Appropriate Utilization of Musculoskeletal Imaging

RADY 401

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Department of Radiology
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Objective

5 Clinical Scenarios

• When to Order
  – History and Physical

• What to Order
  – ACR Appropriateness Criteria©

• How to Order
  – Contrast vs. Non-Contrast

Use of laptops and hand-held devices is highly encouraged!
1st Patient
Clinical Scenario #1

19 yo M UNC baseball pitcher presents with acute right shoulder pain after the 6th inning.
Clinical Scenario #1

How would you like to examine this patient?
Clinical Scenario #1

- Shoulder Exam
  - Inspection
  - Palpation
  - Range of Motion
  - Strength
  - Special Tests

Clinical Scenario #1

- On exam, you note diffuse swelling, elicit pain with overhead motion, and observe a + O’Brien Test.

What test would you order next? Why?
Clinical Scenario #1

Normal or Abnormal?
Clinical Scenario #1

Normal or Abnormal?
Clinical Scenario #1
If the radiographs are normal, and you suspect a labral tear, what is the next appropriate study?
Clinical Scenario #1

What type of exam is this?
Clinical Scenario #1

Cor T1FS – Superior labral anterior to posterior tear (SLAP)
2\textsuperscript{nd} Patient
Clinical Scenario #2

• 92 yo W presents after fall, now with hip pain.
Clinical Scenario #2

• On exam, she is unable to bear weight and has limited ROM secondary to pain.

What test would you order next? Why?
Clinical Scenario #2

Normal or Abnormal?
Clinical Scenario #2

If the radiographs are normal, what is the next appropriate study?
Clinical Scenario #2

Bilateral Sacral Ala Fractures
Clinical Scenario #2

Right superior/inferior pubi rami fractures
3rd Patient
Clinical Scenario #3

- 21 yo W UNC soccer player presents with right knee pain after twisting injury during a match at Fetzer Field.
Clinical Scenario #3

• On exam, she is noted to have a locking sensation with flexion/extension and found to have a + McMurray Test

What test would you order next? Why?
Clinical Scenario #3

Normal or Abnormal?
Clinical Scenario #3

If the radiographs are normal, what is the next appropriate study?
Clinical Scenario #3

Normal
Bucket Handle Tear
Meniscal Tear Types

- **Bucket-handle Tear**
  - Intercondylar notch-displaced, full thickness longitudinal-vertical tear that propagates anterior and posterior
4th Patient
Clinical Scenario #4

• 20 yo M UNC Basketball player, playing in NCAA Final Four tournament game, goes up strong for a block, lands on another players foot, and grabs his ankle in pain.
Clinical Scenario #4

- Your History and physical exam should assess:
  
  A. Medial/lateral malleolar tenderness
  
  B. O’Brien Test
  
  C. Inability to bear weight after injury and in ED
  
  D. A and C
  
  E. All of the above
Clinical Scenario #4

- Your History and physical exam should assess:
  
  A. Medial/lateral malleolar tenderness
  
  B. O’Brien Test → (SLAP Tear)
  
  C. Inability to bear weight after injury and in ED
  
  D. A and C
  
  E. All of the above
Obtain Ankle X-Ray Series if:

Pain in malleolar zone and any of these findings:

1. Bone tenderness at A, or
2. Bone tenderness at B, or
3. Inability to bear weight both immediately and in ED

Clinical Scenario #4

• Your pt was unable to bear weight after the injury and in the ED and has tenderness in the malleolar zone but not in the midfoot zone. What is the most appropriate next step?
  A. Ankle and foot series radiographs
  B. Ankle series radiographs only
  C. Ankle MRI
  D. Foot series radiographs only
  E. Ankle CT
Clinical Scenario #4

Your pt was unable to bear weight after the injury and in the ED and has tenderness in the malleolar zone but not in the midfoot zone. What is the most appropriate next step?

A. Ankle and foot series radiographs
B. Ankle series radiographs only
C. Ankle MRI
D. Foot series radiographs only
E. Ankle CT
Ottawa Foot Rules

Obtain Foot X-Ray Series if:
Pain in midfoot zone and any of these findings:
1. Bone tenderness at C, or
2. Bone tenderness at D, or
3. Inability to bear weight both immediately and in ED

Clinical Scenario #4

Normal or Abnormal?
What would you recommend radiographs of next?
Clinical Scenario #4

Maisonneuve Fracture
5th Patient
Clinical Scenario #5

• 76 yo M with PMHx of DMII, HTN, PVD, presents with fever, chills, foot swelling and ulceration of his right foot.
Clinical Scenario #5

• Upon exam, the ulcer is located over the plantar aspect of the lateral forefoot and probes to bone.

What test would you order next? Why?
Clinical Scenario #5

Normal or Abnormal?

Clinical Scenario #5

What is the next most appropriate study?
Clinical Scenario #5

Would you give IV contrast?
What if the GFR was 5 (DMII with ESRD), would you order CT or MRI without contrast?
Clinical Scenario #5

Normal or Abnormal?

Clinical Scenario #5

Normal or Abnormal?

Conclusion

• Good H&P can direct imaging
• Use the ACR Appropriateness Criteria©
• When in doubt, start with radiographs
• Contrast → Tumor, Extent of Infection/Inflammation
• If ?’s → Consult a Radiologist
Thank You!
References