Basic Shoulder Ultrasound

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Shoulder Ultrasound

- Anatomy
- Scanning protocol
- Ultrasound evaluation
- Common pathologies

Shoulder Ultrasound

- Acromioclavicular joint
- Bicipital groove and long head of the biceps tendon
- Subscapularis tendon
- Supraspinatus tendon
- Infraspinatus tendon

*Glenohumeral joint and Spinoglenoid notch

*Rotator cuff interval

Shoulder Ultrasound

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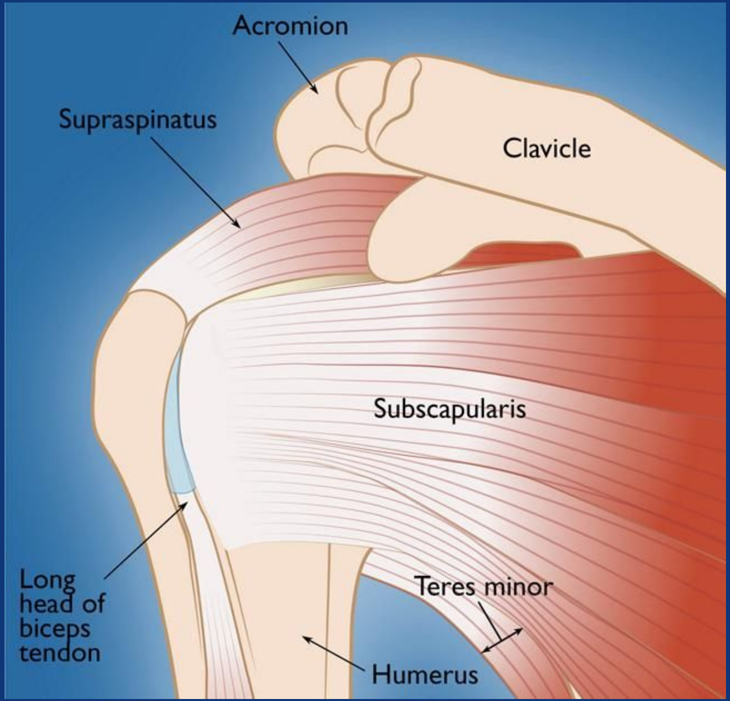
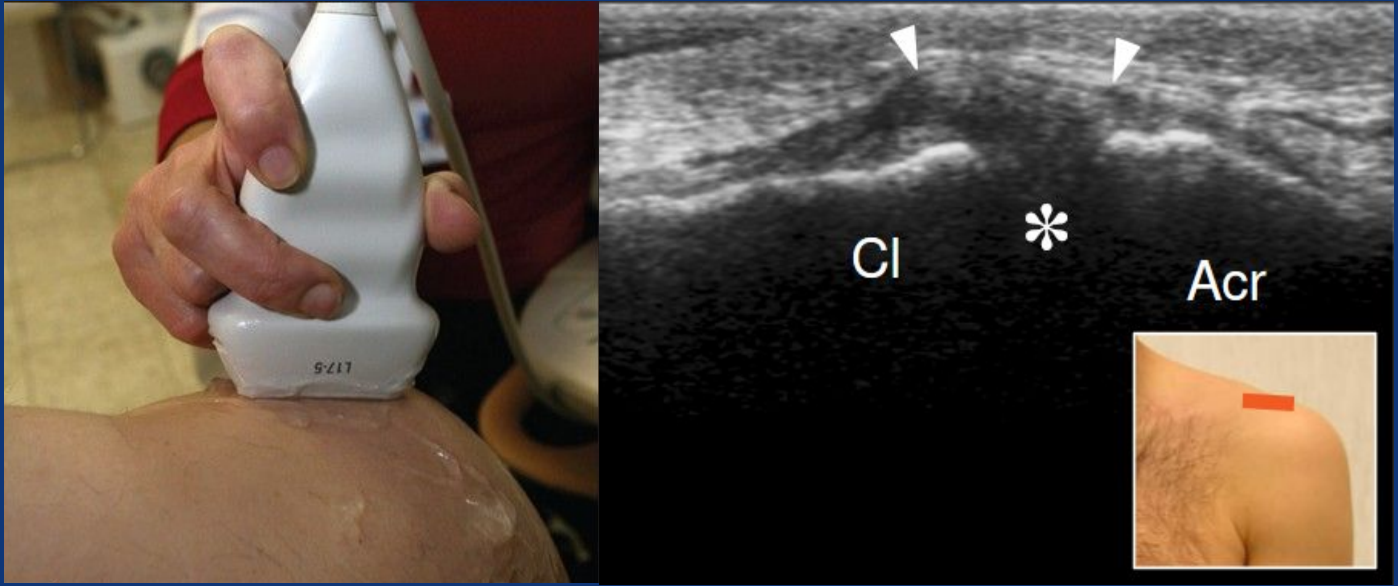
Shoulder Ultrasound

- Acromioclavicular joint
  - Synovial joint
  - Lateral end of the clavicle
  - Acromion process of the scapula



Shoulder Ultrasound

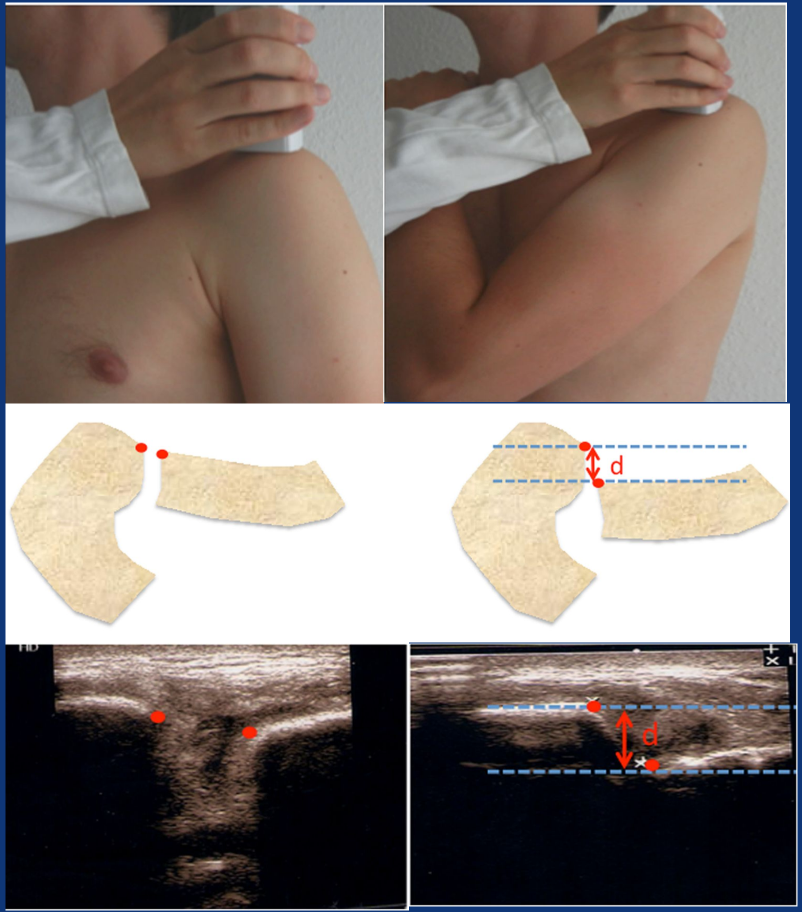
- Acromioclavicular joint
  - Palpate the clavicle and place the just lateral to it in transverse position
  - Pain and/or tenderness on top of the shoulder or when reaching on the contralateral side



(Acr) Acromion; (Cl) Distal head of clavicle; (Arrows) Capsule; (*) Fibrocartilage disc

Shoulder Ultrasound

- Acromioclavicular joint
    - Bone irregularities, narrowing, widening or offset
    - Dynamic assessment
        - Patient places hand to the opposite shoulder
        - Joint may widen, offset or cause bone-on-bone contact



Shoulder Ultrasound

- Acromioclavicular joint
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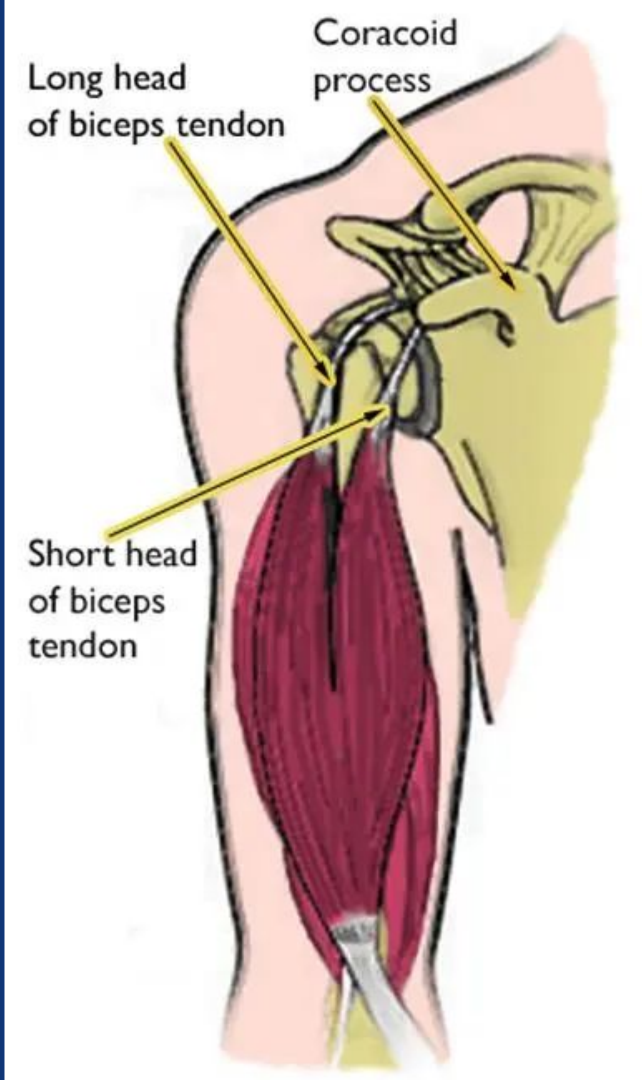
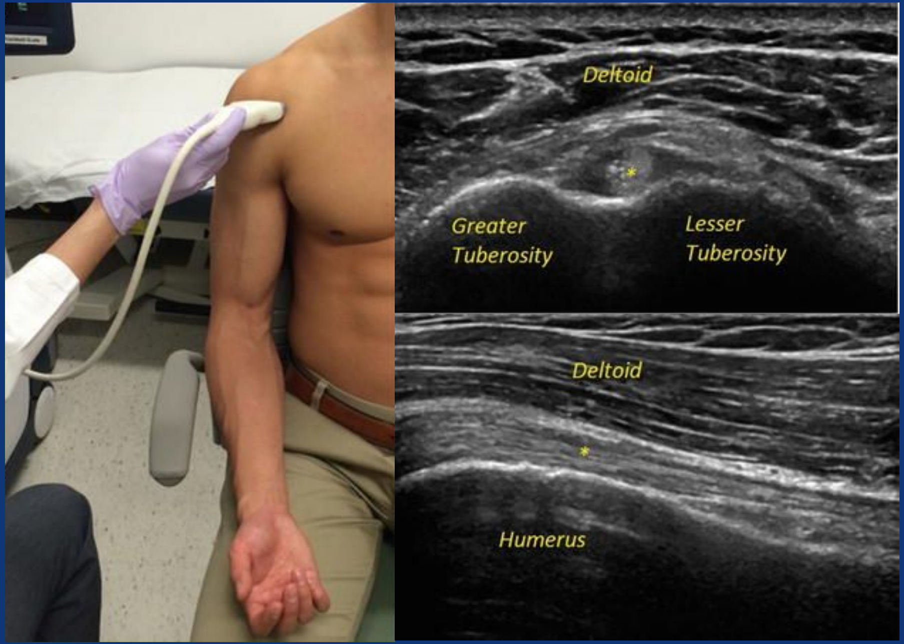
Shoulder Ultrasound

- Long head of the biceps tendon
  - Supraglenoid tubercle and Superior glenoid labrum of the scapula
  - Bicipital groove
  - + short head = biceps muscle



Shoulder Ultrasound

- Long head of the biceps tendon
  - Neutral position with hand palm up on the lap
  - Probe on anterior shoulder in transverse
  - Locate the bicipital groove
  - Rotate the probe to sagittal orientation
  - Pain/tenderness/weakness in front of shoulder or when flexing the arm
  - Pain when turning the arm



Shoulder Ultrasound

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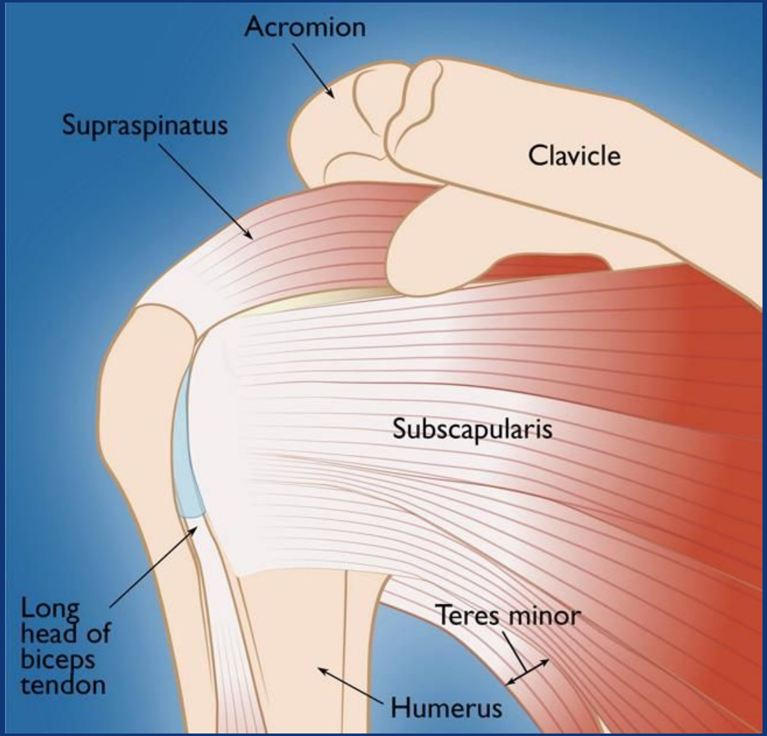
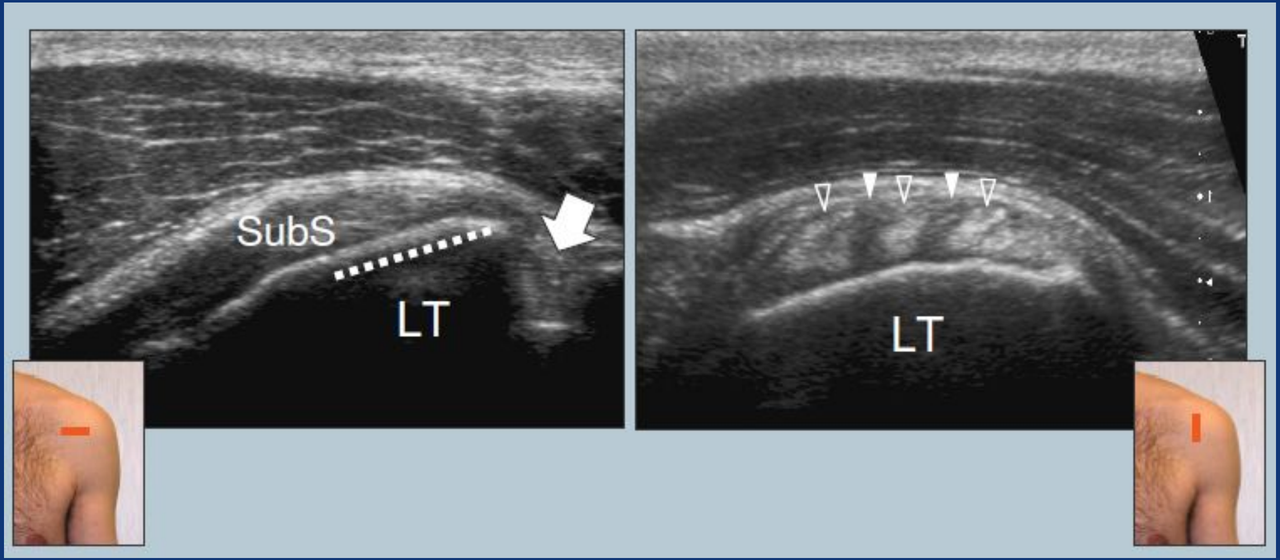
Shoulder Ultrasound

- Subscapularis tendon
  - Origin: subscapular fossa
  - Insertion: lesser tubercle of the humerus
  - Internal rotation and adduction of the humerus
  - Pain in front of the shoulder, weakness in internal rotation, and difficulty in activities that involve overhead movements and reaching



Shoulder Ultrasound

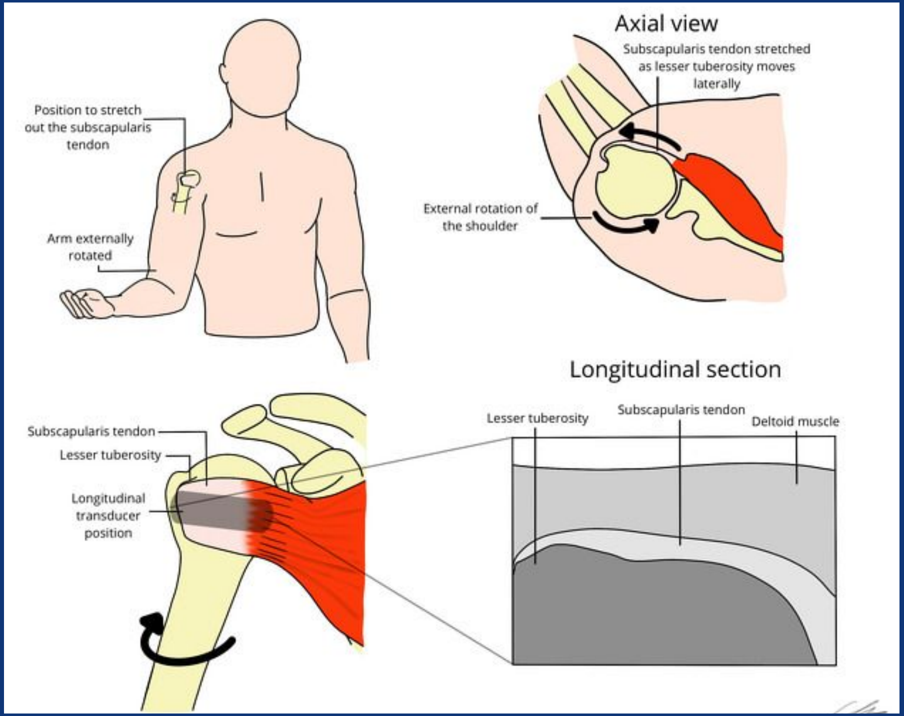
- Subscapularis tendon
  - Neutral position with probe placed over the anterior shoulder visualizing the bicipital groove
  - Center to the lesser tuberosity/medial aspect of the bicipital groove then externally rotate the shoulder

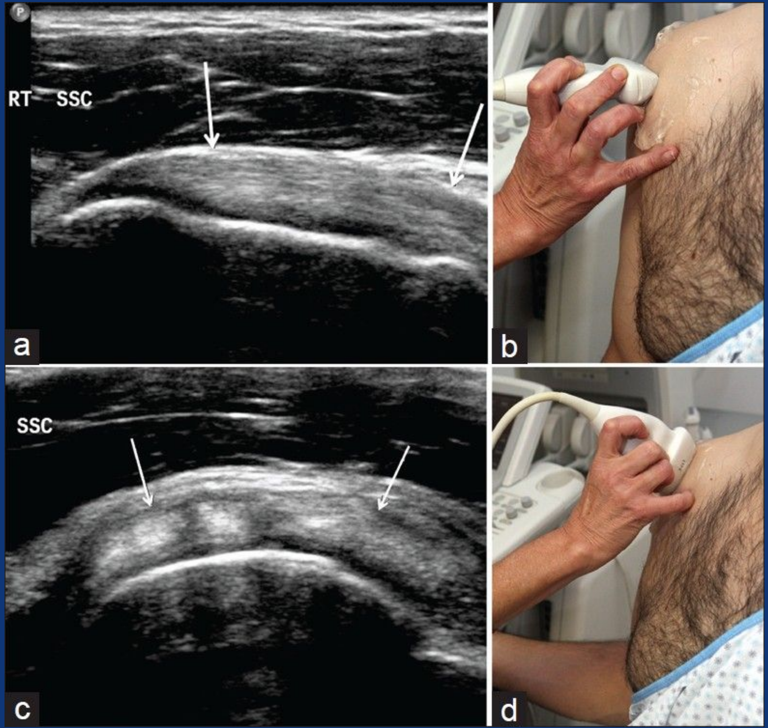


(SubS) Subscapularis tendon; (LT) Lesser tuberosity; (Arrow heads) Subscapularis muscle belly

Shoulder Ultrasound

- Subscapularis tendon





Shoulder Ultrasound

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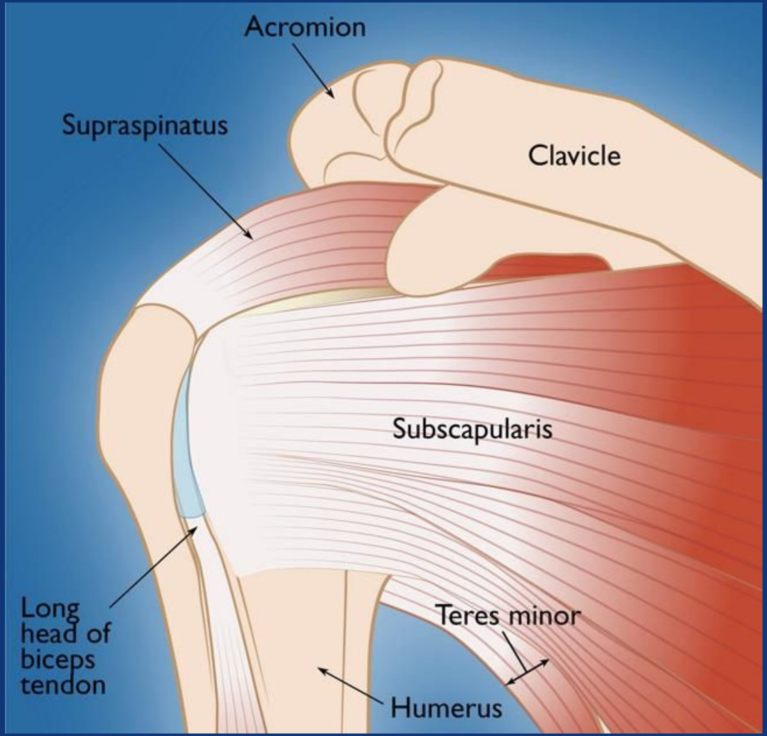
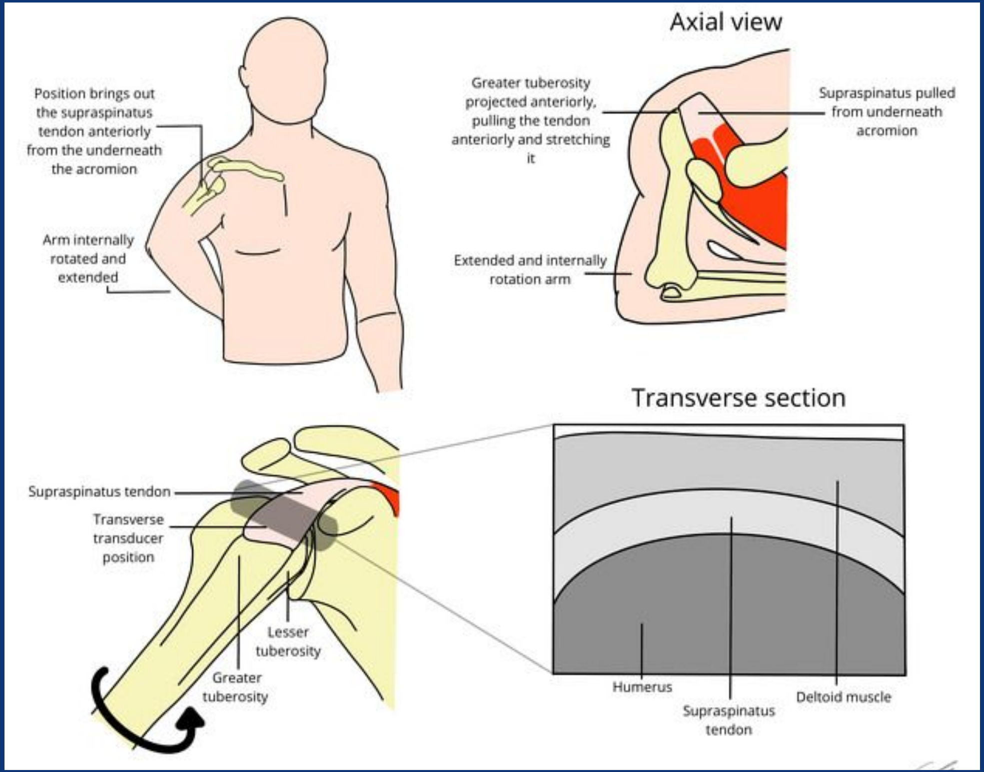
Shoulder Ultrasound

- Supraspinatus tendon
  - Origin: Supraspinous fossa
  - Insertion: Greater tubercle of the humerus
  - Abduction of the humerus and shoulder stability
  - Pain and/or weakness on abduction or external rotation. Pain when lifting or reaching overhead



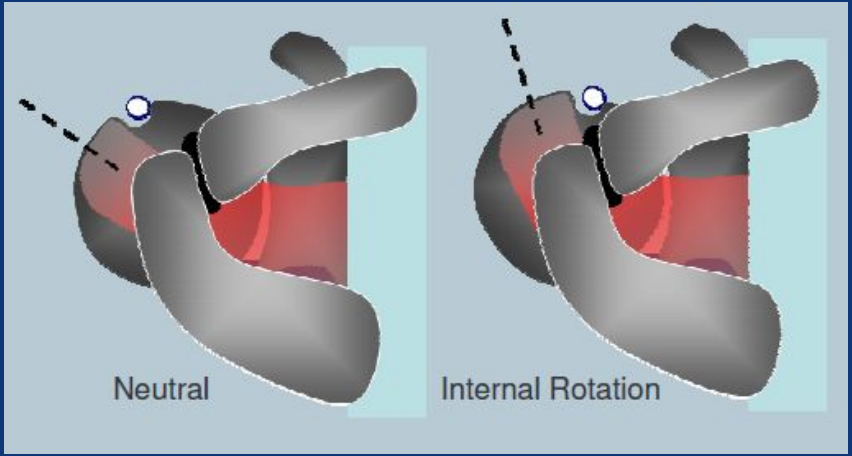
Shoulder Ultrasound

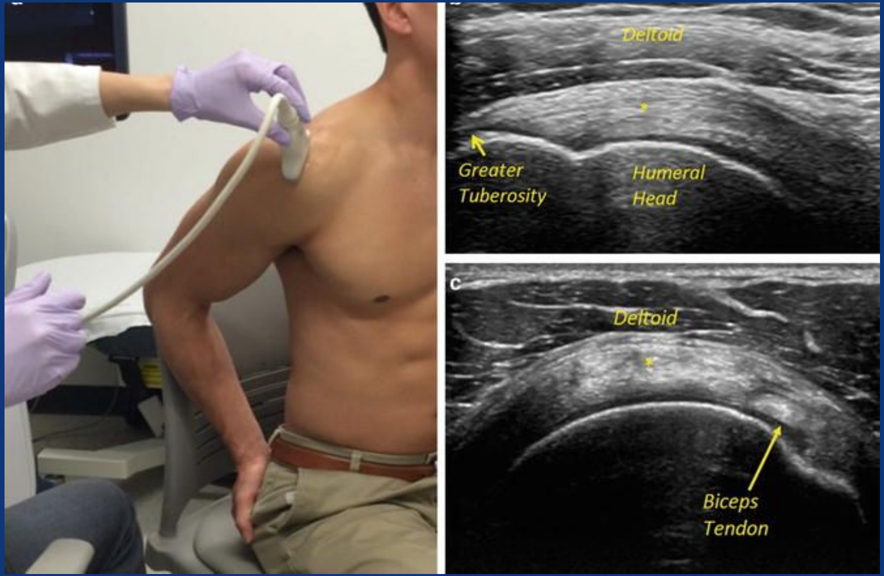
- Supraspinatus tendon
  - Patient places hand posteriorly to internally rotate and extend the shoulder, as if reaching for the back pocket
  - Probe is placed directly on the humeral head



Shoulder Ultrasound

- Supraspinatus tendon
  - Convex beak-like shape
  - Rotator interval
  - Subacromial-subdeltoid bursa



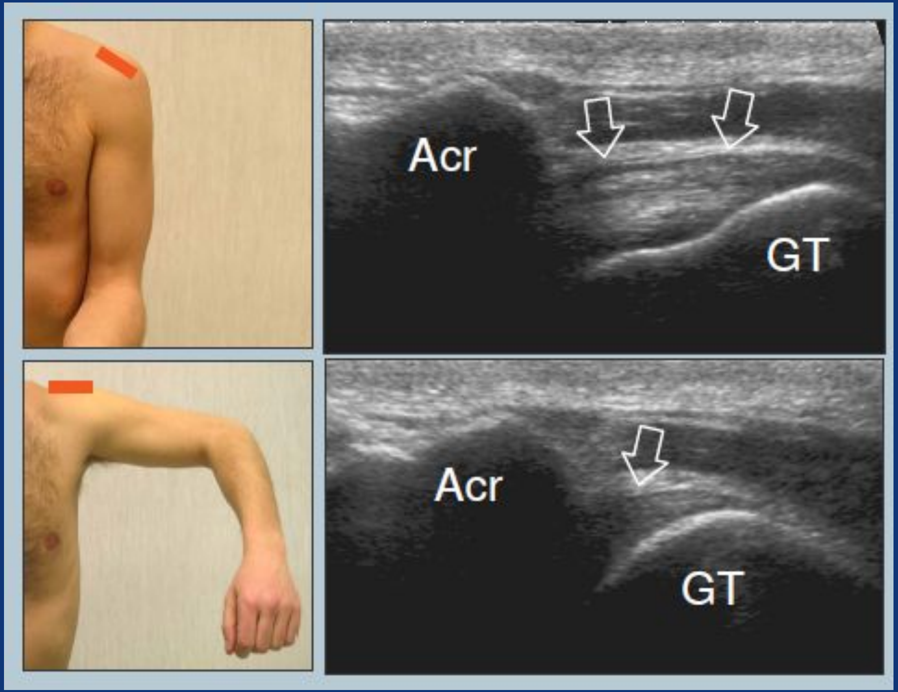


Shoulder Ultrasound

- Supraspinatus tendon

Shoulder Ultrasound

- Dynamic examination for impingement



(Acr) Acromion; (GT) Greater tubercle; (Arrows) Supraspinatus tendon

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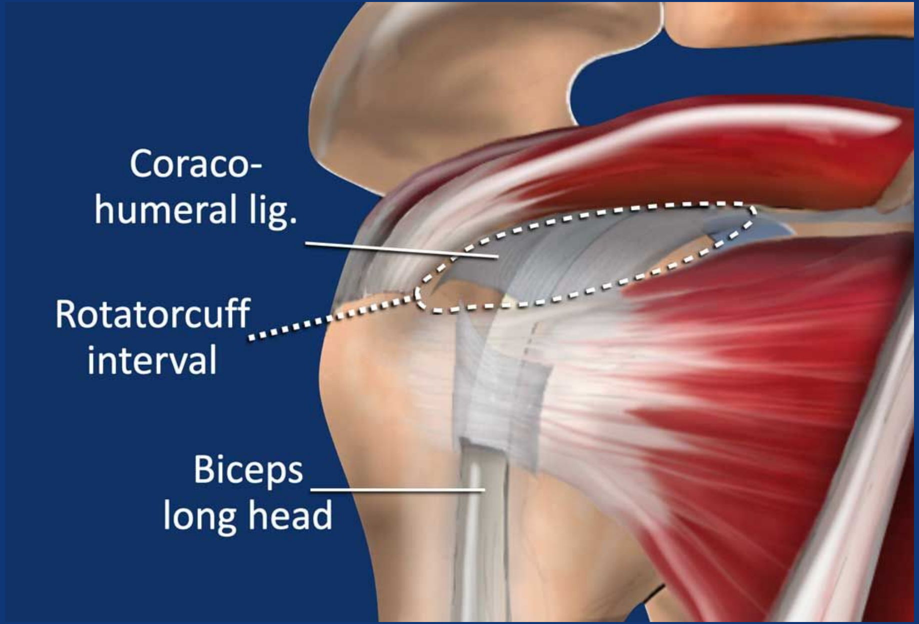
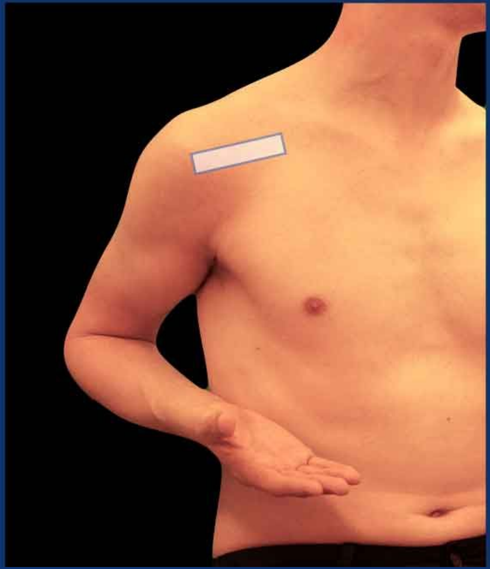
Shoulder Ultrasound

- Rotator Interval
  - Space between subscapularis, supraspinatus tendons and base of the coracoid process
  - Contains LHB tendon and superior glenohumeral ligament
  - Adhesive capsulitis



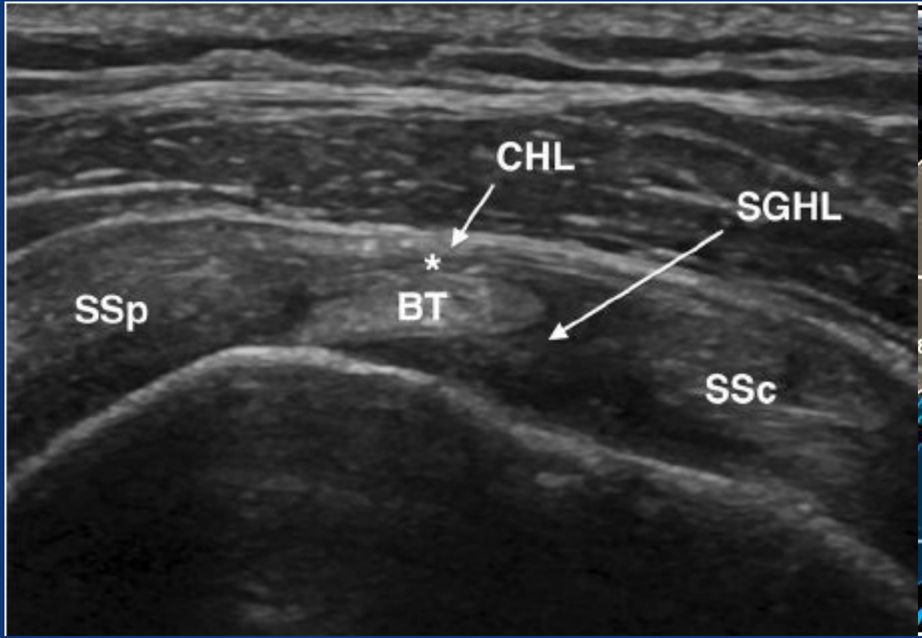
Shoulder Ultrasound

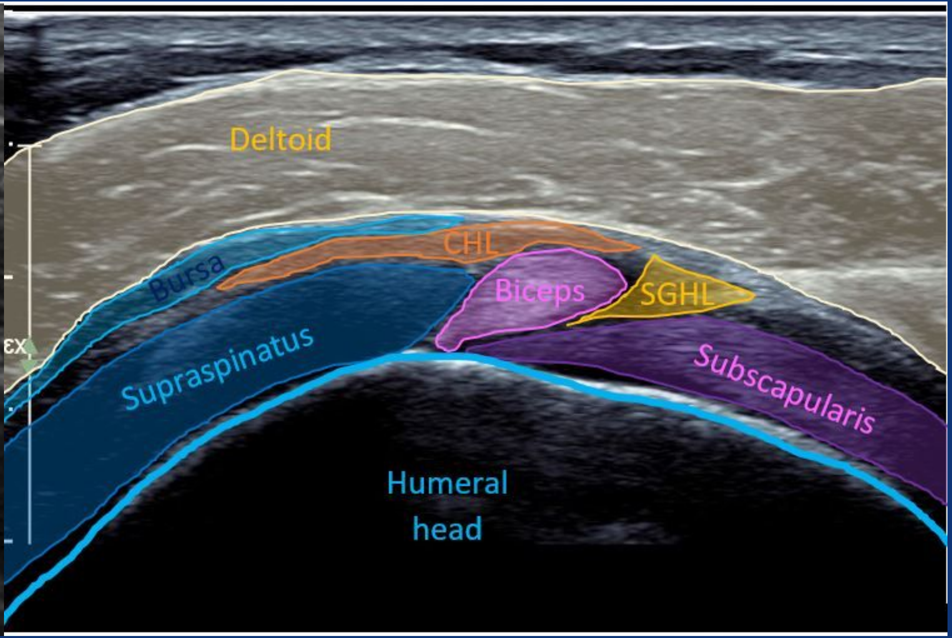
- Rotator Interval
  - Internally rotate and extend the shoulder
  - Probe is placed directly on the humeral head



Shoulder Ultrasound

- Rotator Interval





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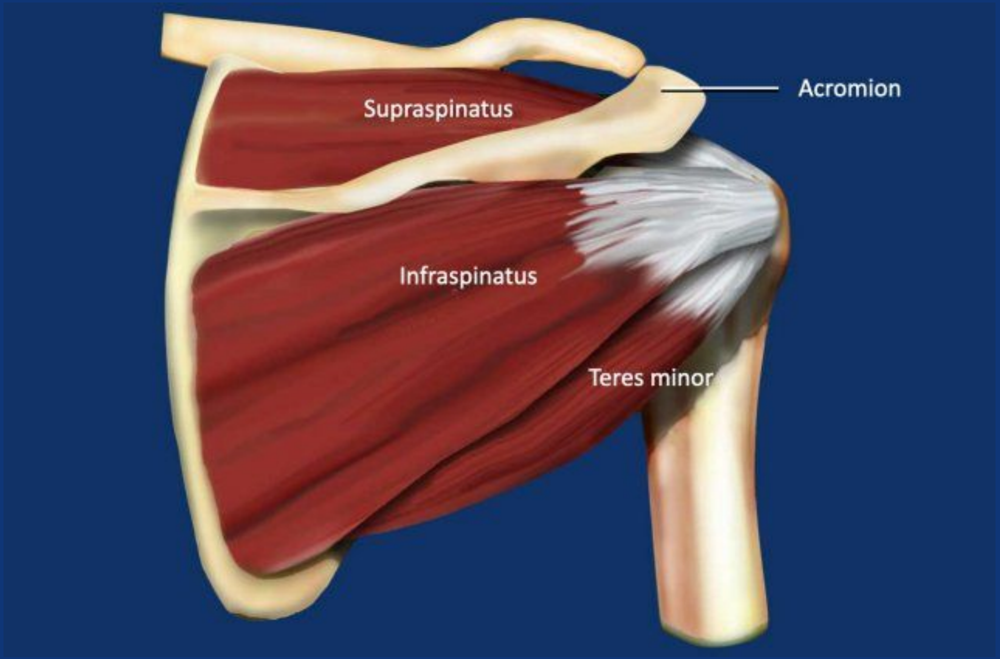
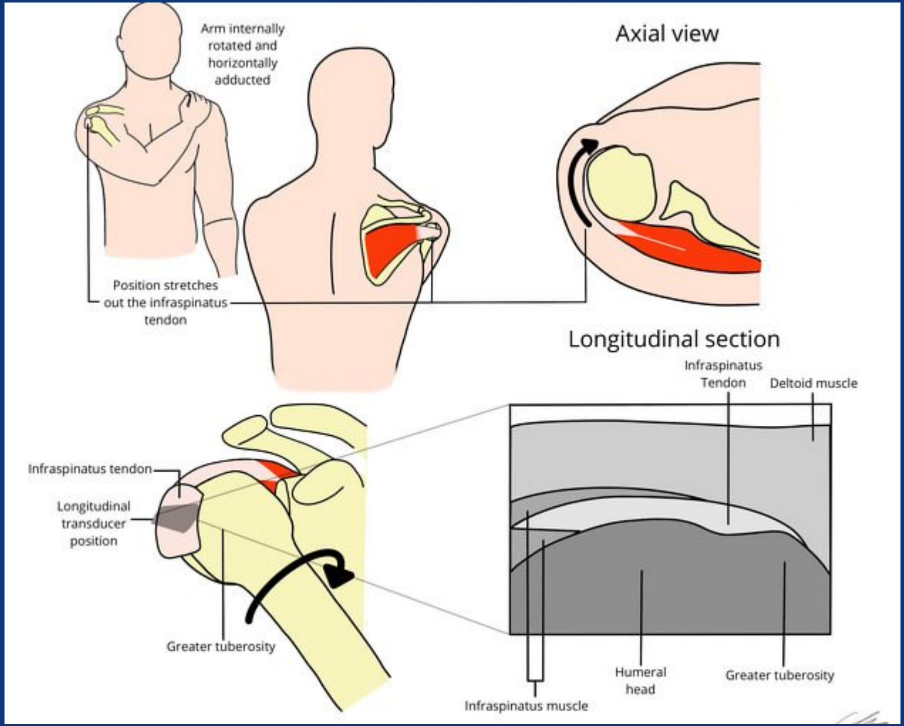
Shoulder Ultrasound

- Infraspinatus tendon
  - Origin: Infraspinous fossa
  - Insertion: Middle facet of the greater tubercle of the humerus
  - External rotation
  - Pain on arm rotation, lifting, when sleeping in the affected side



Shoulder Ultrasound

- Infraspinatus tendon
  - Neutral position
  - Patient can also be positioned with the ipsilateral hand placed on the contralateral shoulder
  - Probe is placed obliquely parallel and just below the scapular spine in the posterior shoulder



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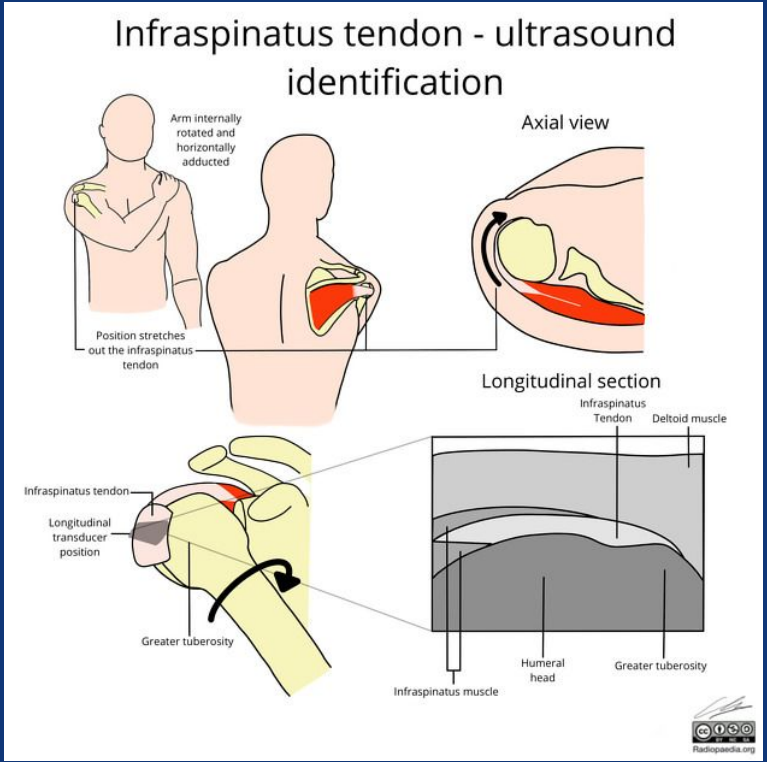
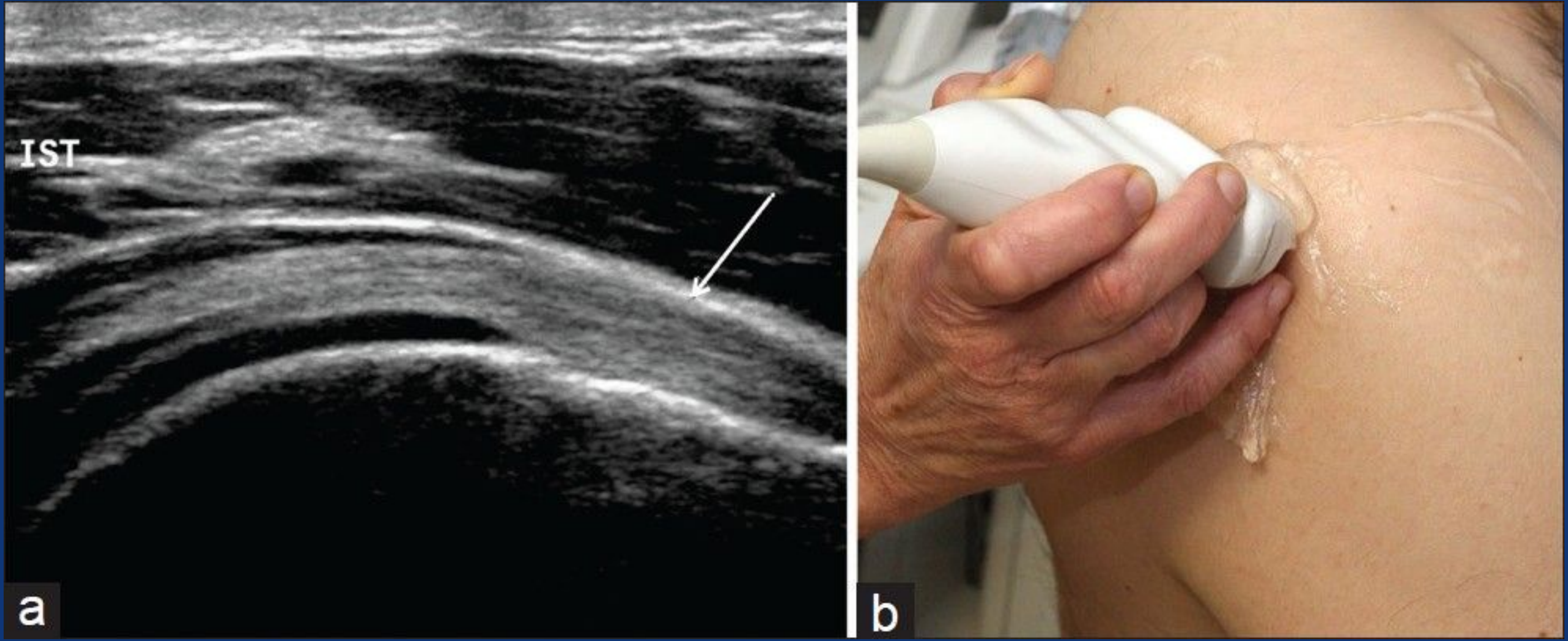


Shoulder Ultrasound

- Infraspinatus tendon



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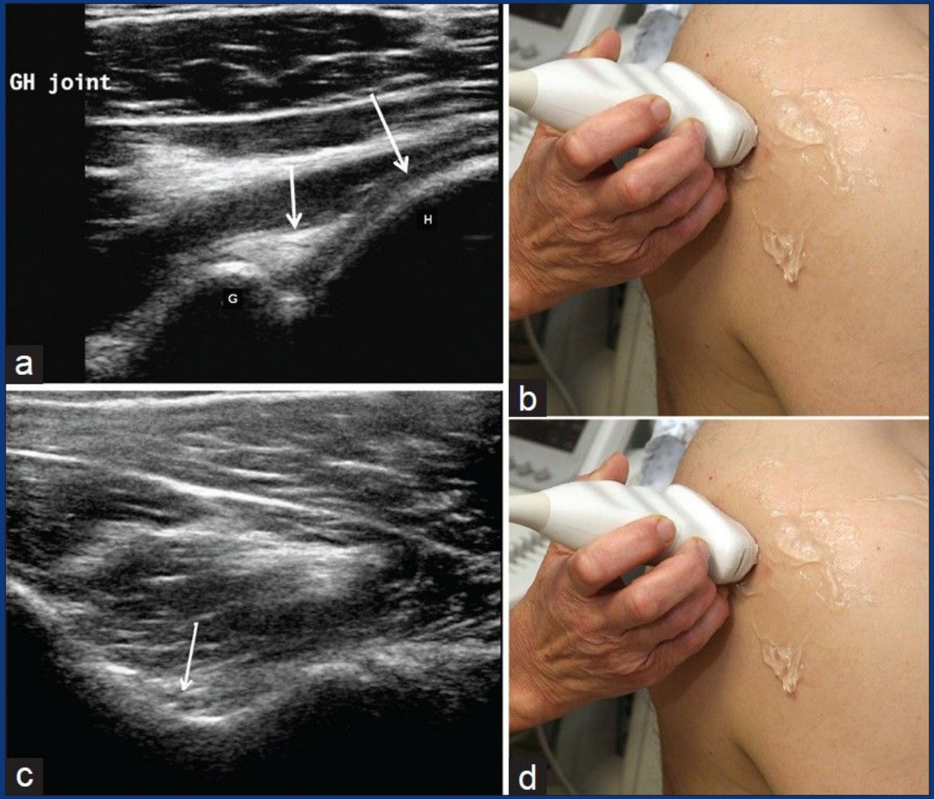
Shoulder Ultrasound

- Glenohumeral joint
  - Labrum
  - Hill-Sachs defect
  - Labral tear
  - Effusion

- Spinoglenoid notch
  - Connection between the supraspinatus and infraspinatus fossae
  - Suprascapular nerve and artery
  - Ganglion cysts

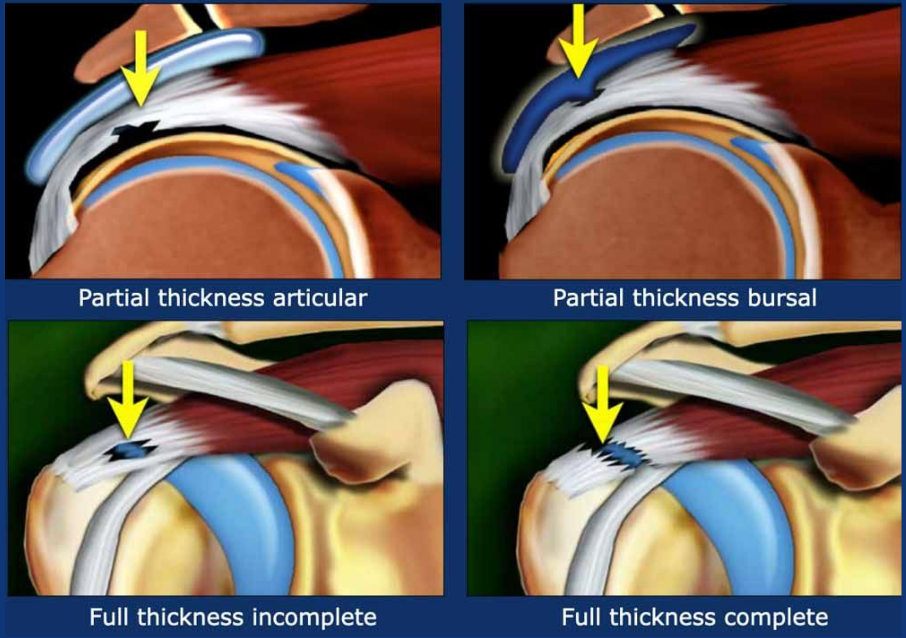


Shoulder Ultrasound

Common pathologies

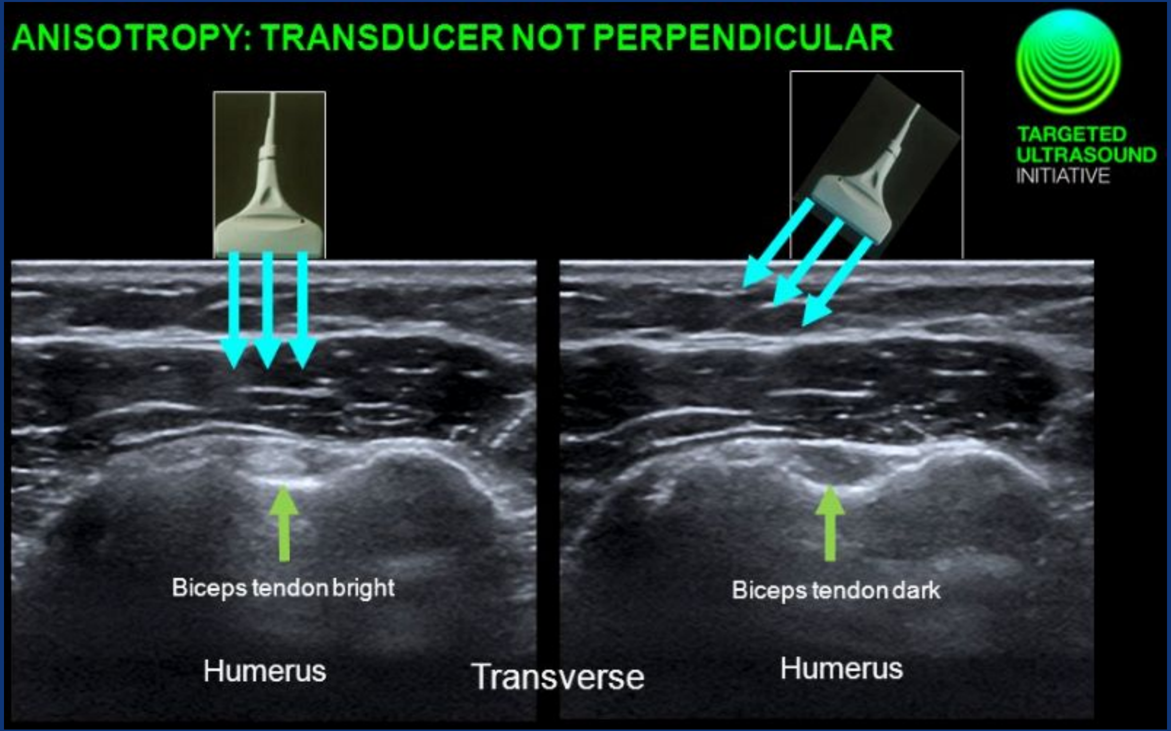
Shoulder Ultrasound

- Pathologies
  - Tenosynovitis
    - Overuse injury
    - Fluid in the surrounding synovial sheath
  - Tendinopathy
    - Overuse, impingement, age related changes
    - Initial - thickening
    - Progression - loss of fibrillar pattern replaced by hypoechoic changes
  - Tears
    - Partial thickness - only part of the tendon, articular or bursal surface
    - Full thickness - complete or incomplete



Shoulder Ultrasound

- Anisotropy



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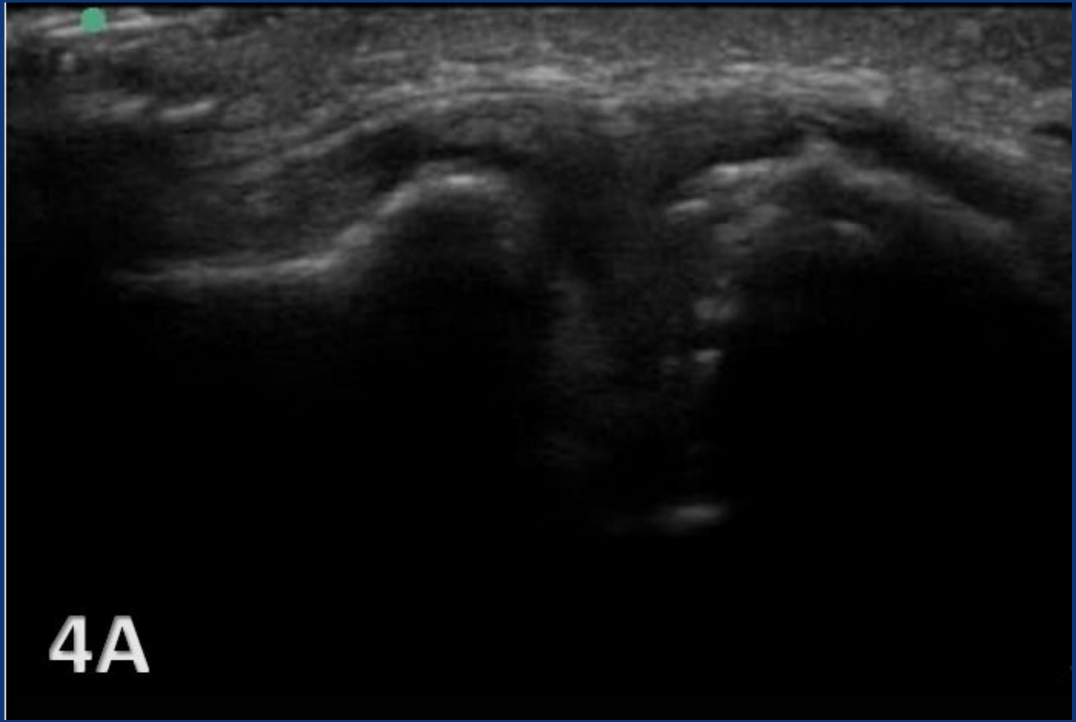

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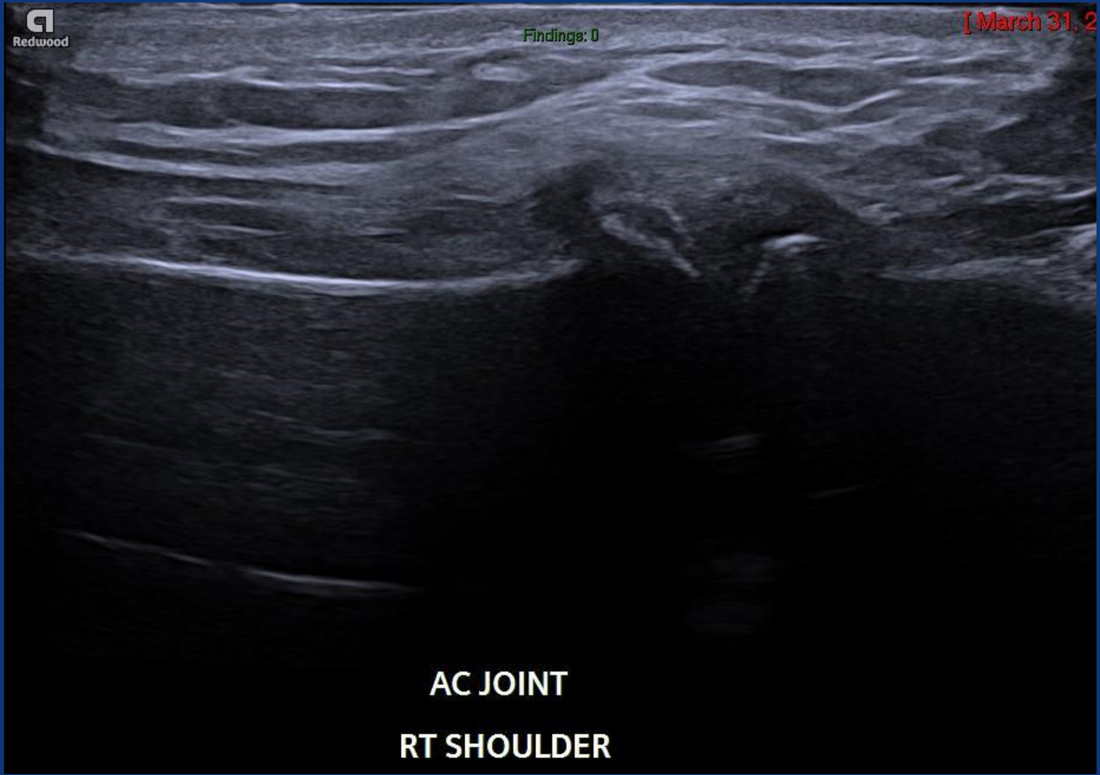
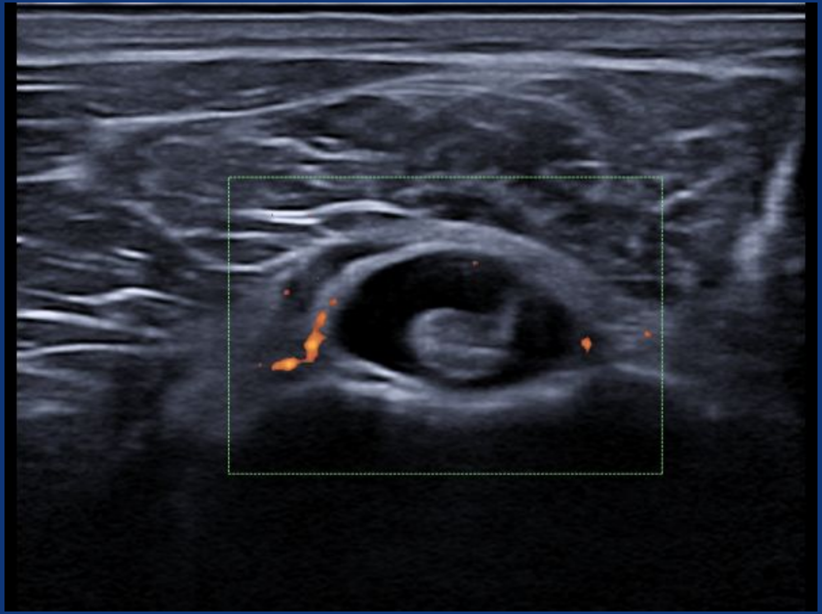
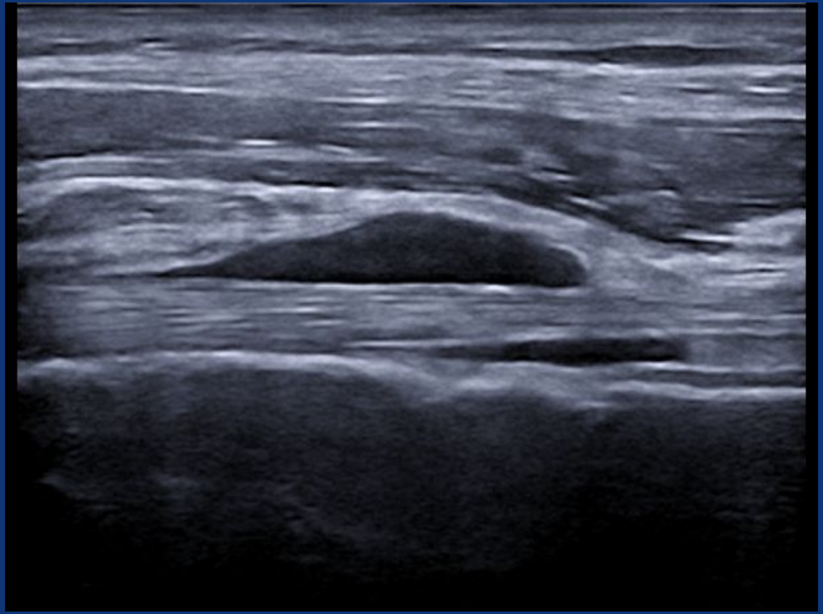


Shoulder Ultrasound

- Long head of the biceps tendon





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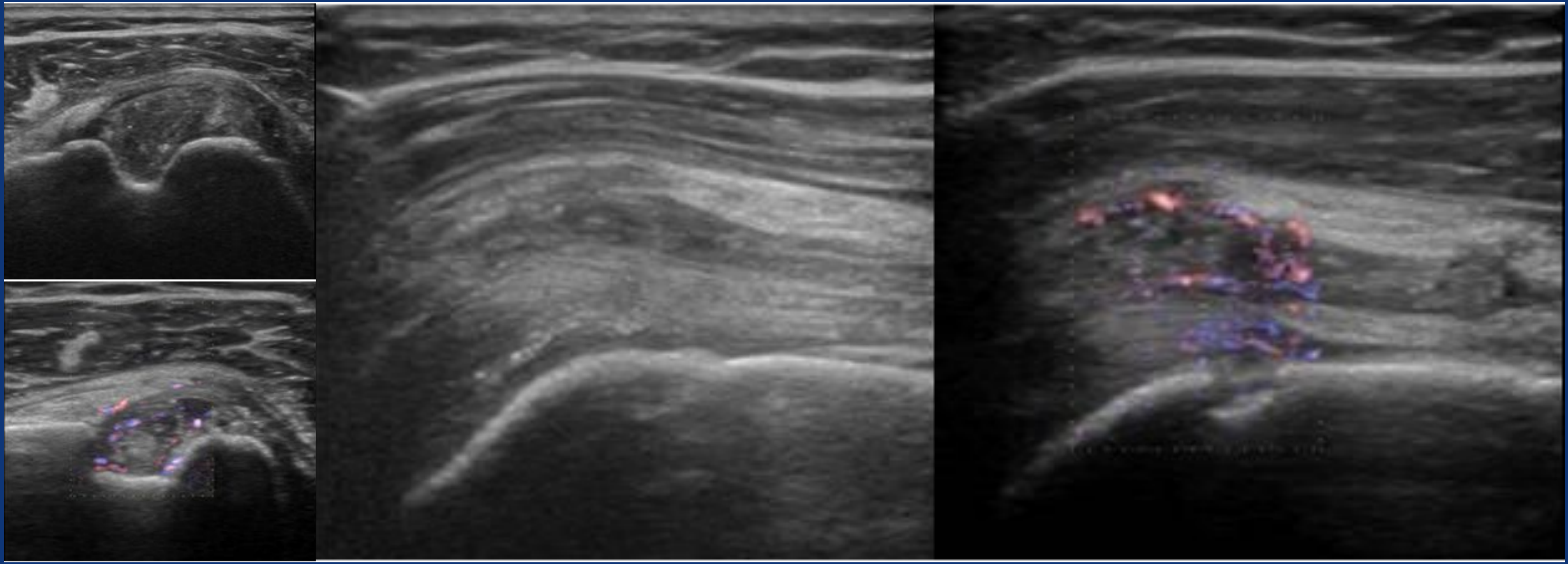

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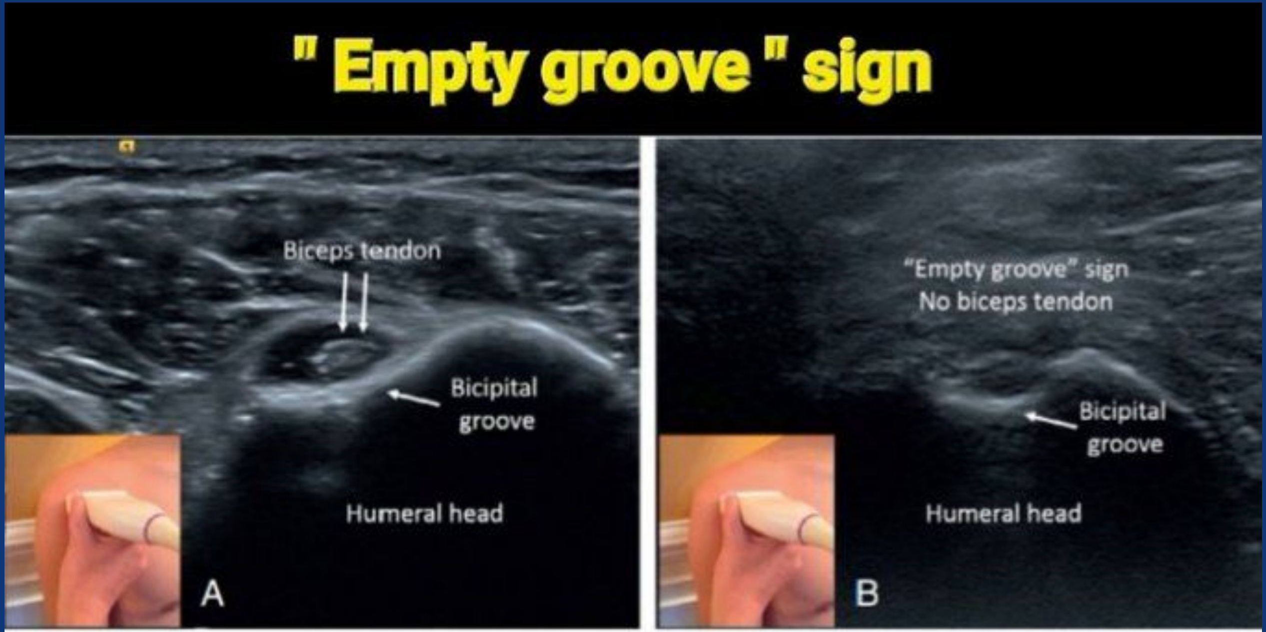
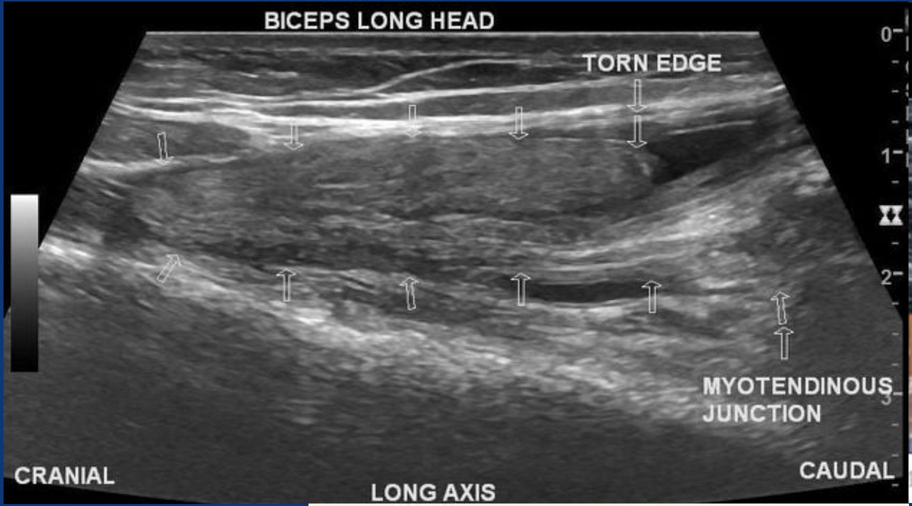
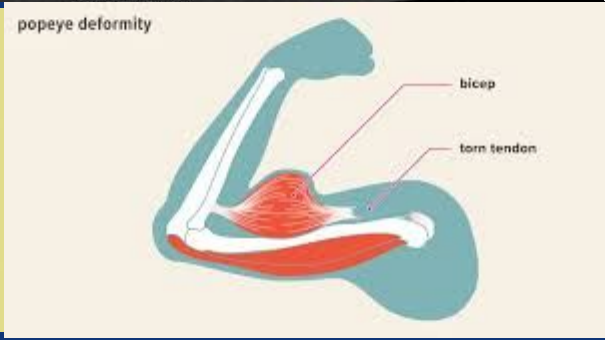


Essential Orthopaedics,2nd Edition 2020,Mark D. Miller, MD et al .

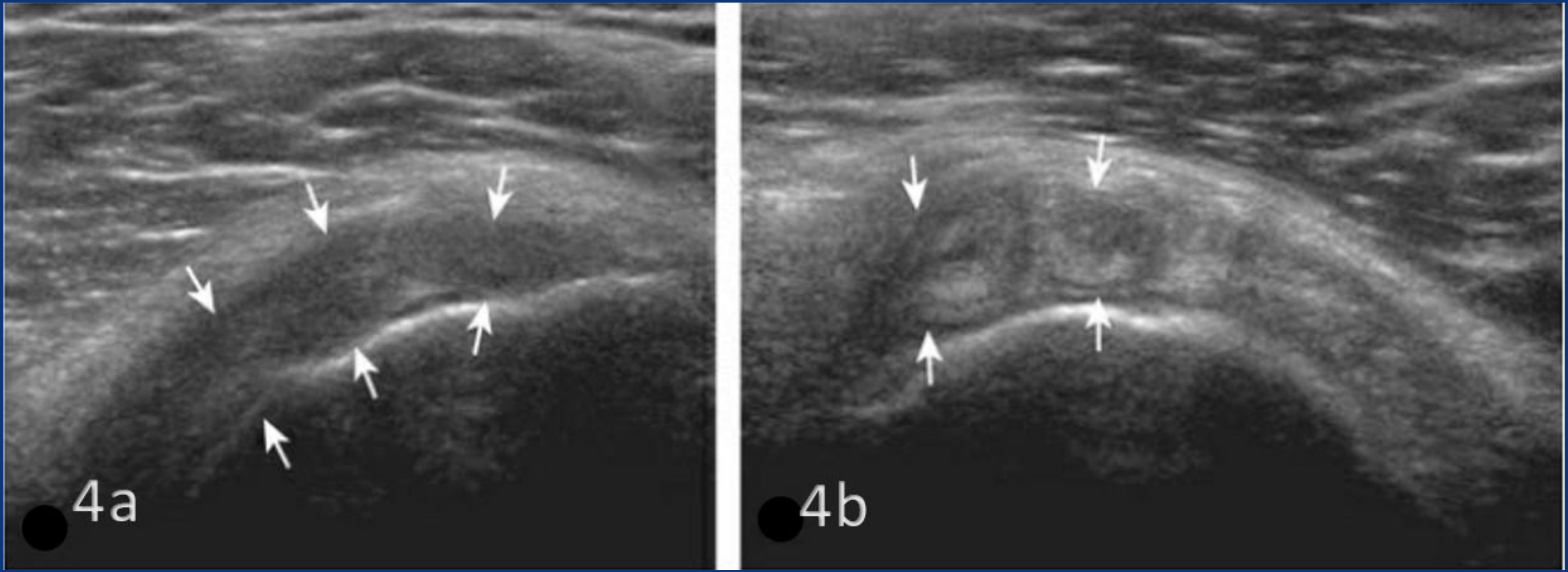
Shoulder Ultrasound





Shoulder Ultrasound

- Subscapularis tendon



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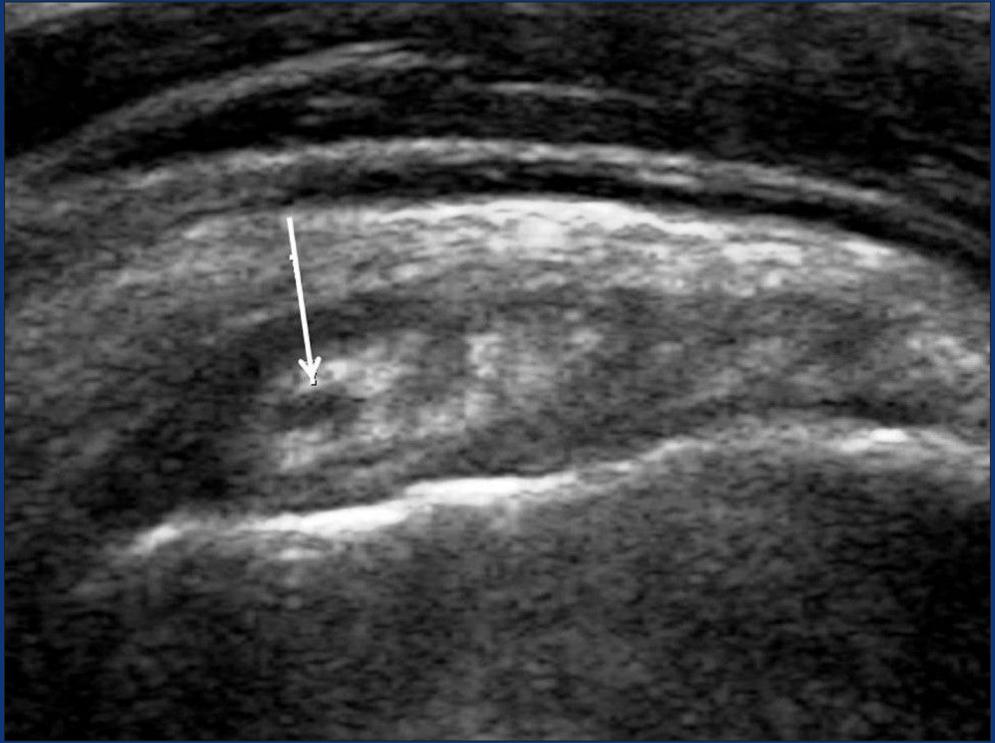

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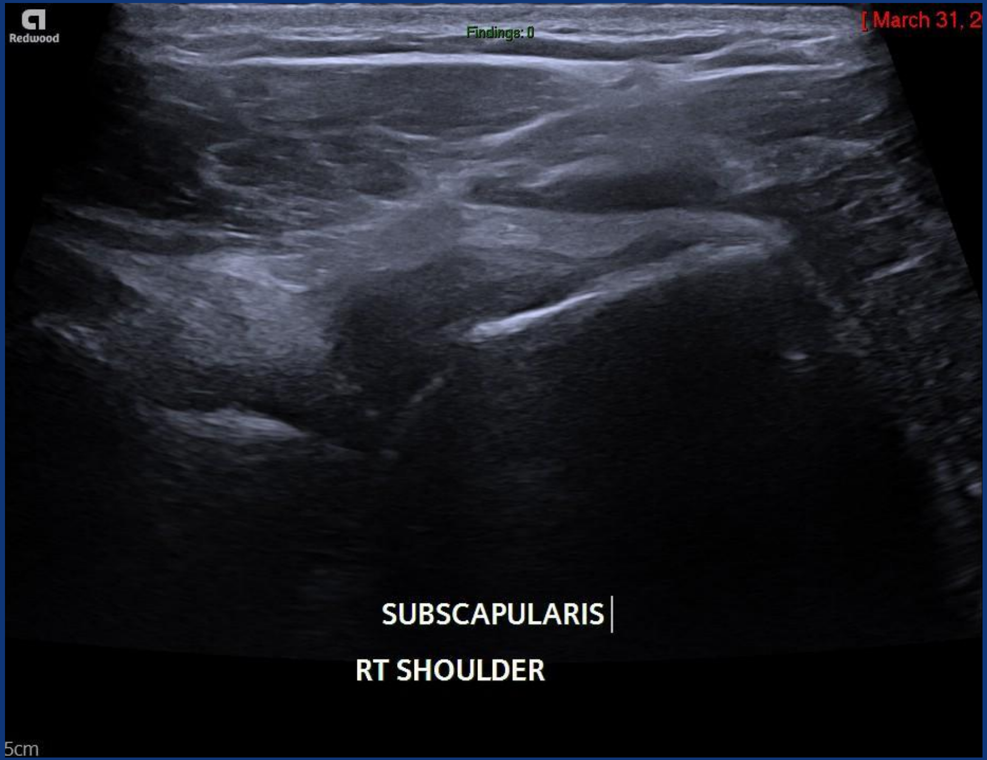
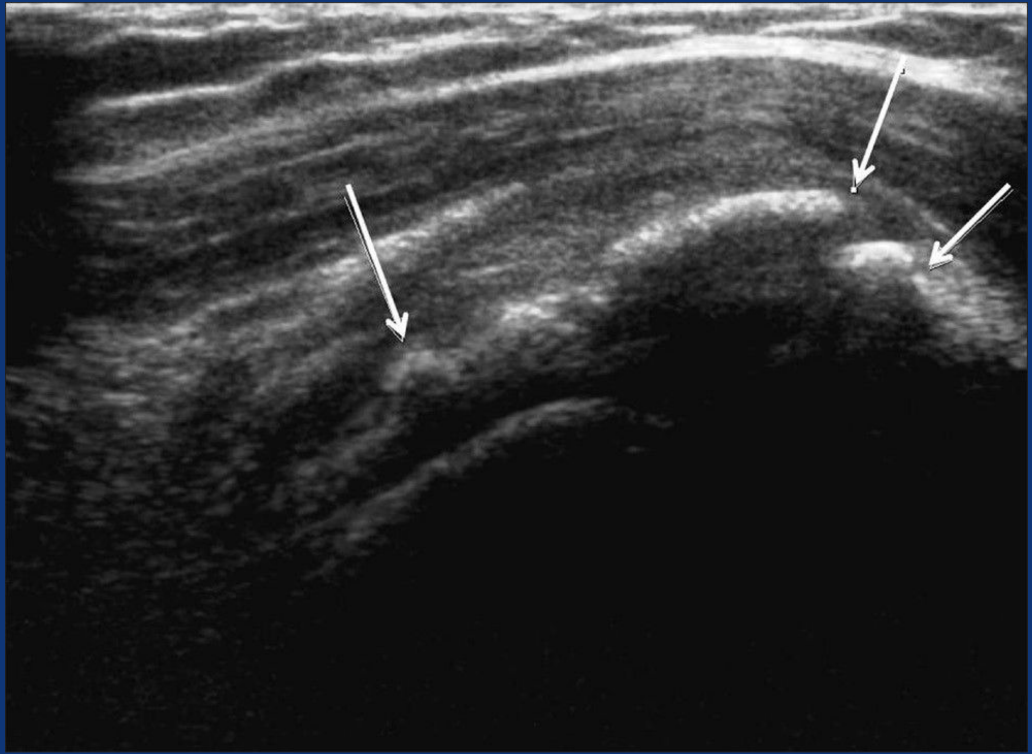


Shoulder Ultrasound

- Supraspinatus tendon

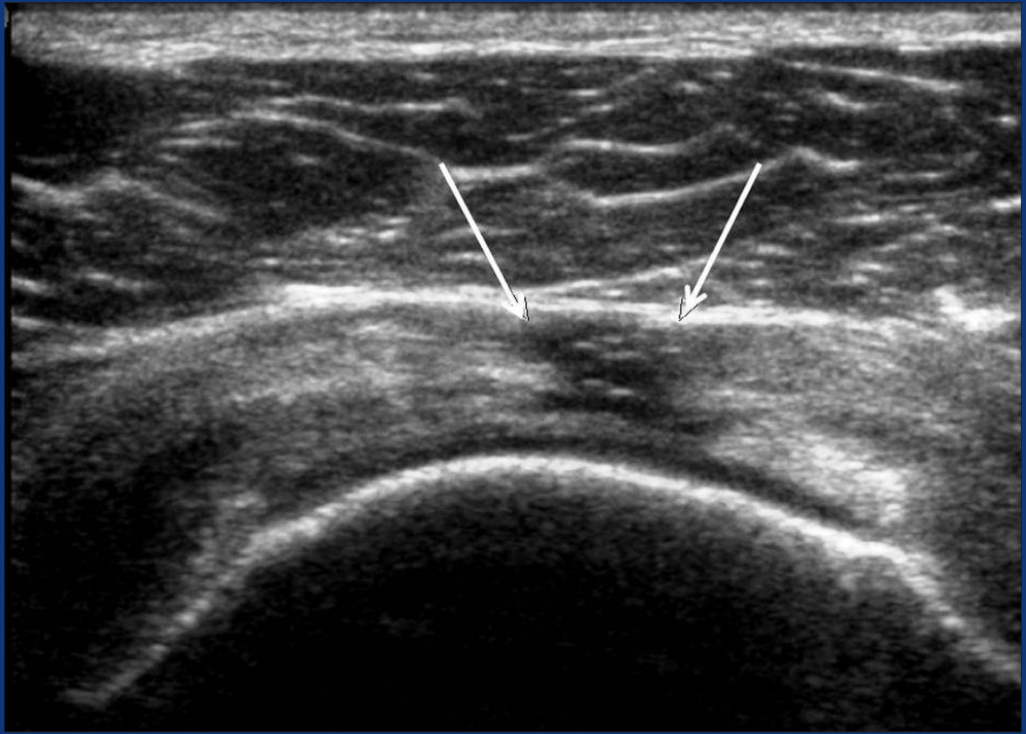
Shoulder Ultrasound

- Supraspinatus tendon



Shoulder Ultrasound

- Supraspinatus tendon



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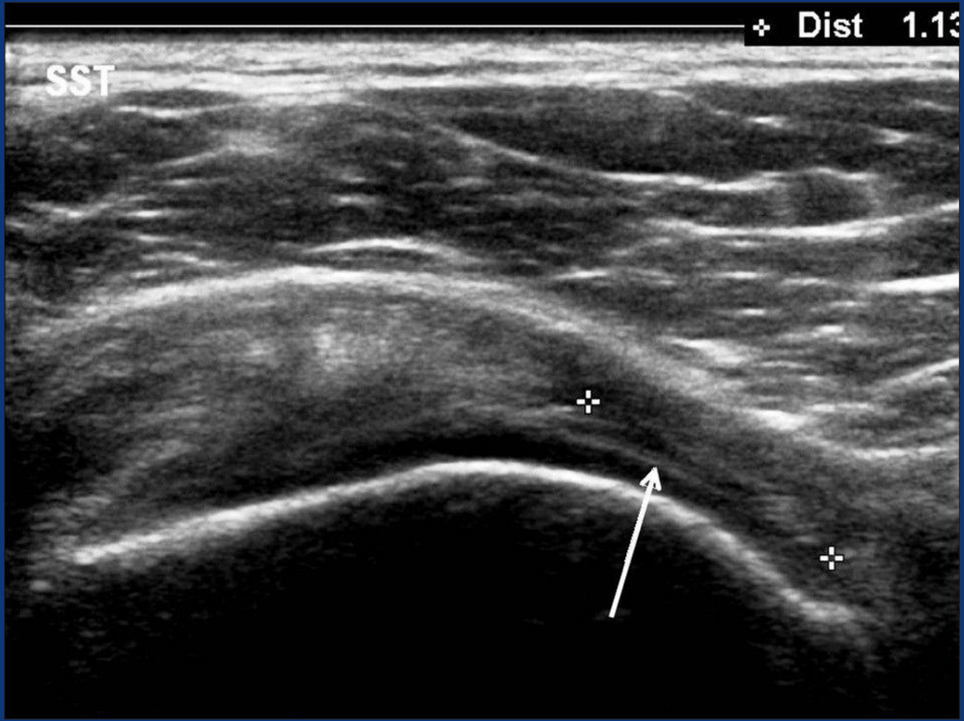

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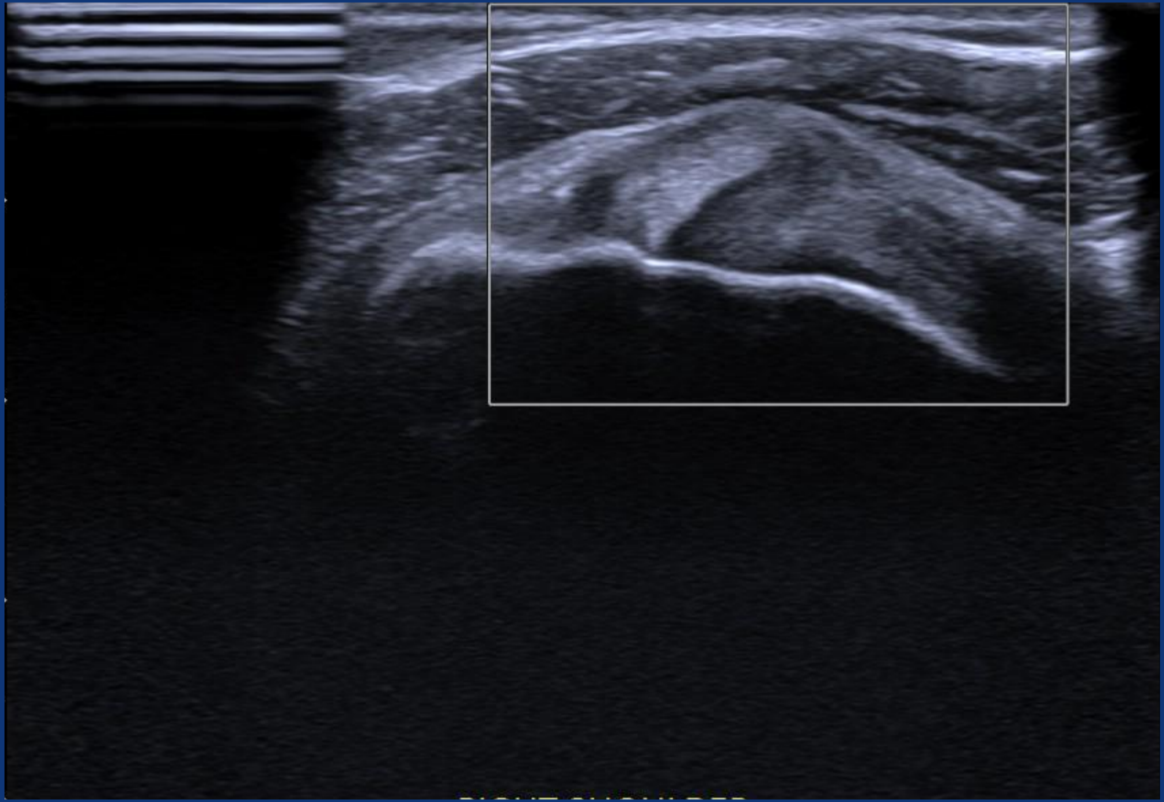
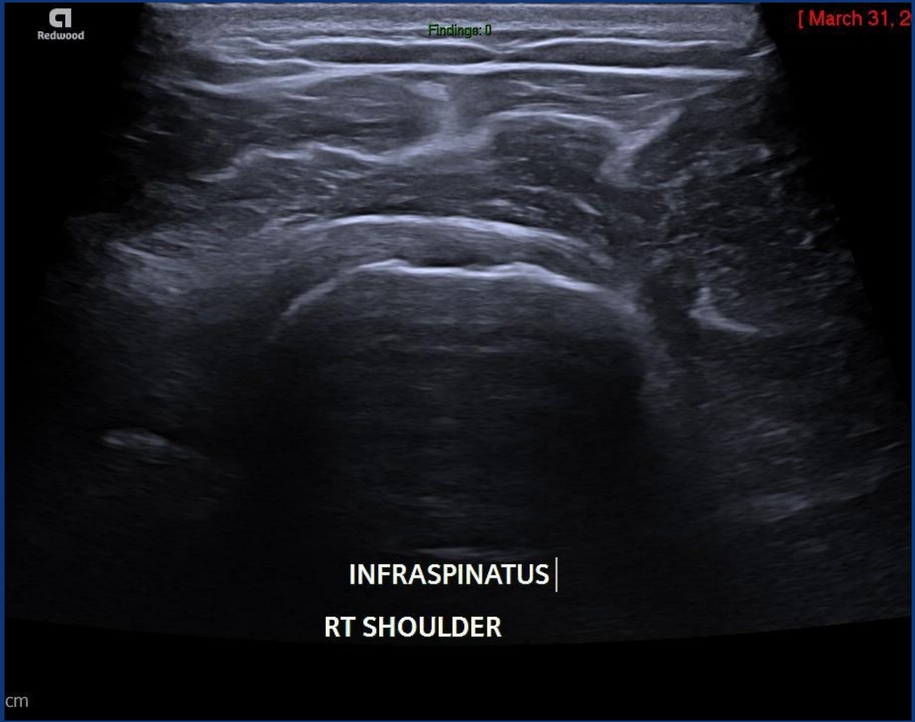


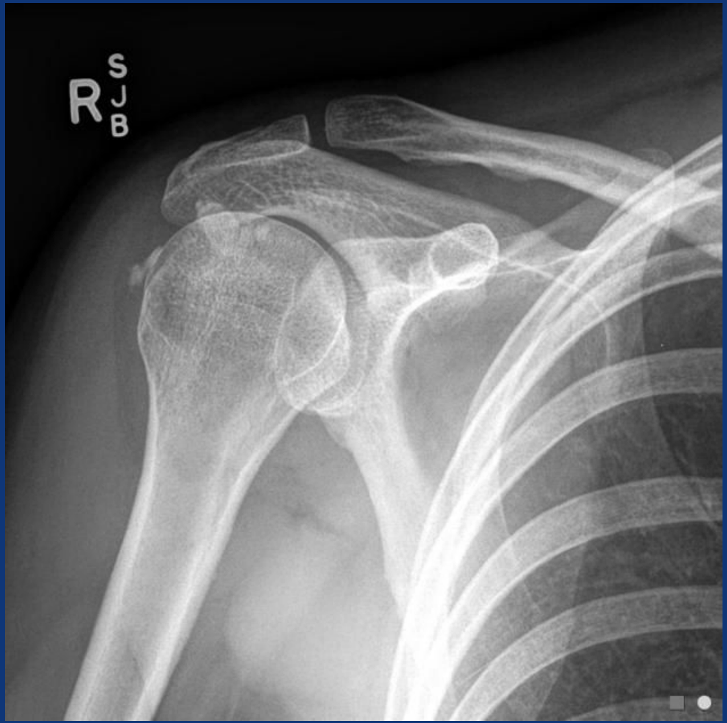
65M shoulder pain

- Infraspinatus tendon



Shoulder Ultrasound

- Infraspinatus tendon



Shoulder Ultrasound

Sources:

1) Shoulder US: Anatomy, Technique, and Scanning Pitfalls. Jon A. Jacobson. Radiology 2011 260:1, 6-16
2) https://www.essr.org/content-essr/uploads/2016/10/shoulder.pdf
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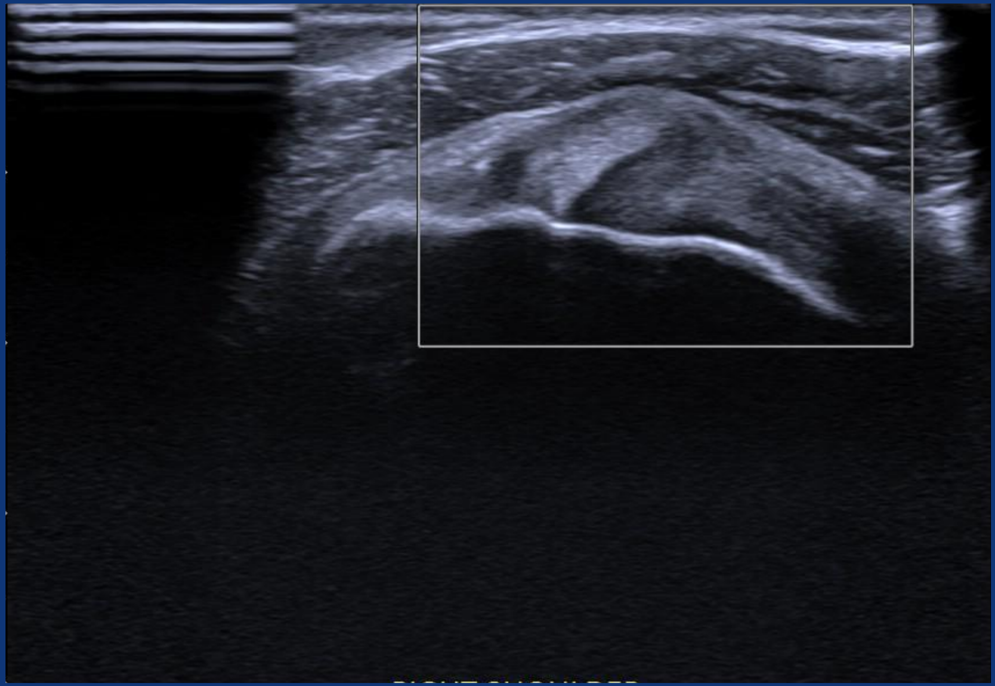
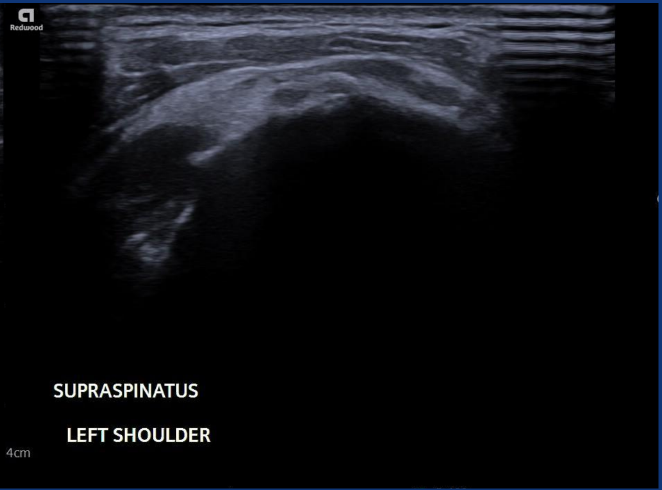
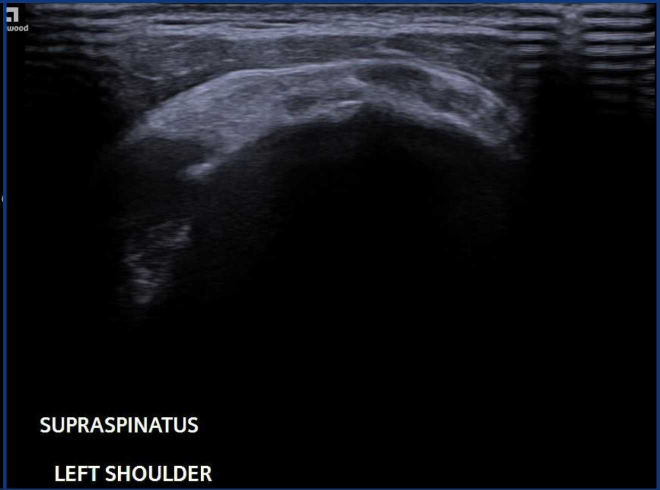
5) Martinoli C, Bianchi S, Prato N, Pugliese F, Zamorani MP, Valle M, . US of the Shoulder: Non-rotator cuff disorders. Radiographics. 2003;23:381-401.
6) Le Corroller T, Cohen M, Aswad R, Pauly V, Champsaur P, . Sonography of the painful shoulder: Role of the operator's experience. Skeletal Radiol. 2008;37:979-86.
7) Gaitini D, Militianu D, Nachtigal A, Dogra V, . Imaging of the Shoulder. In: Dogra V, Gaitini D, eds. Musculoskeletal ultrasound with MRI correlations. Stuttgart and New York: Thieme Medical Publishers; 2010. p. :1-21.

60F Shoulder pain



85M rule out tear/strain





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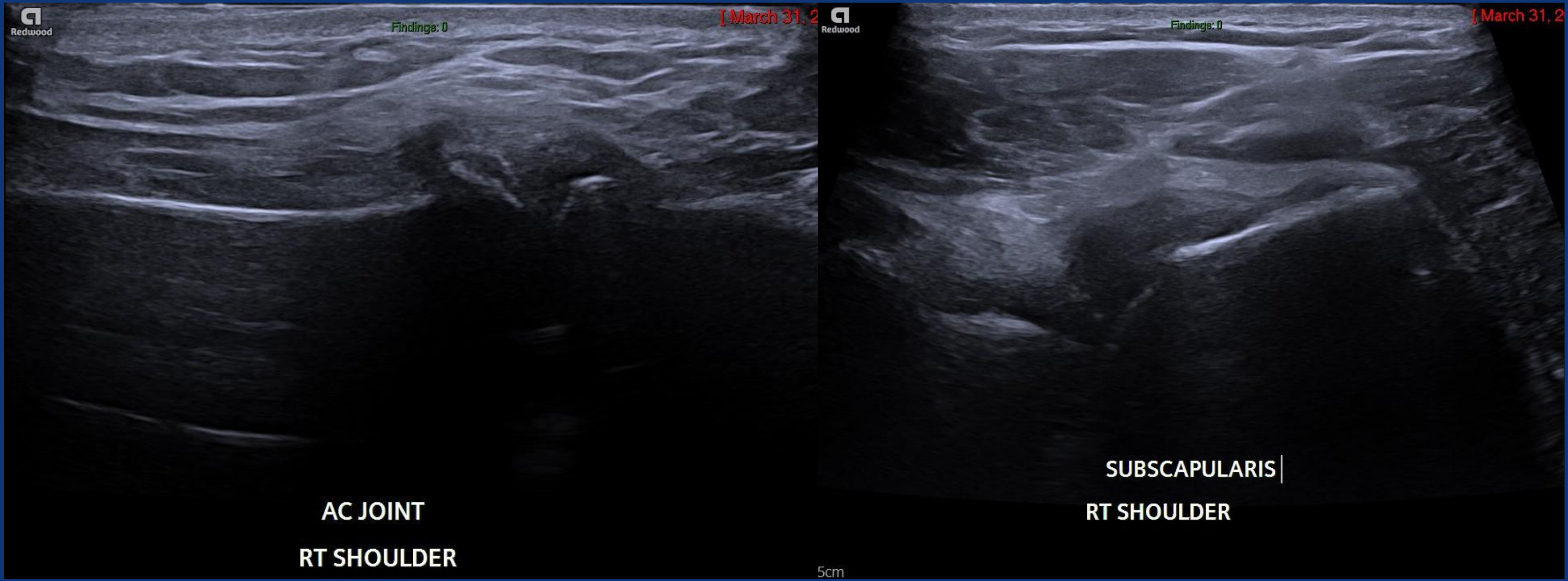
65M shoulder pain



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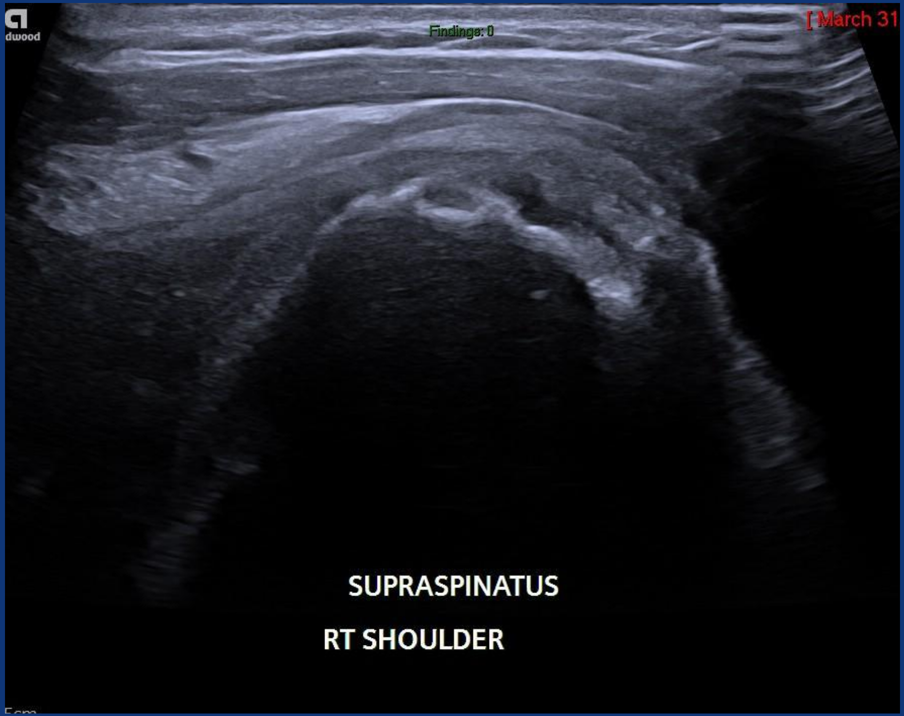

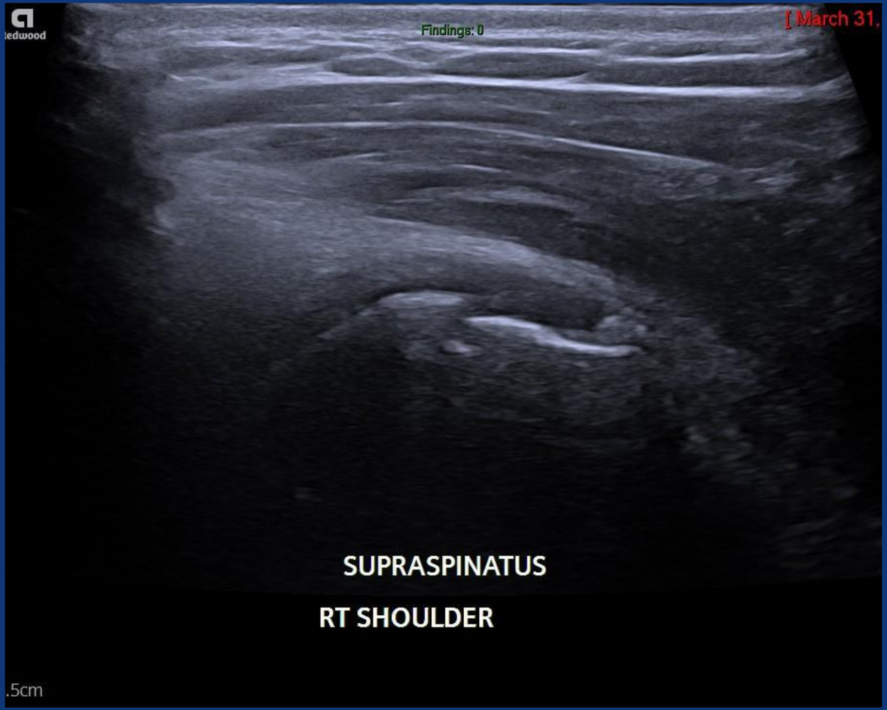

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