

MSK Ultrasound Clinical Case Study

Early adhesive capsulitis



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Introduction

Adhesive capsulitis of the shoulder is characterized by thickening and contraction of the glenohumeral joint and the surrounding synovium, resulting in stiffness, pain, and dysfunction. The condition can be classified as either spontaneous or idiopathic with an absence of preceding trauma or secondary, as a result of either repetitive trauma, shoulder or thoracic surgery or related to rheumatological or endocrine conditions.

Clinical presentation of adhesive capsulitis can be broken into three overlapping stages: freezing (acute and painful), frozen (transitional and adhesive) and thawing (resolution). There is typically a slow regression of active and passive range of motion. Patients commonly present for medical investigation at the late stage of the acute, freezing stage.

Case Study

A 62-year-old man presented with decreased range of motion in his right shoulder and was referred for an ultrasound, querying the presence of osteoarthritis, bursitis, or a muscular/tendon tear.

An ultrasound was performed using the Aplio i800 / Prism Edition and an 18 MHz high frequency linear matrix transducer (PLI-1205BX).

A small effusion of the small biceps tendon sheath, with thickening and mild vascularity of the rotator cuff interval was seen. There was mild thickening and asymmetry of the right inferior glenohumeral ligament (IGHL) and axillary recess compared to the left side. Bursal thickness appeared within normal limits and minimal age-related changes were seen in the rotator cuff tendons.

These findings were suggestive of early adhesive capsulitis and mild rotator cuff tendinosis. The patient was referred for a follow-up image-guided injection of the glenohumeral joint.



Figure 1 Transverse imaging of the biceps tendon - utilizing iBeam+ and Full Focus - shows fluid in the surrounding sheath.

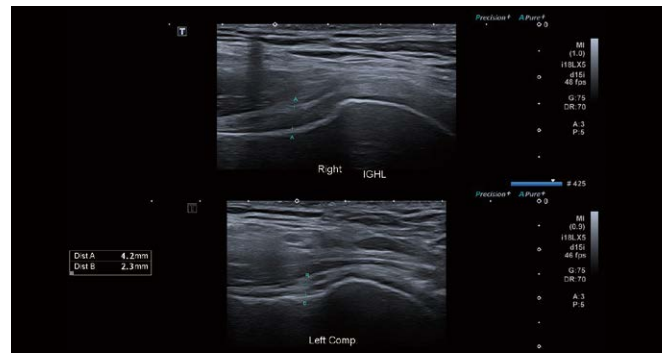


Figure 2 Canon's up and down dual screen display conveniently demonstrates that the IGHL is slightly thicker on the right compared to the asymptomatic left side.

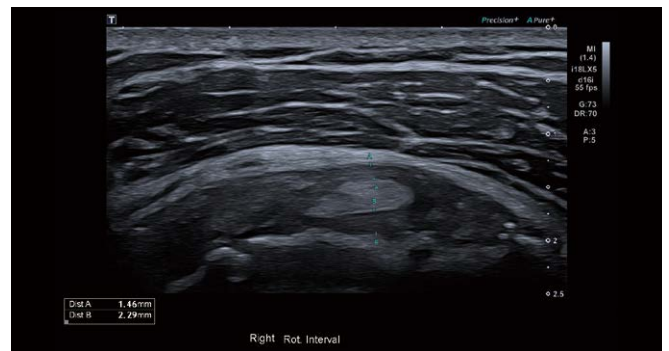


Figure 3 Thickening of the rotator cuff interval can be seen and Superb Micro-vascular Imaging (SMI) mode demonstrates vascularity.

Discussion

The shoulder can be challenging to scan with multiple superficial tendons and ligaments requiring high resolution for optimal visualization and the deeper joint and recesses requiring greater penetration.

A high frequency matrix transducer was used throughout this entire examination. The Aplio transducers provide a broad range of frequencies, enabling superficial and deep areas to be examined with a single transducer. This is because:

- Broad band transducer technology where frequencies from 5 MHz-18 MHz are used in production of the ultrasound image with the use of differential harmonics.
- Differential harmonics provide maximum penetration without resolution trade off.

- Manual adjustment of frequency range is available without changing transducers. In this case a 16 MHz frequency was used initially and then lowered to 15 MHz to obtain optimal visualization of deeper structures.
- intelligent Dynamic Micro-Slice (iDMS) technology on matrix transducers controls transducer elements separately to produce a fine beam in the azimuthal plane, maintaining continuous focus from near to far field.
- iBeam+ technology on the new Aplio i-series / Prism Edition provides sharper images and improved penetration while maintaining superior spatial and contrast resolution – due to 4 times faster image processing capability*.

*compared to the previous versions of Aplio i-series.

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