

An Often Missed Finding in Ultrasonographic Shoulder Examination

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SECTION 2 – ANSWER

Case

A 52-year-old right-handed woman presented with right shoulder pain compatible with rotator cuff tendinopathy, subacromial bursitis, and subsequent subacromial impingement syndrome for 8 months. X-ray of the right shoulder performed a month earlier was within normal limits.

She was then referred to the physical medicine and rehabilitation ultrasound (US) clinic for shoulder evaluation and US-guided appropriated steroid injection.

A standardized US evaluation^[1] of both shoulders was conducted with an US machine (Samsung RS80A, Samsung Medison Co., Ltd., Seoul, Korea) equipped with a linear LA4-18B probe. The long head of biceps (LHB) tendon was within normal limits, without any effusion, but there was, just superficial to it, an oval-shaped fibrillar structure seen coursing from the rotator cuff near the rotator interval all the way down to the pectoralis major tendon at the level of the myotendinous junction of the LHB [Figures 1-4]. This structure was moderately painful with sonopalpation.

The subscapularis tendon was within normal limits, as well as the acromioclavicular joint. The supraspinatus tendon exhibited a small bursal-sided partial tear of its distal and anterior fibers of <20% of its width, associated with a subacromial bursa distension of 2.1 mm [Figure 5]. The infraspinatus tendon and the posterior glenohumeral joint were normal.

The patient exhibited grade 2 subacromial ultrasonographic impingement caused by subacromial bursopathy.

A right US-guided steroid injection (40 mg of methylprednisolone acetate mixed with 2 mL of 1% lidocaine) was performed

using an in-plane approach with a somewhat oblique view of the rotator interval to optimize visualization of the bursa as well as the peri “accessory biceps tendon” effusion. In a single injection, 1 mL of the mixture was injected around the above-mentioned tendinous structure and 2 mL was injected in the subacromial bursa [Figure 6]. The procedure was well tolerated, and the pain 10 min postprocedure had disappeared with overhead movements. She evolved well over time.

Interpretation

This is the case of a 52-year-old woman with supraspinatus tendinopathy, subacromial bursopathy, and an associated anatomical variant: an aponeurotic expansion of the

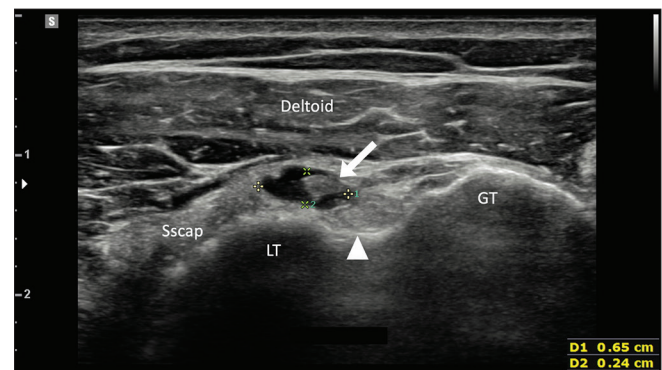


Figure 1: Ultrasound of the right supraspinatus aponeurotic expansion surrounded by effusion, overlying the long head of biceps tendon, transverse axis. Arrow: Aponeurotic expansion, arrowhead: Long head of biceps tendon, Sscap: Subscapularis tendon, LT: Lesser tuberosity, GT: Greater tuberosity

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How to cite this article: Boissonnault È, Chang MC, Boudier-Rev  ret M. An often missed finding in ultrasonographic shoulder examination. *J Med Ultrasound* 2021;29:68-70.

Received: 23-03-2020 Revised: 10-04-2020 Accepted: 16-04-2020 Available Online: 12-06-2020

Video Available on: www.jmuonline.org

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10.4103/JMU.JMU_40_20

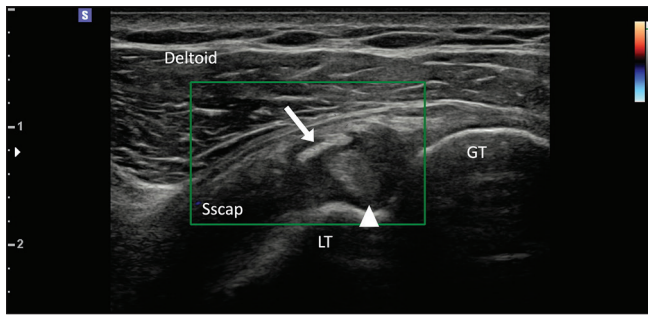


Figure 2: Ultrasound of the right supraspinatus aponeurotic expansion, overlying the long head of biceps tendon, transverse axis, with power Doppler activated. Arrow: Aponeurotic expansion, arrowhead: Long head of biceps tendon, Sscap: Subscapularis tendon, LT: Lesser tuberosity, GT: Greater tuberosity

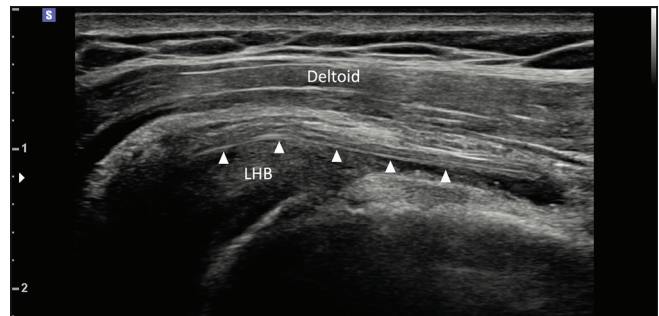


Figure 3: Ultrasound of the supraspinatus aponeurotic expansion surrounded by effusion, at the level of the bicipital groove of the humerus, longitudinal axis. Arrowheads: Aponeurotic expansion, LHB: Long head of biceps tendon

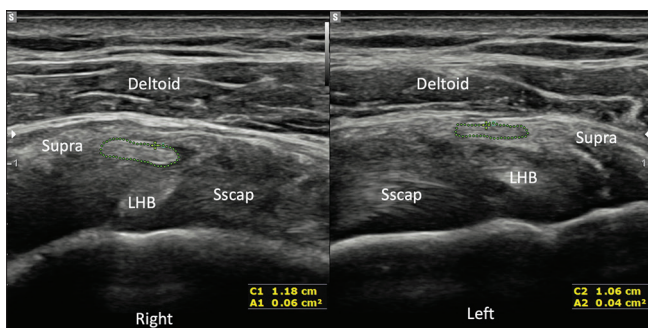


Figure 4: Ultrasound of the right and left supraspinatus aponeurotic expansion overlying the long head of biceps tendon, at the rotator interval, transverse axis. LHB: Long head of biceps tendon, Sscap: Subscapularis tendon, Supra: Supraspinatus tendon

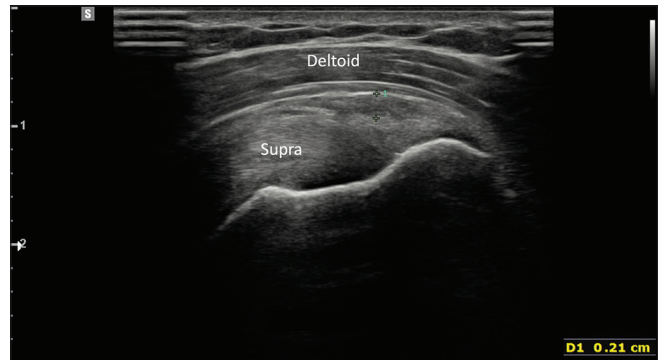


Figure 5: Ultrasound of the right supraspinatus tendon with bursal-sided partial tear of its distal and anterior fibers, associated with a subacromial bursa distension of 2.1 mm, oblique view. Supra: Supraspinatus tendon

supraspinatus tendon at the level of the bicipital groove corresponding to a type 2A variant according to the classification proposed by Moser *et al.*^[2] We can appreciate bilaterally the oval tendon-like structure that originates from the superficial fibers of the most anterior aspect of the supraspinatus tendon, runs anterior, and lateral to the LHB in its groove and inserts distally to the pectoralis major tendon next to its humeral insertion [Video 1]. On the right side, this expansion was surrounded by a small quantity of liquid. We hypothesize that the small bursal-sided chronic tear of the supraspinatus in its anterior and distal portion could create a communication with the subacromial bursa and explain the effusion seen in the aponeurotic expansion sheath.

DISCUSSION

This structure is often missed or mistakenly referred to as a bifid tendon or split tear of the LHB in case reports, case series, and small retrospective studies.^[3-8] However, recent literature considers we should prefer the terminology of aponeurotic expansion or slip of the supraspinatus tendon, as described for the first time by Brodie in 1890, because it is not connected to the LHB despite its anatomical proximity.^[2,9,10] A retrospective study of 150 shoulder magnetic resonance imaging (MRI)

performed for various reasons at one institution and 50 US on cadaveric shoulders revealed that aponeurotic expansion of the supraspinatus located anterior and lateral to the LHB in its groove can be identified in about half of the shoulders on MRI or US.

A classification was developed in which type 0 is nonvisualization of tendon-like structures anterior to the LHB at the level of the bicipital groove; type 1 is a thin, flat, tendon-like structure overlying the bicipital groove; type 2A is an oval tendon-like structure <50% the size of the adjacent LHB tendon section, and type 2B is an oval tendon-like structure more than 50% the size of the adjacent LHB tendon section.^[2]

In our patient, it was unclear if we should consider the expansion as a true pain generator. To date, there is no evidence in the literature that it constitutes a risk factor for shoulder pathologies. Due to its high prevalence demonstrated by Moser *et al.*,^[2] we hypothesize that this variant is usually not correlated with pain. However, as an aponeurotic structure, we assume it is innervated with nociceptive fibers and therefore should be considered as a differential diagnosis for pain generators.

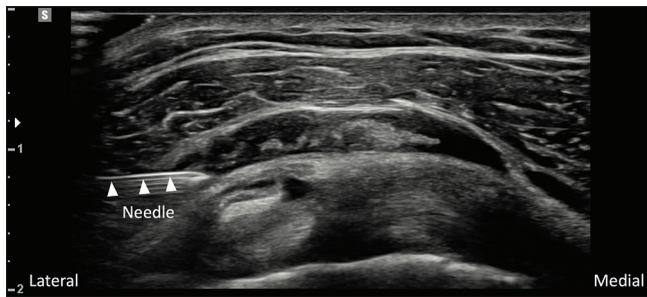


Figure 6: Ultrasound-guided steroid injection of the right subacromial bursa and around the supraspinatus aponeurotic expansion, in-plane approach from lateral to medial, oblique view of the rotator interval

With increasingly precise and sophisticated imaging technologies, it is important to be aware of this structure, to avoid misinterpretation and misdiagnosis.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understand that her name and initials will not be published and due efforts will be made to conceal her identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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