

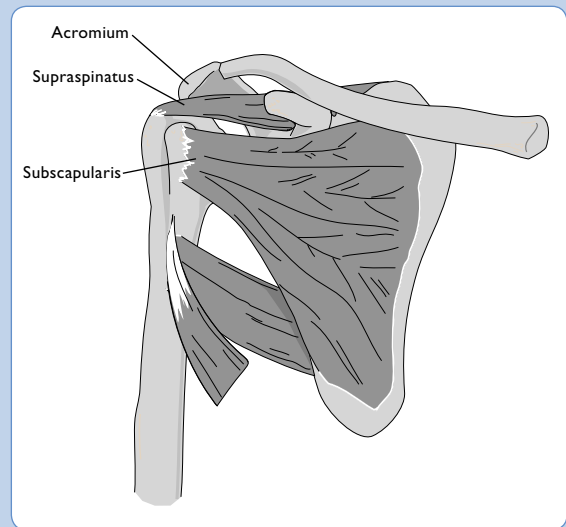
Ultrasound of the Shoulder

Indications

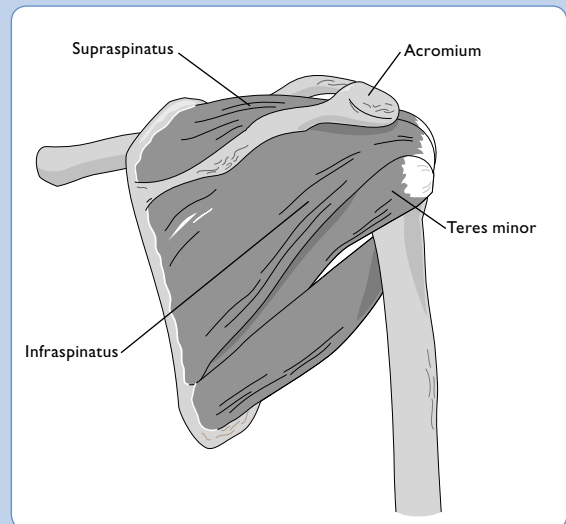
- Rotator cuff tears
- Subdeltoid-subacromial bursitis (SD-SA)
- Biceps tendonitis/tenosynovitis
- Gleno-humeral effusion

Clinical presentation

Patients present with a dull chronic pain in the shoulder. These patients have difficulty sleeping on one side or the other. They may present with complaints of inability to comb their hair or lift their arm above the shoulder.



The shoulder from the front.



The shoulder from the back.

Technique

The scan is best performed with a high resolution linear array transducer. The patient is examined sitting on a rotating stool while the examiner is lateral to the symptomatic shoulder. The arm should be in the neutral position.

The biceps tendon (see Images 1 and 2)

Examine the proximal biceps tendon in the transverse plane along the bicipital groove. Document its position, ruling out subluxation or dislocation. Examine distally. Return proximally, examine the biceps tendon longitudinally. Document any tendonitis or fluid collection associated with the tendon.

The subscapularis tendon (see Image 3)

Return to the transverse plane, examine the subscapularis. Documentation should be taken with the arm in both neutral and externally rotated positions.

Document any bony surface irregularities, fluid or bursal thickness. Documentation should be taken in both transverse and longitudinal planes.



Image 1: Normal biceps tendon.



Image 2: Transverse view of biceps tendon with infectious bursitis and tenosynovitis. Note the vinculum attached to the tendon.



Image 3: Normal subscapularis tendon.

The supraspinatus/infraspinatus tendon
(see Images 4-10)

To examine the remaining tendons the arm should be hyperextended and internally rotated. Moving laterally in a longitudinal plane, image the supraspinatus tendon as it attaches to the greater tuberosity of the humerus.

Move the transducer through the supraspinatus and note any bony or bursal contour abnormalities.

Continue laterally to the infraspinatus tendon and evaluate its attachment to the humerus.

Return to a transverse plane and examine the supraspinatus, moving posteriorly to the infraspinatus. Note any changes in contour or echogenicity of the tendon.

Evaluate the posterior labrum for joint effusion and/or cyst. This can be found separating the infraspinatus from the glenoid.

Criteria of the tear

- Abnormalities seen in two imaging planes
 - absence of supraspinatus
 - contour defect of the tendon
- Abnormalities seen in one imaging plane only
 - cartilage interface sign
 - naked tuberosity sign



Image 4: Normal infraspinatus tendon.



Image 5: This longitudinal image demonstrates the normal appearance of the supraspinatus tendon.



Image 6: Longitudinal view of full-thickness tear of the supraspinatus tendon.



Image 7: This transverse image shows a massive tear of the supraspinatus tendon. Note the absence of the tendon as the deltoid muscle is resting on the humeral head surface.



Image 8: Transverse view of a full thickness tear of the supraspinatus tendon. Note the distracted tendon and a positive "cartilage interface" sign.



Image 9: Longitudinal view of full-thickness tear of the supraspinatus tendon. Note the tendon appears only partially torn.



Image 10: Transverse view of full-thickness tear of the supraspinatus tendon seen in Image 9. Note the course of the tear. It cannot be appreciated completely in a single longitudinal plane.

Pitfalls

1. Be careful when examining the intra-capsular segment of the biceps tendon. It may mimic subluxation.
2. Fluid in the subdeltoid bursa may mimic tenosynovitis of the biceps tendon.
3. Watch out for anisotropy, the sonographic drop-out due to poor angulation of the transducer with respect to the tendon. The tendon should be perpendicular to the transducer whenever possible.
4. Shadowing from thickened deltoid muscle septum causes hypoechoic appearance of the supraspinatus tendon.
5. In the transverse image, do not mistake transition from supraspinatus to infraspinatus as thinning.
6. Do not mistake the normal bare area underneath the infraspinatus for cortical pitting.



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