

# Ultrasound of the Post-operative Shoulder

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## Disclosures

- Consultant: Bioclinica
- Contractor: POCUS PRO
- Advisory Board: Philips
- Book Royalties: Elsevier
- Not relevant to this lecture

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Fundamentals of Musculoskeletal Ultrasound  
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## Objectives:

- Understand the appearances of the rotator cuff after surgery
- Recognize rotator cuff re-tear
- Familiar with ultrasound appearances after biceps tenodesis and arthroplasty

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## Outline:

- Rotator cuff repair
- Biceps tenotomy and tenodesis
- Shoulder replacement

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## Rotator Cuff Repair: surgery

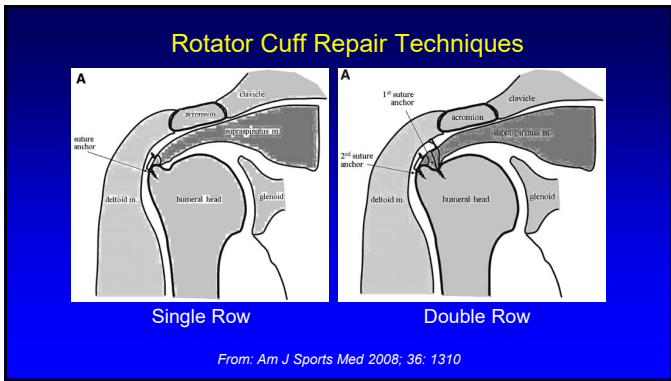
- Arthroscopy
- Open surgery
  - Deltoid detachment and reattachment
- Mini-open
  - Arthroscopy-assisted
  - Split deltoid for access without detachment

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## Rotator Cuff Repair: surgery

- Partial tear repair:
  - Articular <50% and bursal: debridement
  - Articular >50%: repair or convert to full tear
- Full-thickness repair:
  - Trans-osseous fixation + trough
  - Decorticated tuberosity + direct apposition

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### Rotator Cuff Repair: surgery

- Subacromial-subdeltoid bursa:
  - Debrided or resected
- AC joint:
  - Subacromial enthesophyte spur resection
  - AC joint osteophyte resection
  - Coracoacromial ligament release from acromion
  - Distal clavicle resection: Mumford procedure

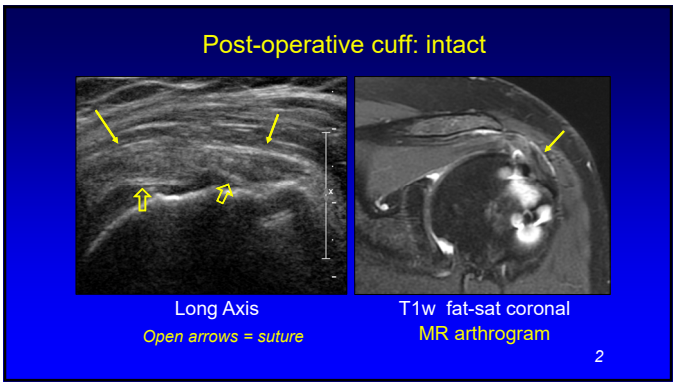
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### Repaired Cuff: ultrasound

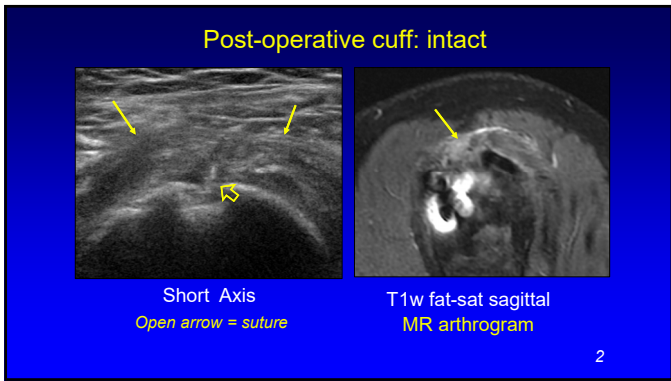
- Post-op intact tendon:
  - Variable and heterogeneous echogenicity
  - Variable thickness
- Reimplantation trough
- Echogenic sutures & anchors

*Jacobson et al. Sem Musculo Radiol 2011; 15:320*

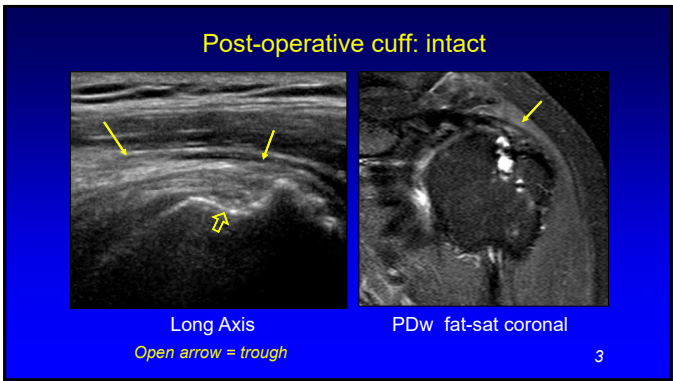
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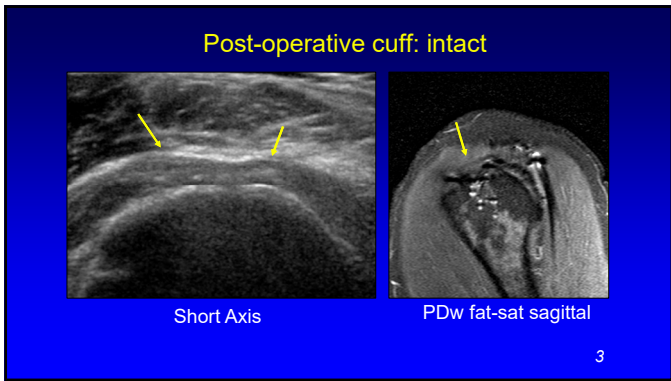
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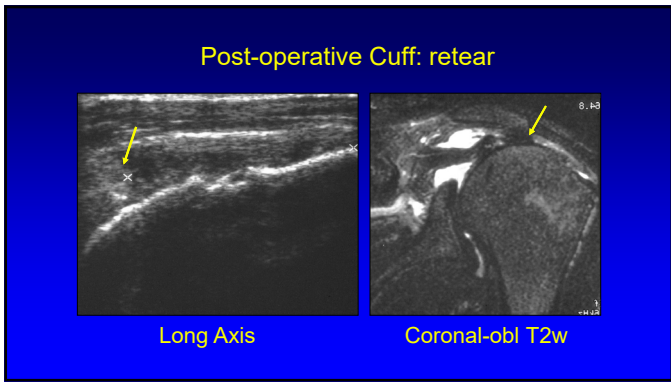


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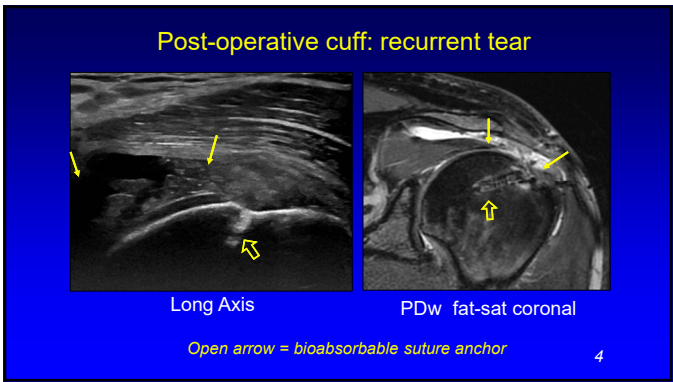
Post-operative Rotator Cuff

- Recurrent tear:
  - Defined tendon defect
    - Ultrasound: anechoic or hypoechoic
    - MRI: fluid or contrast signal
  - Tendon non-visualization (ultrasound)
  - Tendon retraction

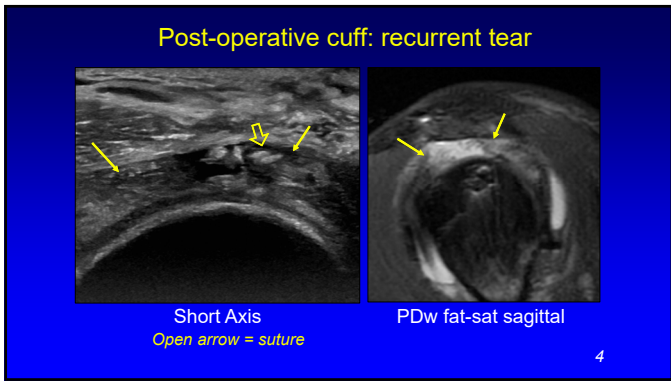
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Recurrent Cuff Tear: ultrasound results

- Sensitivity = 95%, specificity = 90%, accuracy = 94%<sup>1</sup>
- Tendon defects at 1 year may heal<sup>2</sup>
- Defects increase in size with decreased strength but may be asymptomatic<sup>3</sup>
- Structural integrity does not correlate with pain or function<sup>4</sup>

<sup>1</sup>Yen, Clin Imaging 2004; 28:69  
<sup>2</sup>Nho, Am J Sports Med 2010; 37:1938  
<sup>3</sup>Dodson, Am J Sports Med 2010; 38:35  
<sup>4</sup>Russell RD et al. JBJS 2014; 96A:265

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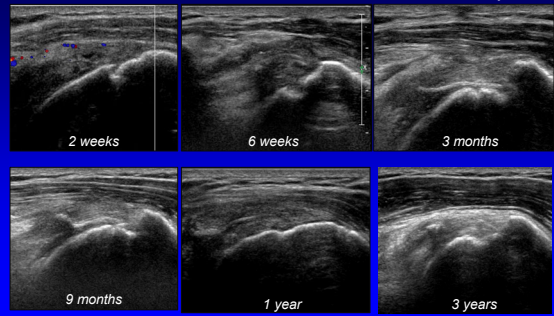
### Rotator Cuff Repair:

- How does the repaired tendon appear at specific time points after surgery?
- How does the appearance change over time?
- When should the tendon appear "normal"?

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### Post-operative Cuff: Intact

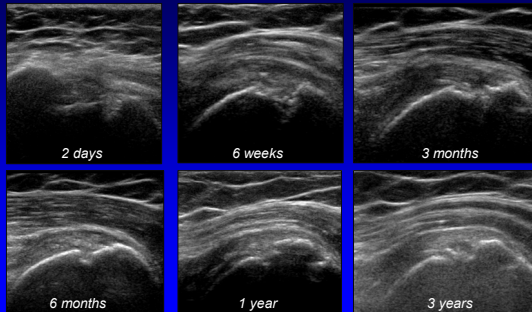
Subject B.A.



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### Post-operative Cuff: Intact

Subject J.C.



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### Rotator Cuff Repair:

- Most recurrent tears: within 3 months
- Tendons start to look "normal" by 6 to 9 months
- Focal defects are equivocal, may be post-surgical, may disappear
- Recurrent tears tend to be larger or get larger
- If unsure, get follow-up scan

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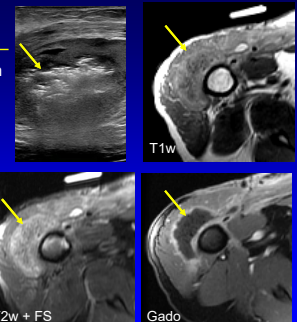
### Rotator Cuff Repair:

- Patients with intact tendons may have continued symptoms
- Patients with recurrent tears may be asymptomatic
- Large recurrent tears are more likely symptomatic

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### Gossypiboma

- Retained surgical sponge or cotton
  - Textiloma
  - Latin "gossypium" = cotton
  - Swahili "boma" = place of concealment
- Complications:
  - Foreign body response
  - Infection
- May remain silent for years



AJR 2009; 193:S94

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### Outline:

- Rotator cuff repair
- **Biceps tenotomy and tenodesis**
- Shoulder replacement

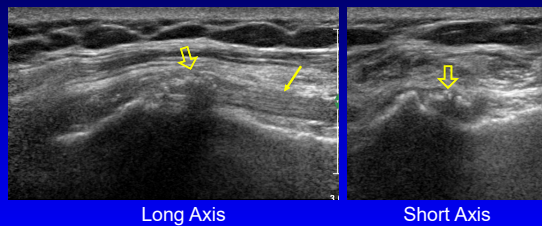
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### Biceps Tendon:

- Tenotomy: surgical transection of intra-articular aspect of long head biceps brachii tendon
- Tenodesis: surgical transection + fixation of proximal stump to intertubercular groove

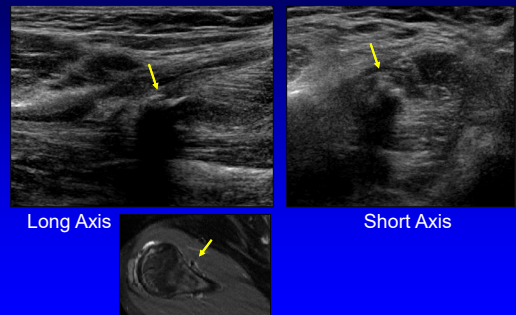
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### Biceps Tendon: tenodesis



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### Biceps Tendon: failed tenodesis



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### Outline:

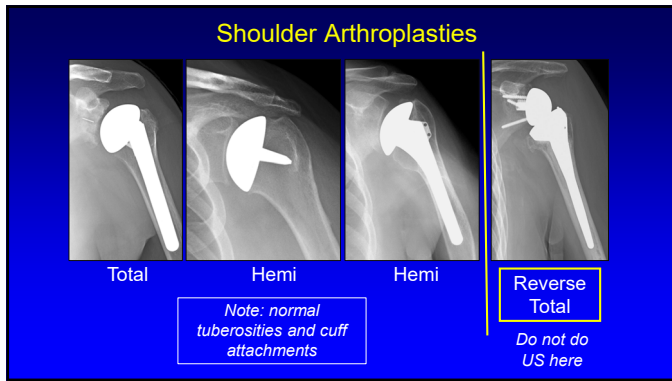
- Rotator cuff repair
- Biceps tenotomy and tenodesis
- **Shoulder replacement**

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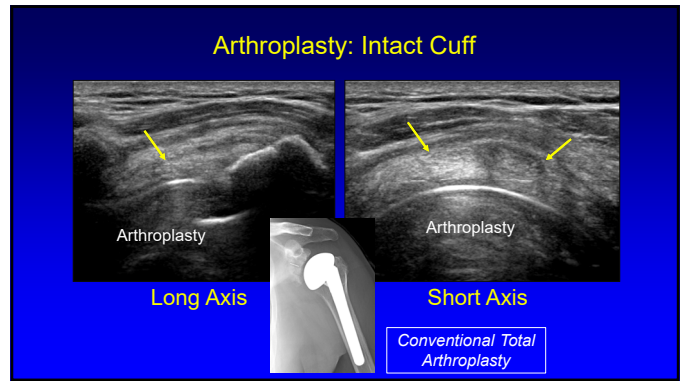
### Shoulder Arthroplasty:

- Total shoulder arthroplasty or hemiarthroplasty
  - Rotator cuff normally inserts onto tuberosities
- Reverse total shoulder arthroplasty:
  - Used when tear of rotator cuff
  - No cuff or tuberosities

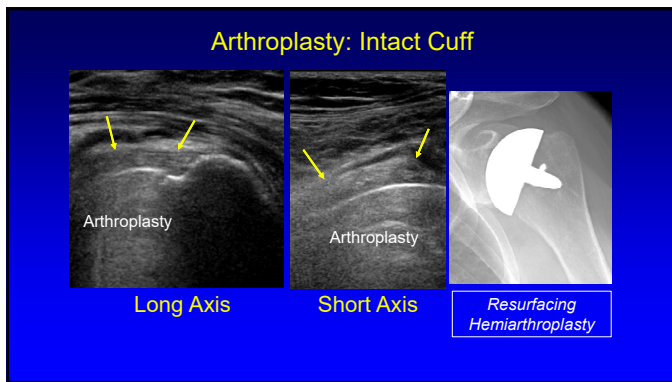
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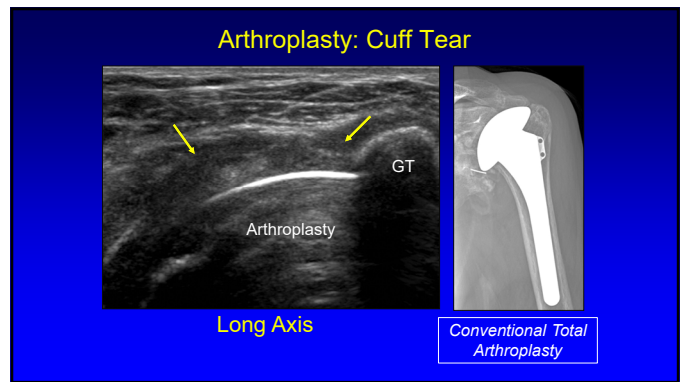
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- ### Take-home Points
- Repaired rotator cuff:
    - Most recurrent tears: within 3 months
    - Appears somewhat normal by 6 – 9 months
    - Diagnose retear if obvious defect
    - If equivocal, follow-up scan
  - Tenodesis
    - Suture anchor in bicipital groove
  - Arthroplasty:
    - Use greater tuberosity landmarks

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