# Rotator Cuff Repair

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RAD 4006

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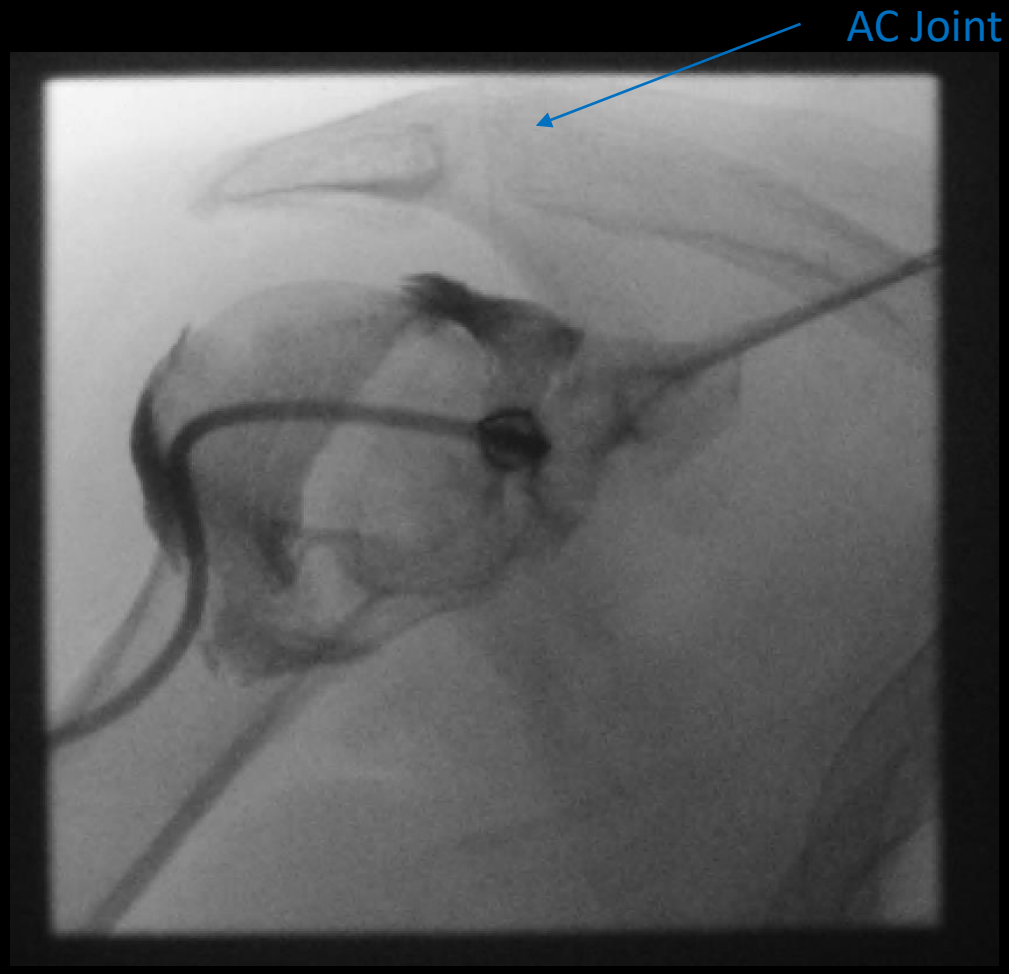
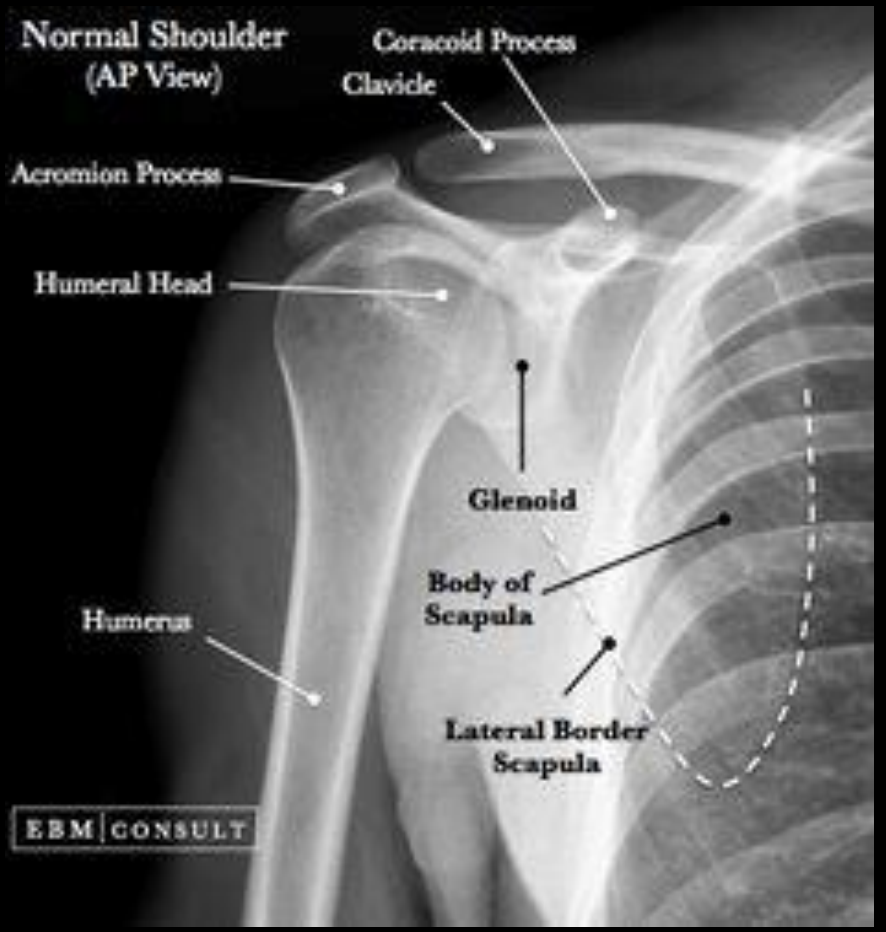
# Clinical History

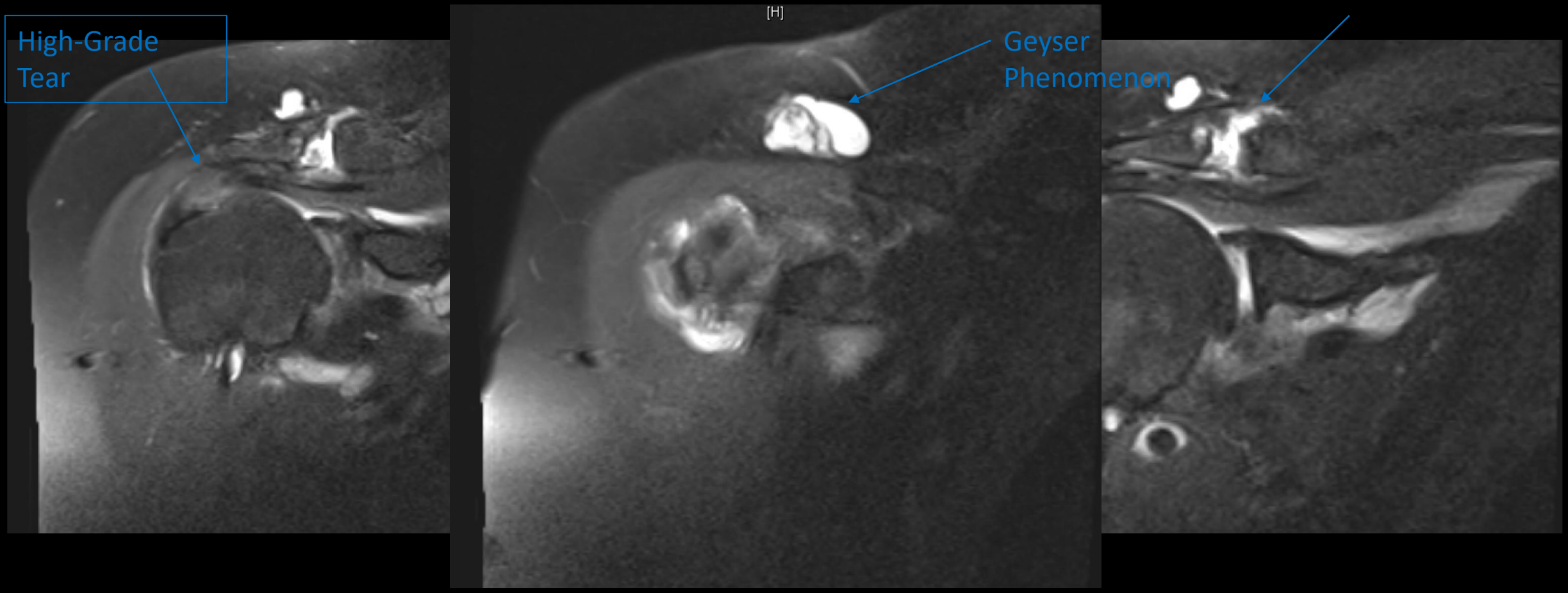
- Pt is a 62 y.o. F with a pmh of rheumatoid arthritis and osteoporosis who presents to orthopedics.
  - CC: Pain in the R shoulder
  - Pt reports a fall about 1 month ago and since that time pain and weakness with lifting and rotary movements
  - PE: 140 degrees of forward elevation and 135 degrees of abduction with guarding and pain. External rotation is to 60 degrees, which is symmetric to the other side. Minimal to no crepitation. Rotator cuff strength shows 4/5 abduction strength. Subscapularis testing is positive and weak. Distally, she has 5/5 motor strength and sensation present throughout. She has intact pulse and brisk capillary refill.
  - Vit D: 31, PTH: 28, Phos: 3.9, Alk Phos: 18

# Xray Rt Shoulder



# MRI Right Shoulder: 6/19/2017

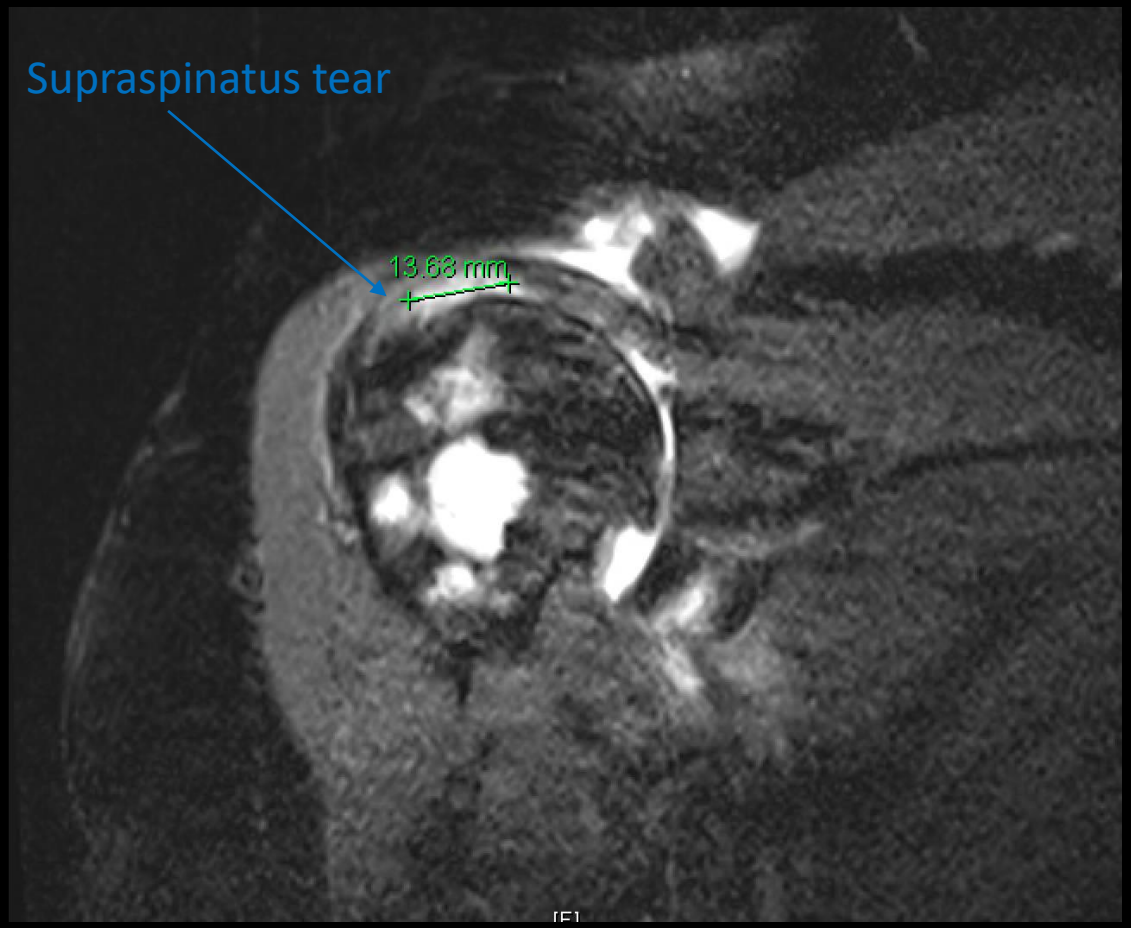


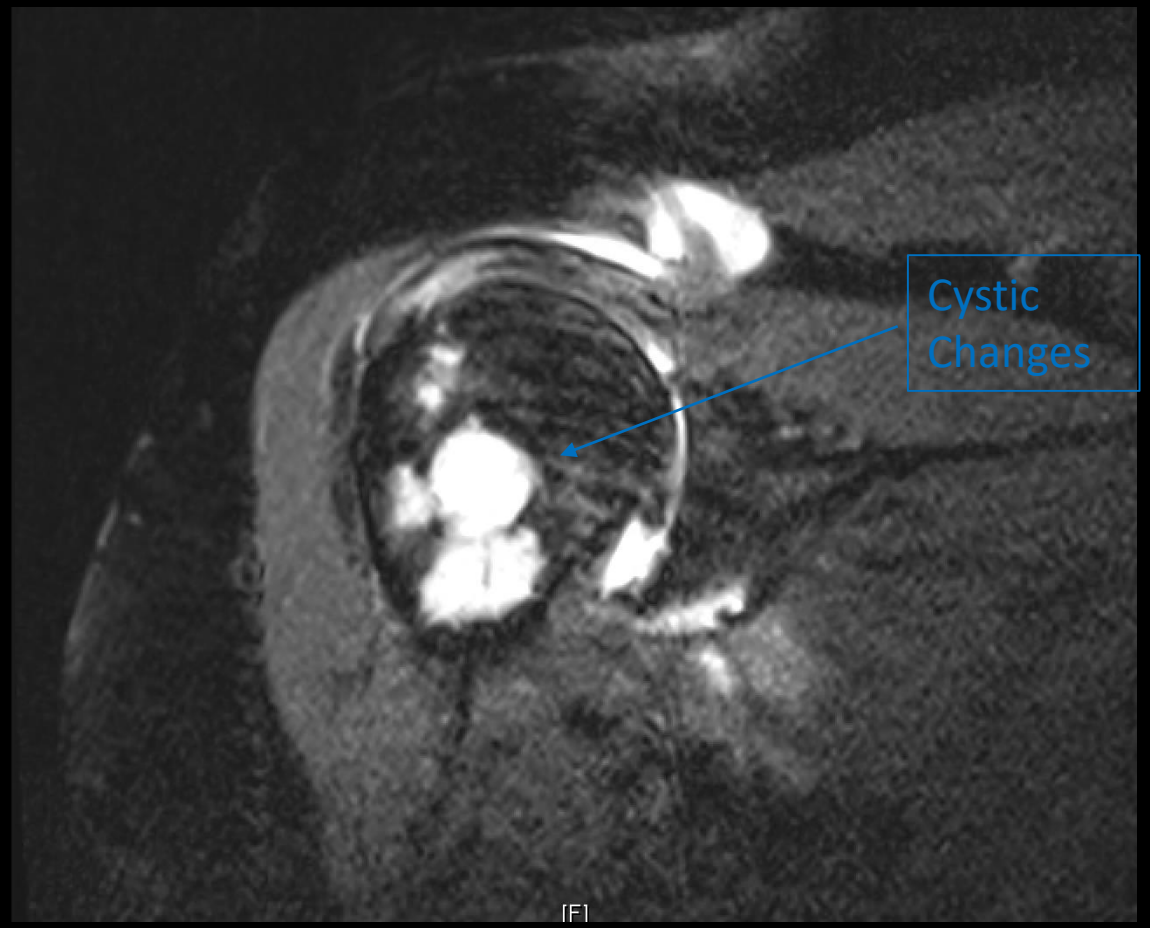
# Treatment: Rotator Cuff Repair: 3/20/2018

- Repair of Supraspinatus, Infraspinatus, and subscapularis
  - Full-thickness tear found intra-operatively
- Xenograft Patch Augmentation
- Extensive Debridement of of chondromalacia of GH joint
- Biceps Tenotomy

- Post-op:
  - Significant Improvement in pt pain and functionality
  - However, in February 2020, pt presents with 2-week h/o pain in R shoulder after bumping into corner of wall…

# Post-op MRI: 2/26/2020



# Highlight and summarize key imaging findings

- Full Thickness Supraspinatus tear on initial presentation
  - Corresponds with weakness with abduction
- High- Grade Chondrosis of AC joint
- Post-op MRI
  - Partial thickness tearing of supraspinatus
  - Diffuse Cystic changes in humeral head
  - Advanced Degenerative Changes of GH joint
- Sugaya Grade II Classification of Rotator Cuff Healing

| Grade | Description | Number of shoulders |
|---|---|---|
| I | Sufficient thickness with homogeneously low intensity | 27 |
| II | Sufficient thickness with partial high intensity | 13 |
| III | Insufficient thickness without discontinuity | 8 |
| IV | Presence of a minor discontinuity | 3 |
| V | Presence of a major discontinuity | 2 |

Description and breakdown of study patients by MRI Sugaya classification [58]. Patients graded I–III were considered to be healed and IV–V to have re-torn

# Differential Diagnosis

- Tear of Anterior Supraspinatus
- Osteoarthritis of R shoulder
- Rheumatoid Arthritis of R shoulder

# Discussion

- Rotator Cuff Tears result from trauma
  - Macro-trauma is often the culprit in younger pts
    - falling on an outstretched hand, by an unexpected force when pushing or pulling, or during shoulder dislocation.
  - Micro-trauma causes tendon degeneration and with insufficient healing, leads to degenerative tears, amplified in patients with arthritis
- The repair of Full-Thickness tears is still controversial
  - Studies report failure rates of 21% to 91%
- debridement/partial repair and/or reconstructions *may be appropriate* in chronic massive tears
  - Case by Case basis

# Continued discussion

- Cystic Changes are seen in up to 50% of cases after rotator cuff repair.
  - They can interfere with healing and make surgery for the re-tear difficult
- Other Factors Influencing repair healing:
  - Older age, larger tear size, worse muscle quality, greater muscle-tendon unit retraction, smoking, osteoporosis, diabetes and hypercholesterolemia
- Insufficient data studying efficacy of repair in patients with RA
  - Some studies show effective pain control but limited improvement in functionality
  - Elevated CRP and history of steroid use associated with worse outcomes

# Treatment

- Given cystic changes and degeneration in shoulder, arthroscopic repair not recommended
- Will continue with non-operative management
  - Physical Therapy
  - Steroid Injections
- Candidate for reverse-shoulder replacement if failed non-operative management

# Final Diagnosis

- Full thickness tear of Right Supraspinatus
- Right Shoulder Glenohumeral Chondromalacia

# ACR appropriateness Criteria

- This case effectively followed the ACR Appropriateness Criteria
  - Can include a screenshot of the table with the modality completed highlighted

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

| Procedure | Appropriateness Category | Relative Radiation Level |
|---|---|---|
| Radiography 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 | O |
| MRI shoulder without and with IV contrast | Usually Not Appropriate | O |
| MRI shoulder without IV contrast | Usually Not Appropriate | O |
| Bone scan shoulder | Usually Not Appropriate | ☢☢☢ |
| US shoulder | Usually Not Appropriate | O |

**Variant 2:** **Traumatic shoulder pain. Nonlocalized shoulder pain. Negative radiographs. Next imaging study.**

| Procedure | Appropriateness Category | Relative Radiation Level |
|---|---|---|
| MRI shoulder without IV contrast | Usually Appropriate | O |
| CT arthrography shoulder | May Be Appropriate | ☢☢☢☢ |
| MR arthrography shoulder | May Be Appropriate | O |
| US shoulder | May Be Appropriate (Disagreement) | O |
| CT shoulder without IV contrast | Usually Not Appropriate | ☢☢☢ |
| CT shoulder with IV contrast | Usually Not Appropriate | ☢☢☢ |
| CT shoulder without and with IV contrast | Usually Not Appropriate | ☢☢☢ |
| FDG-PET/CT skull base to mid-thigh | Usually Not Appropriate | ☢☢☢☢ |
| MRI shoulder without and with IV contrast | Usually Not Appropriate | O |
| Bone scan shoulder | Usually Not Appropriate | ☢☢☢ |

# Cost of Imaging

- 2 Shoulder X-ray 2 views: $1569.50
  - $784.75 each
- 2 MR Shoulder w/ Contrast = $10,138.50
  - $5069.25 each

TOTAL = $11,708.00

Prices from Memorial Hermann charge description master:

https://www.memorialhermann.org/patients-caregivers/pricing-estimates-and-information/

# Take Home Points / Teaching points

- MRI is often necessary to Dx Rotator Cuff Tear
- Pay attention to the Physical Exam signs! Imaging may not reveal the whole tear
- Full-thickness tears are famous for not responding well to repair

# References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Questions?