.
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