



Letter to the Editor Regarding “Ultrasound Features of Adhesive Capsulitis”

Mathieu Boudier-Revéret · Ming-Yen Hsiao · Min Cheol Chang

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To the editor:

We have read with great interest the recently published article entitled, “Ultrasound Features of Adhesive Capsulitis” by Stella et al. [1] Their main ultrasound findings on 106 patients with adhesive capsulitis included axillary pouch thickening, reduced sliding of the infraspinatus tendon, and thickening of the shoulder pulleys. Regarding axillary pouch thickening, the cut-off values they presented of > 4 mm or > 60% of the contralateral unaffected side strengthen the

ones that had been obtained by Michelin et al. [2] in smaller cohort of 20 patients with unilateral adhesive capsulitis with affected shoulders having an average AP thickness of 4.0 mm and unaffected ones, 1.3 mm.

The authors also mention, in the ultrasound signs of adhesive capsulitis, a “pseudo-double” tendon appearance of the long head of the biceps brachii tendon (LHBT) at the level of the pulley in 43 of the 106 patients, with a corresponding image (Fig. 6). Based on the pseudo-double tendon appearance of the LHBT, the tendon would be the coracohumeral ligament (CHL) if it was lateral to the biceps tendon and the superior glenohumeral ligament (SGHL) if it was medial.

Firstly, the ultrasound image presented in Fig. 6 is at the level of the bicipital groove, with the greater and lesser tuberosities well visible, and not at the more proximal biceps pulley, also known as biceps sling. An ultrasound scanning technique for the coracohumeral ligament at the rotator interval has previously been described [3]. To our knowledge, no description of the coracohumeral ligament or the superior glenohumeral ligament within the bicipital groove has been made so far, despite numerous cadaveric [4, 5] and imaging studies [6–8].

A detailed look at the transverse humeral ligament taken on 13 cadavers by Snow et al. in 2013 demonstrated that on top of being an innervated distinct structure, the transverse

M. Boudier-Revéret
Department of Physical Medicine and
Rehabilitation, Centre Hospitalier de L'Université de
Montréal, Montreal, QC, Canada

M.-Y. Hsiao
Department of Physical Medicine and
Rehabilitation, College of Medicine, National
Taiwan University, Taipei, Taiwan

M.-Y. Hsiao
Department of Physical Medicine and
Rehabilitation, National Taiwan University
Hospital, Taipei, Taiwan

M. C. Chang (✉)
Department of Rehabilitation Medicine, College of
Medicine, Yeungnam University, 317-1,
Daemyungdong, Namku, Daegu 705-717, Republic
of Korea
e-mail: wheel633@gmail.com

humeral ligament was continuous with the rotator cuff tendons and the coracohumeral ligament [9]. However, this did not result in an additional bundle-like structure.

The presence of a second oval or circular shaped structure at the level of the bicipital groove should suggest either a bifurcate biceps brachii tendon [10–12] or an aponeurotic expansion of the supraspinatus tendon [13, 14]. Bergman et al. estimated the existence of one or more additional heads of the long head of biceps to be up to 20% [15]. Moser et al. estimated at 49% the prevalence of an aponeurotic expansion of the supraspinatus in their retrospective review of 150 consecutive shoulder magnetic resonance imaging (MRI) studies. [13]

If that “pseudo-double” tendon was at the level of the rotator interval where the biceps pulley is visible on ultrasound, either an anisotropy artifact of the CHL or SGHL could account for a 2nd structure adjacent to the LHBT, and an aponeurotic expansion of the supraspinatus would be in the differential diagnosis.

If the structure is indeed more distal as shown in Fig. 6, at the level of the bicipital groove, then the most likely diagnoses are an aponeurotic expansion of the supraspinatus or a bifurcate biceps brachii tendon, and not CHL or SGHL. If some of the 43 patients in which the pseudo-double tendon was seen also had an MRI, a post hoc analysis of these exams would be helpful in sorting this question out.

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