

Case study # 13 Shoulder 2nd treatment

Patient had previously visited our clinic for severe left shoulder pain and extremely limited range of motion. At the time it was determined that she was a good candidate for treatment with placental tissue matrix (PTM) and decided to proceed with the therapy.

The treatment was largely successful and provided both pain relief as well as increased range of motion, however due to the severity of her injury it was determined a second treatment would be beneficial, she agreed and returned for a second treatment with PTM.

Presented below are both the original case study for the second treatment as well as the original case study for background and context.

Case study for second treatment with PTM

After returning for the follow-up ultrasound scan it was determined that the patient could benefit from a second treatment given the positive response resulting from the original treatment.

This protocol was focused on the few regions that exhibited minimal remodeling after the original treatment. Those regions are denoted below:

Images of the long head of the biceps in multiple planes demonstrate increased echogenicity and fibrous echotexture of the tendon proximally. The acoustic landmarks and humeral cortex on the comparative images mimic those of the initial exam. This ensures reproducible angle of insonation. Findings are suggestive of significant tendon fiber remodeling.

Minimal sonographic evidence relative to increased tendon echodensity is noted on the supraspinatus tendon images. The tendon attachment remains nearly absent. However; the previous peri – tendinous fluid is absent.

The acromio-clavicular joint demonstrates intra-articular fluid/effusion, but the image suggests decreased intra – articular debris.

Below are the volumes and treatment sites for the second treatment:

Total volume 3.5 CC's 1 PX50 w/3 CC's saline

1.0 CC's Biceps tendon: In-plane, distal to proximal

1.5 CC's Supraspinatus attachment: In-plane, distal to proximal

1.0 CC's AC joint: Out of plane

All sites were identified under ultrasound guidance and product was introduced with high accuracy.

Patient returned 112 days status post product placement for re-evaluation with ultrasound. Patient states that she feels great and has returned to near full range of motion. She was able to perform modified crass with ease which was impossible at original ultrasound exam.

Below are the follow up findings to the second treatment:

DOE: 12/30/16

Left Shoulder Exam: 2nd Follow up

A focused examination of the left shoulder is performed as a 2nd follow up to an exam initially done in April 2016. Long head of the biceps echo-density in short axis is noted as being increased, but not fully resolved. Long axis views of the bicep tendon demonstrate increased visibility of anticipated return to normal fibrous echo-texture of the tendon.

The follow up supraspinatus short axis image is performed at a different magnification; however significant decreased peri-tendinous fluid is easily noted. The tendon substance itself appears to have remodeled to become continuous fibers, on long axis. This is a reliable finding due to patient positioning which stresses the tendon under imaging.

The AC joint remains effused with a distended ligament/joint capsule. The dynamic internal rotation view indicates the joint remains unstable, and is positive for AC joint impingement.

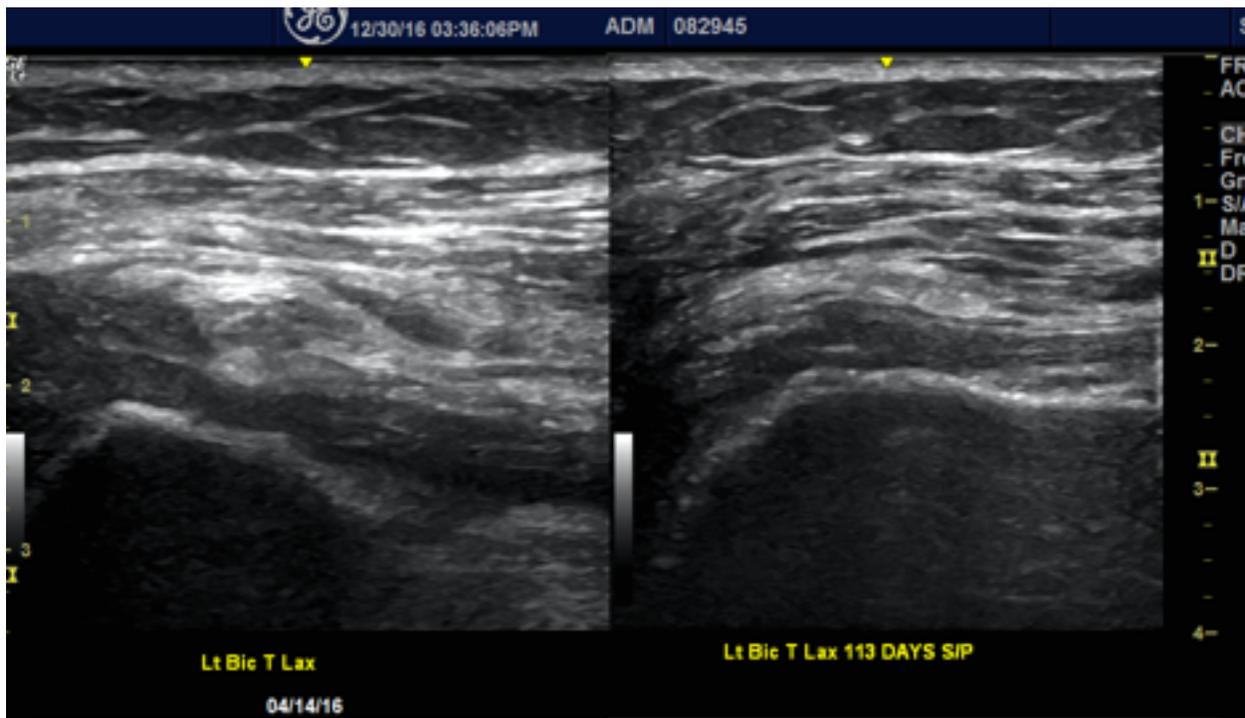
Findings:

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Sonographic evidence of positive response and remodeling of the biceps and supraspinatus tendons. Unresolved AC joint instability and effusion.

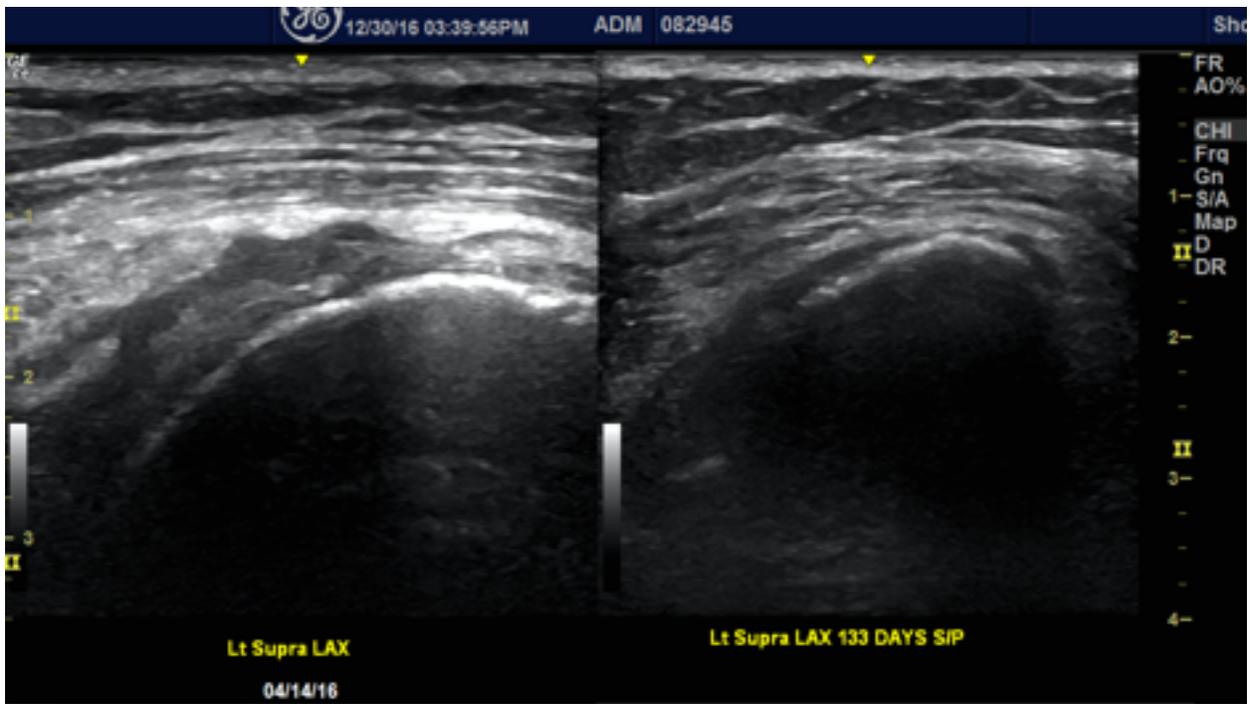
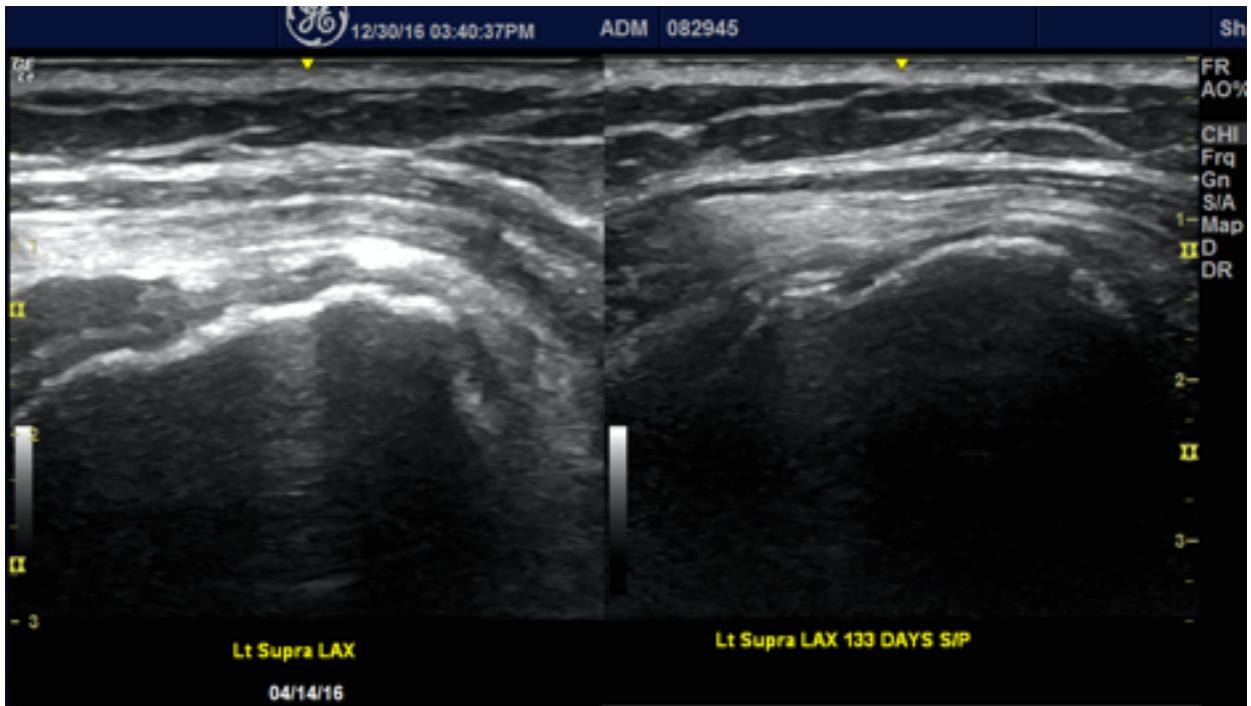
Randy E. Moore RDMS RMSK

Images below are from the original scan and follow up scan to the second treatment. The follow up image of the long axis views of the bicep tendon demonstrate increased visibility of anticipated return to normal fibrous echo-texture of the tendon.



Below are two before and afters of the supraspinatus, with one being obtained more posterior at the enthesis. The tendon substance itself appears to have remodeled to become continuous fibers, on long axis. This is a reliable finding due to patient positioning which stresses the tendon under imaging.

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Original case study

Patient is a morbidly obese 70 year old female presenting with left shoulder pain after a severe fall. Patient is in moderate to severe pain with extremely limited range of motion due to extensive shoulder injury.

This patient came to our clinic to undergo sonographic exam of the left shoulder to determine if she may be a candidate for treatment with Placental Tissue Matrix under ultrasound guidance. Patient has a previous MRI scan without contrast noting several defects within the shoulder/rotator cuff. The following is a brief overview of the MRI findings:

- *OA of left AC joint with moderate encroachment of the Supraspinatus myotendinous junction.*
- *Approx. 1 cm full thickness tear of the Supraspinatus tendon at it's origin with approx. 3cm retraction.*
- *Biceps tendon was not visualized entering the joint, possible avulsion.*
- *There is a Buford complex.*

Impression:

Moderate entrapment anatomy from left A joint OA.

Full thickness tear of Supraspinatus with 3cm retraction and joint/bursal effusions.

Long head of the biceps tendon was not seen in the intra-articular space. This could be torn as well.

A complete left shoulder US exam was performed. It should be noted that the exam was technically difficult due to the patients body habitus, pain levels and poor range of motion. The patient did not tolerate the exam very well. The following are the US findings:

DOB: 08/29/45

DOE: 04/01/16

Left Shoulder

Long Head of the Biceps SAX and LAX

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The Biceps Tendon is not visible within the inter-tubercular groove on SAX. No herniation of the Transverse Humeral Ligament. On LAX, the Biceps tendon reveals a full thickness tear with the stump appearing approximately at the level of the Coracoid process.

Subscapularis Tendon SAX and LAX

The Subscapularis tendon, is highly tendinotic and has little or no normal fibrous echotexture. Volume loss of the tendon is compatible with significant intra-substance tears/fiber failure. The proximal end of the fully torn Biceps is seen in a medially subluxed position on the Lesser Tuberosity.

Acromio-Clavicular Joint

The cortical margins of the Acromion and Clavicle are irregular with bone proliferation/spurs. The "Geyser" sign indicating joint effusion is present. The Clavicle is elevated above the Acromion as seen with shoulder separation. The joint is unstable. No significant joint space is evident in neutral position. AC joint impingement is demonstrated.

Supraspinatus Tendon SAX and LAX

The Humeral cortex is significantly irregular and the hyaline cartilage interface is apparently maintained. On SAX, there is a complete, full-thickness tear of the Supraspinatus, with a distinct "cartilage interface sign". This sonographic indicator is variable in occurrence with full-thickness tears, but is highly reliable when visualized. LAX views do not demonstrate the Greater Tuberosity bony landmark, thus correct angle of insonation cannot be assumed. There is significant cortical irregularity deep to what appears to be hyperechoic tendon fibers. A fluid interface between the visible bone and these fibers is demonstrated. It is unlikely a full-thickness intra-substance tear would be accompanied by a complete rupture from the GT. Limitation in patient positioning may be a contributing factor.

Infraspinatus Tendon SAX

The tendon demonstrates loss of fibrous echotexture and also advanced calcific tendinosis.

Gleno-Humeral Joint

The Gleno-Humeral joint is unremarkable. The Humeral convexity is well demonstrated, and no sonographic indication of labral irregularity or joint effusion.

Anterior Impingement

Dynamic imaging with patient arm flexion/abduction was not performed due to patient limitations

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After consultation with the patient she decided to undergo treatment with Placental Tissue Matrix in order to reduce pain and increase mobility. It should be noted that the US exam suggested that native Bicep tendinous tissue may still be present within the groove despite the MRI exam's findings, therefore we opted to treat the potential remnant tissue as we were already treating known viable tissue. One PX100 was utilized and mixed with 5 CC's saline.

The patient returned approx. 90 days status post product placement for her follow-up US scan. The patient stated a significant reduction in pain with a notable increase in mobility and was very happy with her result. Patient tolerated the exam significantly better than the original scan and was able to perform a modified Crass fairly well.

The following are the follow-up US findings:

DOB: 08/29/45

DOE: 08/11/16

Comprehensive images of the left shoulder were presented in follow-up to an examination performed on 4/1/16.

Images of the long head of the biceps in multiple planes demonstrate increased echogenicity and fibrous echotexture of the tendon proximally. The acoustic landmarks and humeral cortex on the comparative images mimic those of the initial exam. This ensures reproducible angle of insonation. Findings are suggestive of significant tendon fiber remodeling.

The subscapularis tendon in transverse/short axis probe orientation at the lesser tuberosity insertion is identified. There is more identifiable echogenic tendon substance noted. Cortical hype-rechoic defects at the enthesis persist.

Minimal sonographic evidence relative to increased tendon echo-density is noted on the supraspinatus tendon images. The tendon attachment remains nearly absent. However; the previous peri - tendinous fluid is absent.

The acromio-clavicular joint demonstrates intra-articular fluid/effusion, but the image suggests decreased intra - articular debris.

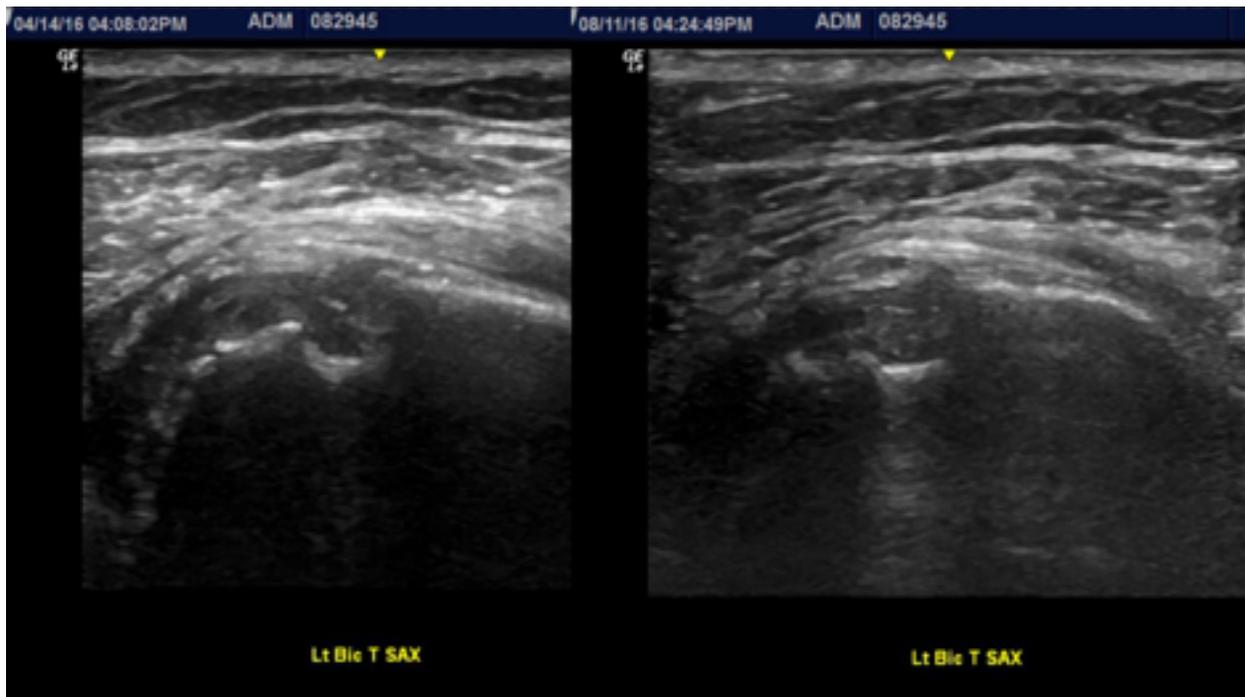
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Findings:

Findings suggestive of notable biceps and subscapularis tendon remodeling. Almost no sonographic evidence of increased tendon substance relative to the supraspinatus tendon. Persistent AC joint effusion with apparent diminished intra-articular debris.

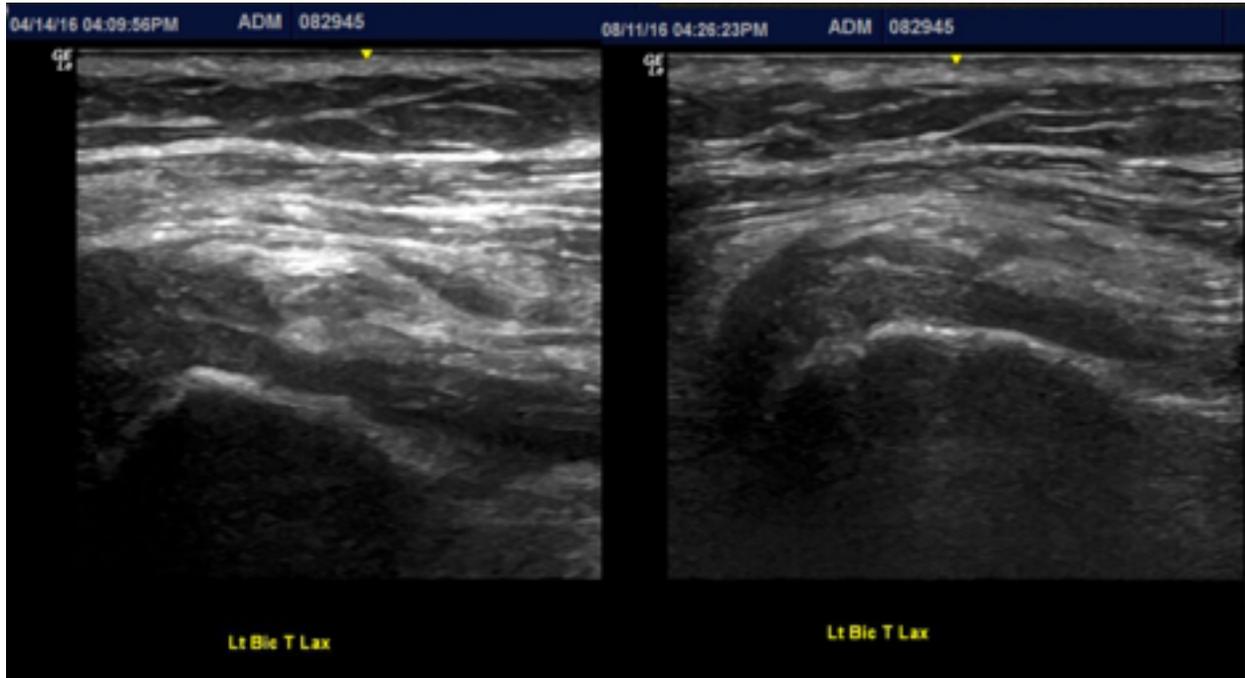
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Below are pre and post images of the biceps tendon in short axis demonstrating a notable biceps tendon within the groove in SAX demonstrating increased echo-genicity and fibrous echo-texture of the tendon proximally.



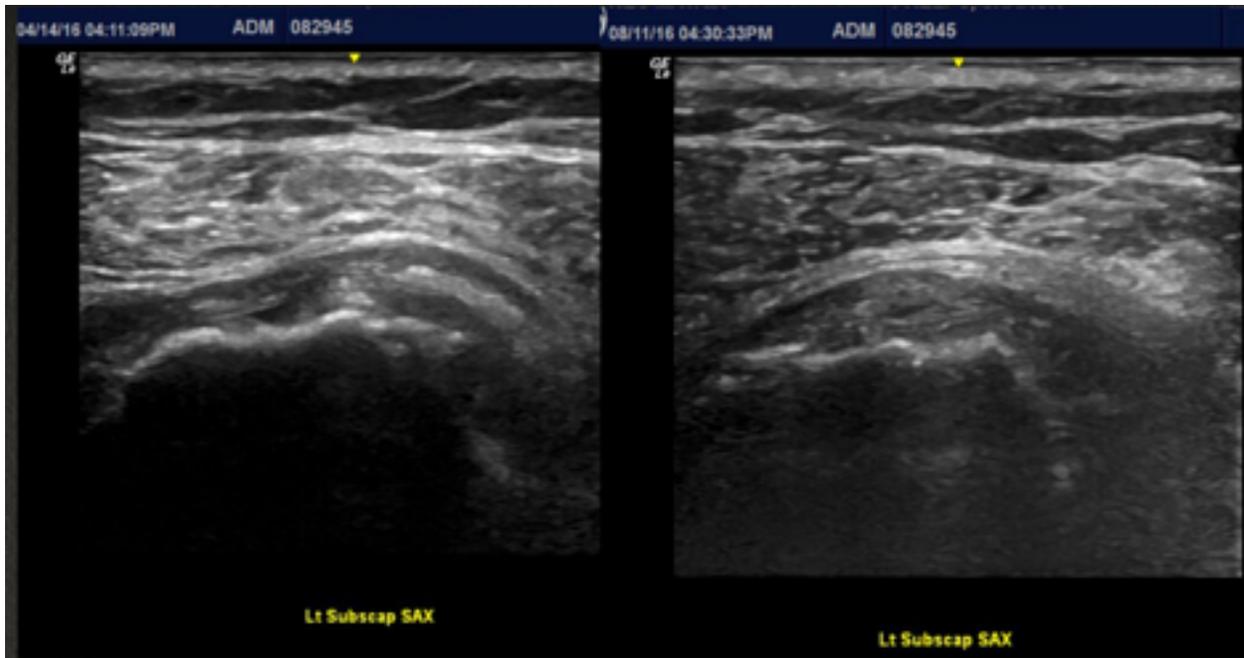
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Below are pre and post images of the biceps tendon in long axis which demonstrate increased echo-genicity and fibrous echo-texture of the tendon proximally.

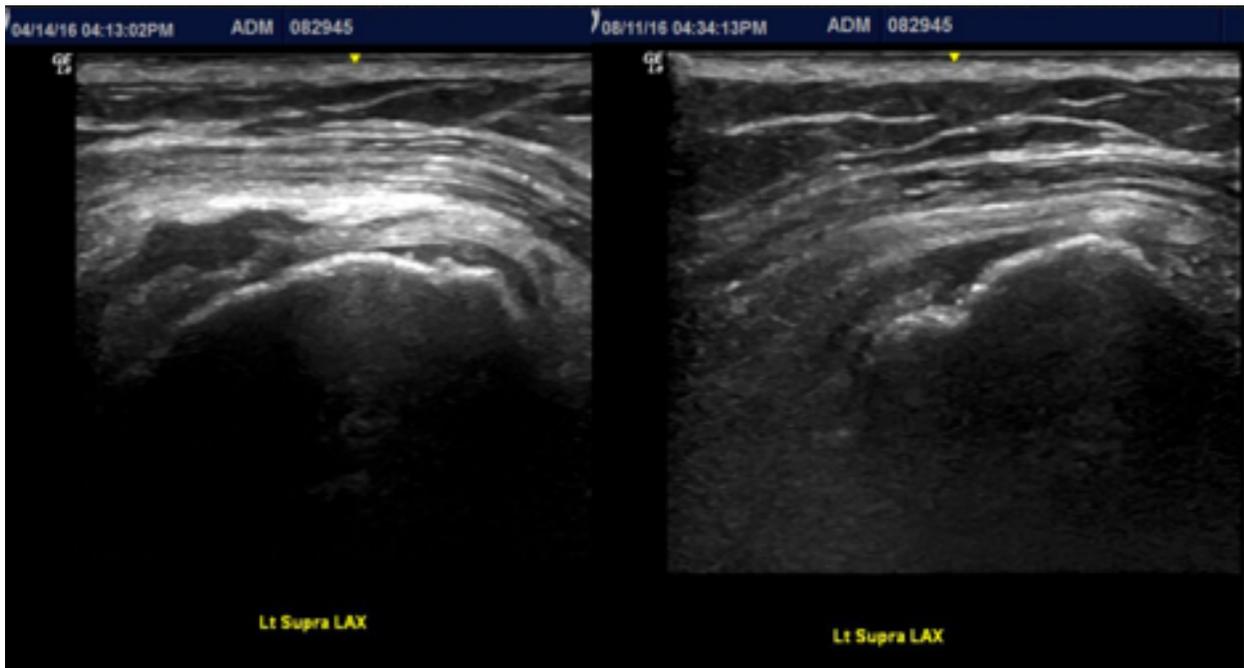


Below are pre and post images of the Subscapularis in it's visible long axis acquired in a SAX plane, there is more identifiable echogenic tendon substance noted.

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Below are pre and post images of the Supraspinatus in LAX view, minimal sonographic evidence relative to increased tendon echo-density is noted.



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