

# A Female Laborer with Right Anterior Shoulder Pain

Ronald Christopher A. Cua<sup>1</sup>, Ming Yen Hsiao<sup>2\*</sup>

<sup>1</sup>Department of Physical Medicine and Rehabilitation, University of Santo Tomas Hospital, 1008 Metro Manila, Philippines, <sup>2</sup>Departments of Physical Medicine and Rehabilitation, College of Medicine, National Taiwan University Hospital, National Taiwan University, Taipei, Taiwan

## SECTION 2 – ANSWER

### Interpretation

The long head of the biceps tendon (LHBT) normally appears ovoid shaped, hyperechoic, and lies deep inside the bicipital groove bounded by the greater tuberosity laterally and lesser tuberosity medially. In the patient, the tendon (arrow) is displaced medially out of the bicipital groove, lying over the lesser tuberosity. It appears elongated and flattened because of the displacement of the proximal end of the tendon, making it course obliquely in a superomedial to inferolateral orientation. The transverse humeral ligament (THL, arrowheads), a hyperechoic fibrillar structure which overlies LHBT between the greater and the lesser tuberosities, also appears partially disrupted at the medial portion near the lesser tuberosity [Figure 1a].

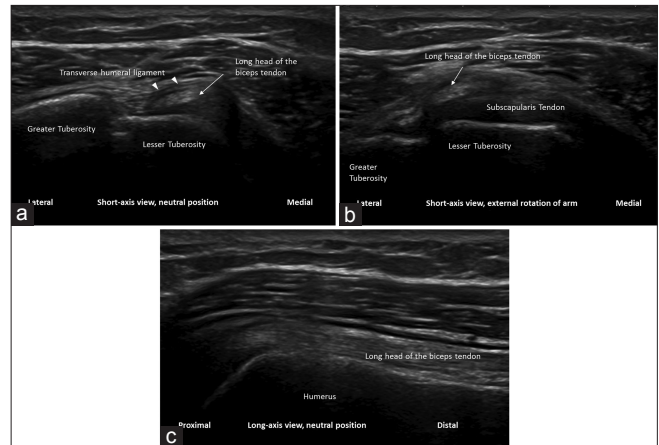
The second image was done with the patient's arm in external rotation. The ovoid hyperechoic tendon is displaced further medially, lying over the distal portion of the subscapularis tendon near its insertion. The thickness and the fibrillar pattern of the underlying subscapularis tendon seems to be intact in this view, but a more complete examination of the subscapularis tendon is needed to further evaluate its patency [Figure 1b].

The sonographic diagnosis for this patient would be medial dislocation of LHBT with disruption of THL.

## DISCUSSION

### Anatomy

LHBT originates from the supraglenoid tubercle and the posterior-superior labrum. The tendon traverses the rotator cuff interval as it makes its way down to the bicipital groove. The intra-articular portion of LHBT is stabilized by the coracohumeral ligament (CHL), the superior border of the subscapularis, and the superior glenohumeral ligament (SGHL) at the rotator cuff interval.



**Figure 1:** Sonographic images of the long head of the biceps tendon of the painful shoulder in (a) neutral position, short-axis, (b) external rotation of the arm, short-axis, and (c) long-axis view


THL, which covers LHBT at the bicipital groove, arises from the distal anterior roof of the rotator cuff interval.<sup>[1]</sup> Figure 1c showed the long-axis view of LHBT. Its role is still unclear, and many believe that it does not contribute to LHBT stability.<sup>[2]</sup> It may, however, be used as a landmark which can be visualized at the bicipital groove during ultrasound examination.

CHL and SGHL comprise the biceps pulley sling and heavily contribute to biceps tendon stability. Therefore, injury to any of the above-said structures may cause LHBT displacement or instability.<sup>[2,3]</sup> The patient did not present associated injuries other than a torn THL, but it should be noted that it is difficult to confirm tear of SGHL sonographically.

Instability of LHBT can be brought about by acute trauma, repetitive microtrauma, and degeneration.<sup>[3]</sup> A concomitant

**Address for correspondence:** Dr. Ming Yen Hsiao, Departments of Physical Medicine and Rehabilitation, College of Medicine, National Taiwan University Hospital, National Taiwan University, Taipei, Taiwan. E-mail: myferrant@gmail.com

Received: 27-02-2018 Accepted: 06-06-2018 Available Online: 14-12-2018

Access this article online	
Quick Response Code:	Website: www.jmuonline.org
	DOI: 10.4103/JMU.JMU_37_18

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

**How to cite this article:** Cua RC, Hsiao MY. A female laborer with right anterior shoulder pain. J Med Ultrasound 2018;26:229-30.

injury to the rotator cuff tendons would also increase the anterior translation of the humeral head in relation to the glenoid fossa, subjecting LHBT to overuse injury, displacement, and inflammation.<sup>[4]</sup>

### Diagnosis

LHBT dysfunction would usually present with nonspecific symptoms such as anterior shoulder pain which may radiate down the arm. Isolating LHBT dysfunction in the presence of concomitant rotator cuff disorders through physical examination alone is difficult, and hence, diagnostic ancillary procedures are important.<sup>[5]</sup>

Musculoskeletal ultrasound is an inexpensive and readily available diagnostic modality which can help in diagnosing LHBT injuries. Dynamic assessment helps improve its ability in determining the location of the tendon. Ultrasound is 100% specific and 96% sensitive for diagnosing LHBT instability.<sup>[6]</sup> It can reliably detect complete rupture and dislocation of the tendon, but it poorly detects partial thickness tears. It is important to know that normal sonographic findings do not guarantee a normal tendon anatomy.<sup>[7]</sup>

### Classification

Ultrasound examination of LHBT instability can be classified as subluxation or dislocation. Subluxation is a partial or transient loss of contact between the tendon and the bicipital groove.<sup>[8]</sup> Only a part of the tendon is displaced and is visualized outside the bicipital groove. In LHBT dislocation, the entire tendon lies outside the groove.<sup>[9]</sup> The direction of LHBT displacement in the setting of a biceps pulley sling dysfunction may depend on the integrity of the subscapularis and supraspinatus tendons.

### Treatment

Treatment of LHBT displacement would depend on the degree of impairment and severity of symptoms. Conservative treatment through activity modification, physical therapy, anti-inflammatory medications, and tendon sheath steroid injections may be done.<sup>[7]</sup>

In severe cases, invasive procedures such as LHBT tenotomy, tenodesis, and relocation with reconstruction of the pulley could be attempted.<sup>[5,10]</sup>

## CONCLUSION

Musculoskeletal ultrasound is an accurate and readily available tool for assessing LHBT instability, which is a common cause of anterior shoulder pain. CHL and SGHL comprise the biceps pulley sling proximally and heavily contribute to biceps tendon stability. THL forms the superior boundary of the bicipital groove distally. A thorough examination of the rotator cuff interval, as well as subscapularis and supraspinatus tendons, is essential to clarify the etiology.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

## REFERENCES

1. Tamborrini G, Möller I, Bong D, Miguel M, Marx C, Müller AM, *et al.* The rotator interval – A link between anatomy and ultrasound. *Ultrasound Int Open* 2017;3:E107-16.
2. Nakata W, Katou S, Fujita A, Nakata M, Lefor AT, Sugimoto H, *et al.* Biceps pulley: Normal anatomy and associated lesions at MR arthrography. *Radiographics* 2011;31:791-810.
3. Schaeffeler C, Waldt S, Holzapfel K, Kirchhoff C, Jungmann PM, Wolf P, *et al.* Lesions of the biceps pulley: Diagnostic accuracy of MR arthrography of the shoulder and evaluation of previously described and new diagnostic signs. *Radiology* 2012;264:504-13.
4. Chang KV, Chen WS, Wang TG, Hung CY, Chien KL. Quantitative ultrasound facilitates the exploration of morphological association of the long head biceps tendon with supraspinatus tendon full thickness tear. *PLoS One* 2014;9:e113803.
5. Virk MS, Cole BJ. Proximal biceps tendon and rotator cuff tears. *Clin Sports Med* 2016;35:153-61.
6. Armstrong A, Teefey SA, Wu T, Clark AM, Middleton WD, Yamaguchi K, *et al.* The efficacy of ultrasound in the diagnosis of long head of the biceps tendon pathology. *J Shoulder Elbow Surg* 2006;15:7-11.
7. Khazzam M, George MS, Churchill RS, Kuhn JE. Disorders of the long head of biceps tendon. *J Shoulder Elbow Surg* 2012;21:136-45.
8. Ahrens PM, Boileau P. The long head of biceps and associated tendinopathy. *J Bone Joint Surg Br* 2007;89:1001-9.
9. Ptaznik R. Sonography of the shoulder. In: Van Holsbeck MT, Introcaso JH, editors. *Musculoskeletal Ultrasound*. 2<sup>nd</sup> ed. St Louis: Mosby; 2001. p. 463-516.
10. McClelland D, Bell SN, O'Leary S. Relocation of a dislocated long head of biceps tendon is no better than biceps tenodesis. *Acta Orthop Belg* 2009;75:595-8.