

Shoulder Ultrasound: Beyond the Rotator Cuff

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Disclosures

- Consultant: Bioclinica
- Book Royalties: Elsevier
- Not relevant to this lecture

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Fundamentals of Musculoskeletal Ultrasound are
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Miscellaneous Pathology:

- Biceps brachii tendon
- Subacromial-subdeltoid bursa
- Acromioclavicular joint
- Labrum
- Greater tuberosity

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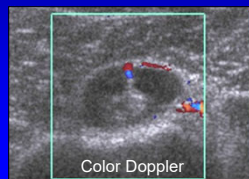
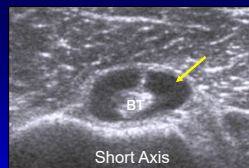
Biceps Brachii: pathology

- Tendinosis
- Tear: partial and full-thickness
- Subluxation and dislocation
- Association with:
 - SLAP and anterior rotator cuff tears
- Causes: acute injury, repetitive injury, degeneration

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Biceps Tendon:

- Glenohumeral joint effusion:
 - Collects around biceps tendon
 - Tendon sheath communication
 - Seen in 97% with joint effusion
 - Abnormal: > 1 mm¹

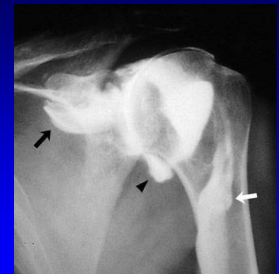


¹Zubler et al. Eur Radiol 2011; 21:1858

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Shoulder Joint Recesses

- Long head biceps tendon sheath
- Posterior recess:
 - Image with shoulder in external rotation
- Axillary recess
- Subscapular recess



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Biceps Tendon Sheath

- Intra-articular body
 - Echogenic
 - Possible shadowing
 - Single or multiple
 - Associated with glenohumeral joint osteoarthritis

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Biceps Tendon:

- Tenosynovitis
 - Unlike joint effusion:*
 - Focal distention
 - Hyperemia with color Doppler
 - Pain with transducer pressure
 - No effusion in posterior recess

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Biceps Tendon: tenosynovitis

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Biceps Tendon

- Tendinosis:
 - Hypoechoic
 - Swollen
 - No inflammatory cells (not tendinitis)
 - Possible tenosynovitis

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Biceps Tendon:

- Partial-thickness tear:
 - Hypoechoic /anechoic cleft
 - Tenosynovitis
 - Sensitivity: 27%
 - Accuracy: 88%
 - Subluxation / spur
 - Important secondary signs

Skendzel J, et al. AJR 2000; 197:942

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Aponeurotic Expansion of Supraspinatus Tendon

- Up to 49% of shoulders
- Cleft: coronal plane
- Origin: supraspinatus
- Distal: pectoralis or bicipital groove

Moser et al. Skeletal Rad 2015; 44:223

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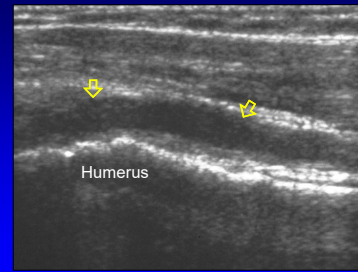
Biceps Tendon:

- Full-thickness tear:
 - Non-visualization proximally
 - Bicipital groove filled with fluid / granulation tissue
 - Distal retracted tendon stump
 - Ultrasound: 88% sensitivity, 97% accuracy

Skendzel J, et al. AJR 2000; 197:942

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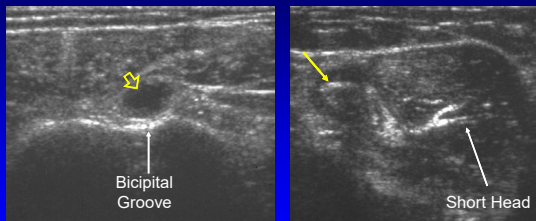
Biceps Tendon: full-thickness tear



Long Axis

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Biceps Tendon (long head): full-thickness tear

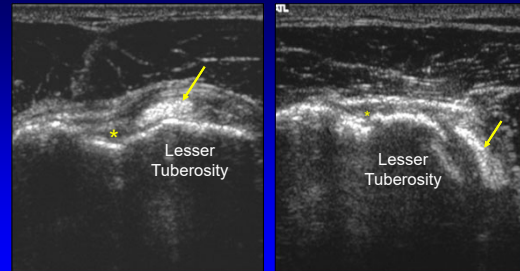


Short Axis: proximal

Short Axis: distal

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Biceps Tendon

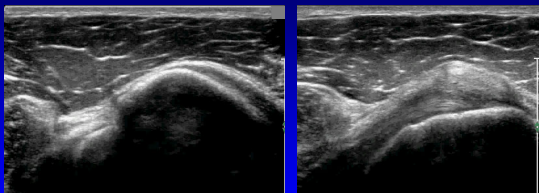


Subluxation

Dislocation

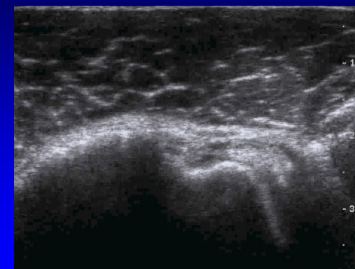
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Biceps Tendon Subluxation



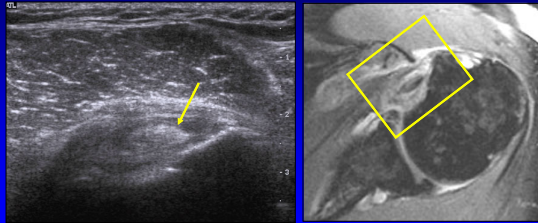
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Biceps Tendon Dislocation



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Biceps Tendon: Dislocation into subscapularis tendon



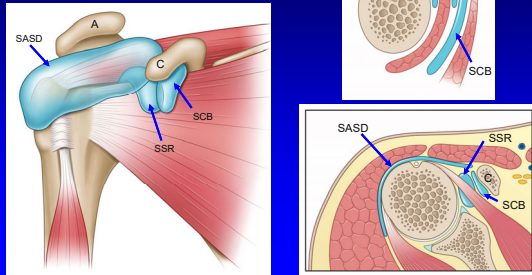
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Miscellaneous Pathology:

- Biceps brachii tendon
- Subacromial-subdeltoid bursa
- Acromioclavicular joint
- Labrum
- Greater tuberosity

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Subacromial-subdeltoid bursa (SASD) vs. subscapular recess (SSR) vs. subcoracoid bursa (SCB)



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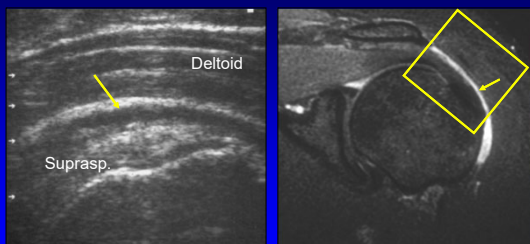
Subacromial-subdeltoid Bursa:

- Normal:
 - Thin hypoechoic layer: fluid, synovium
 - Hyperechoic: bursal walls and peribursal fat
- Abnormal: >1 mm thick*
 - Fluid: anechoic
 - Synovial tissue: hypoechoic

*Invest Radiol 1985;20:311

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Subacromial-subdeltoid Bursa: fluid

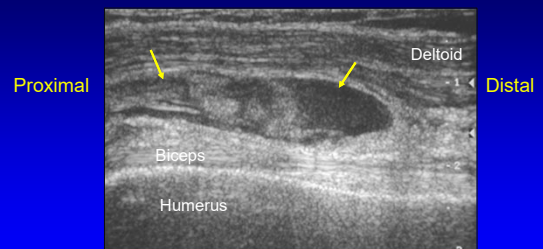


Coronal

Coronal T2w

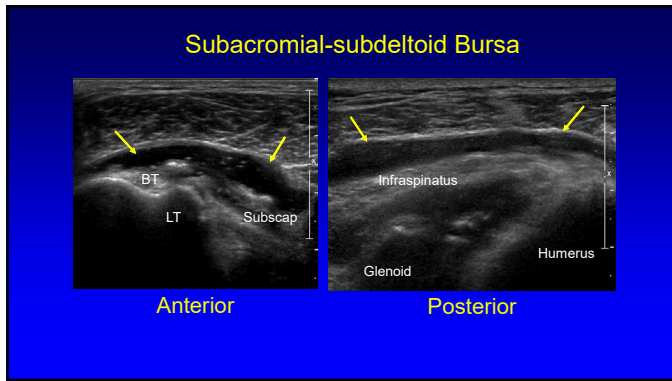
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Subacromial-subdeltoid bursa: anterior

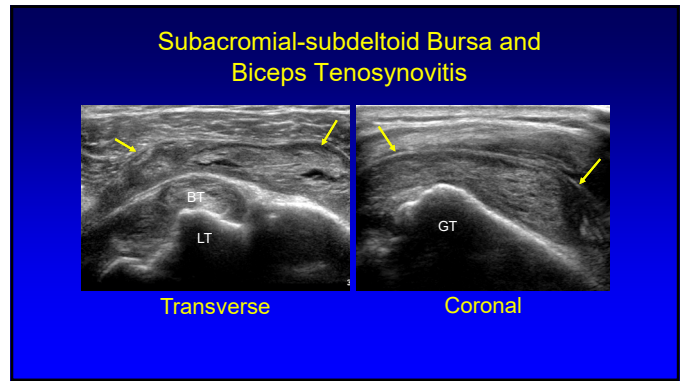


Sagittal

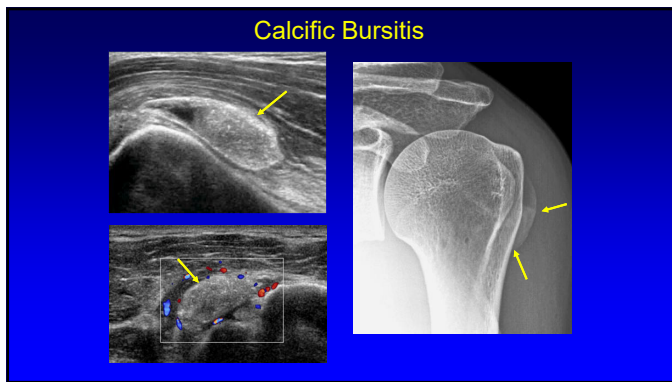
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Impingement Syndrome

- Cuff impingement
- Subacromial enthesophyte or acromioclavicular joint osteophyte
- Associated tendon degeneration and tear

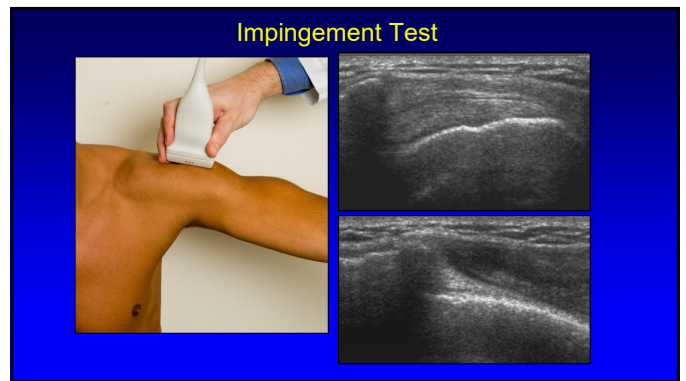
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Impingement: bursal fluid

- Abnormal pooling of subacromial-subdeltoid bursal fluid
- Lateral acromion¹:
 - Coronal plane, active arm elevation
 - Not visible in neutral position, no cuff tear
- Thickened tendon or bursa
 - Possible snapping of thickened bursa
 - “Gathering” of bursa: may be asymptomatic²

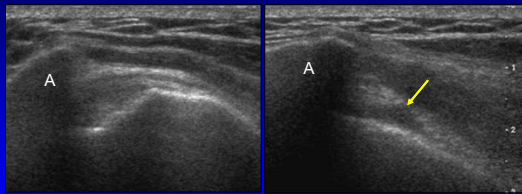
¹Farin et al. Radiology 1990; 176:845
²Daghir A et al. Skeletal Radiol 2012; 41:1047

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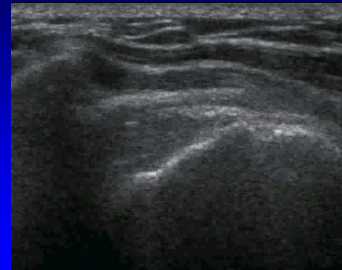
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Impingement Syndrome



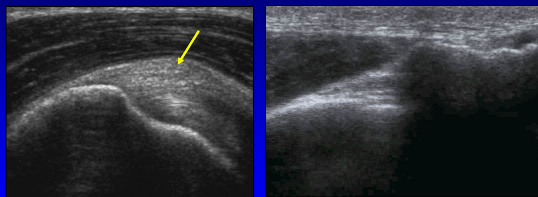
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Impingement: supraspinatus



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Impingement: supraspinatus



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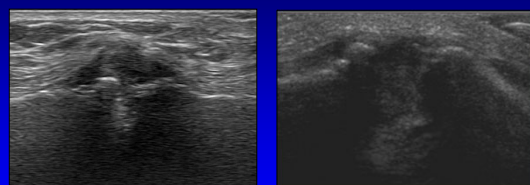
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Acromioclavicular Joint:

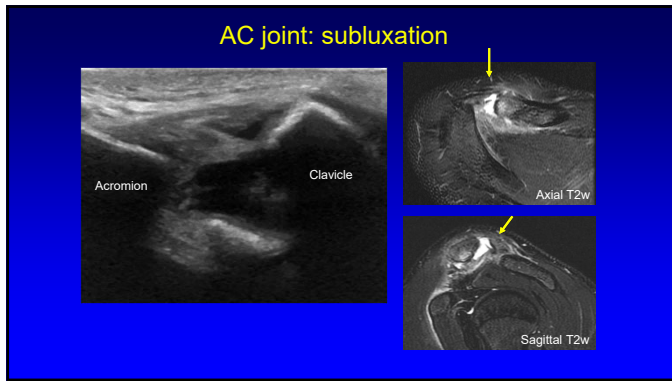
- Osteoarthritis: common by age 40
 - Thick capsule > 2 mm
 - Narrow, irregular, osteophytes
- Trauma:
 - Wide, possible subluxation
 - Thick capsule >2 mm
- Cyst versus geyser sign
 - Geyser: joint fluid tracking through ACJ via full-thickness rotator cuff tear

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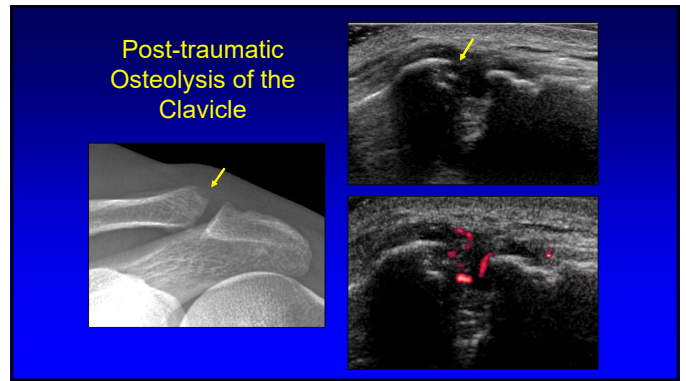
Acromioclavicular Joint



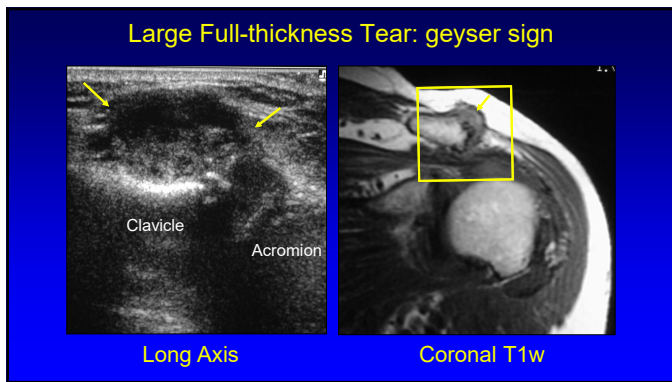
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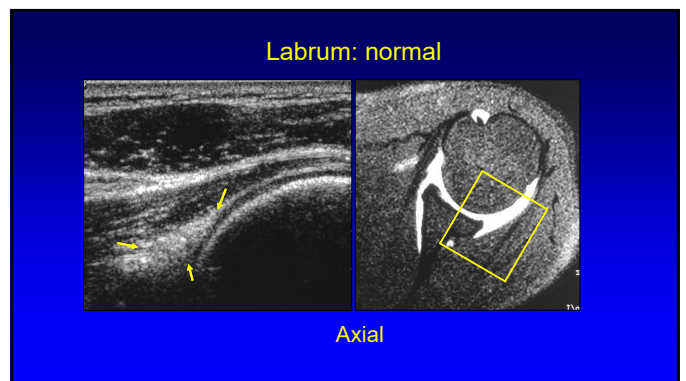
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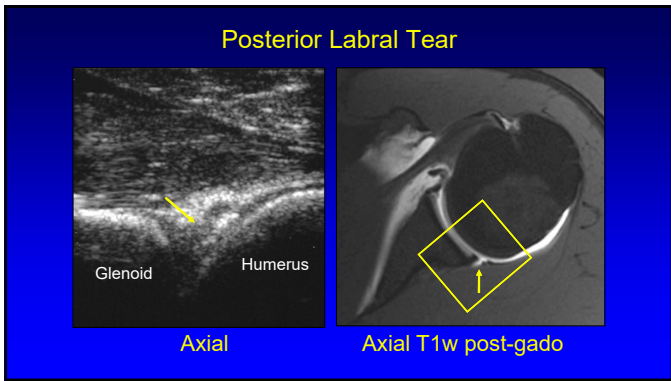
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- Glenoid Labrum:
- Hyperechoic
 - Some areas difficult to visualize
 - Hypoechoic cleft: tear
 - Diffuse hypoechoic: degeneration
 - Consider MRI to confirm

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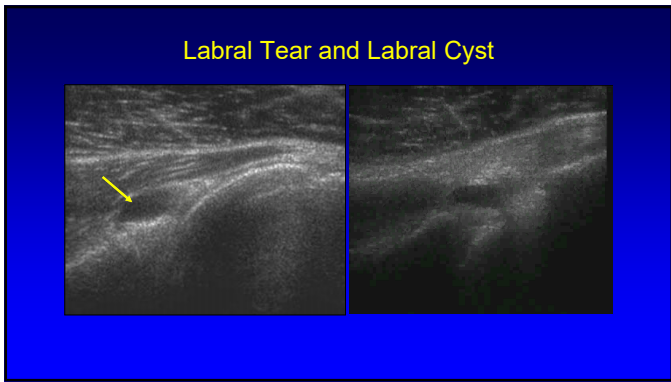
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Paralabral Cysts:

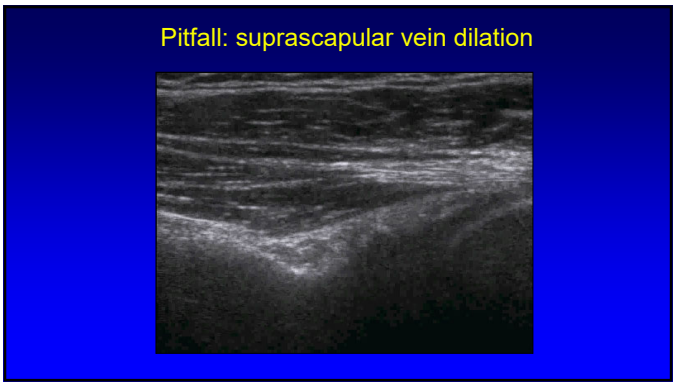
- Periarticular shoulder cyst
- May cause pain simulating rotator cuff tear
- Associated with labral tears

Tung et al. AJR 2000; 174:1707

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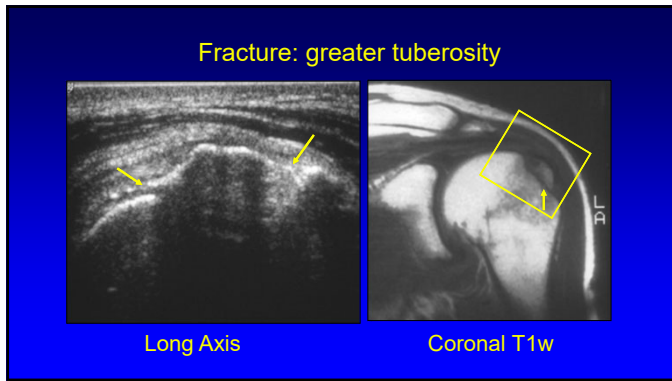
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Greater Tuberosity Fracture:

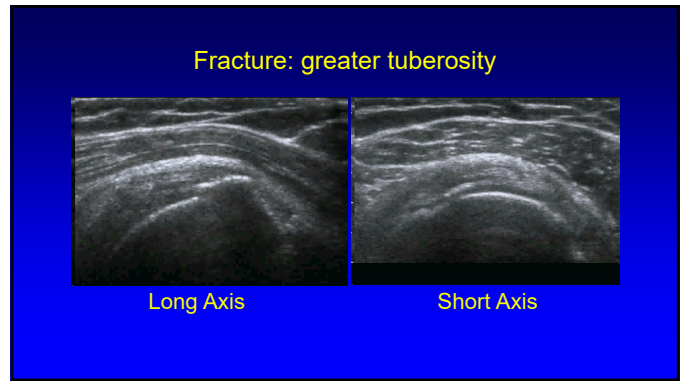
- Cortical step-off
- Point tenderness
- Differentiate from osteophyte
- Correlate with radiographs

Patten et al. Radiology 1992; 182:201

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- ### Take-home Points
- Biceps brachii:
 - Don't overcall tenosynovitis
 - Dynamic evaluation
 - Subacromial-subdeltoid bursa:
 - Covers SST, IST, subscapularis, BT
 - ACJ: cyst versus geyser
 - Labrum: suprascapular vein pitfall
 - Greater tuberosity: fracture

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Thank you!





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Syllabus on line and other educational material:
www.jacobsonmskus.com



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