



# Biceps Tendon Rupture Diagnosed by Physical Examination and Bedside Ultrasonography in the Emergency Department

## Acil Serviste İnceleme ve Ultrasonografi ile Tanı; Biceps Tendon Ruptürü

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### ABSTRACT

**Introduction:** A complete tear of the proximal long head of biceps tendon is a rare clinical condition that is caused by direct or indirect trauma. We report the case of a patient with a proximal long-head biceps (PLHB) rupture diagnosed by bedside ultrasonography (BUS) and physical examination in the emergency department (ED).

**Case Report:** A 55-year-old, right-handed man presented to ED with pain in the right shoulder and weakness in the elbow. Two days before, while he was lifting a 5-kg object from the ground, he felt a sudden pain, a burning sensation, and an audible pop in his right shoulder. On physical examination, there was a severe pain and tenderness over the anterior aspect of the shoulder, proximal part of the biceps muscle, and distally located biceps muscle mass. An emergency medicine physician performed BUS with a 7.5- to 12- MHz linear transducer. In BUS, there was a hypoechoic area in the right shoulder bicipital groove, but there were no tendon fibers. The evaluation of both the physical examination and sonographic findings revealed a PLHB rupture.

**Conclusion:** BUS is a fast and cost-effective imaging method for the diagnosis of PLHB total rupture in ED.

**Keywords:** Biceps, ultrasound, tendon rupture

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### ÖZET

**Giriş:** Biceps proksimal uzun tendon (PBUT) rüptürü direk ve indirek travma sonrası görülen nadir bir klinik tablodur. Bu yazıda acil serviste fizik muayene ve yatak başı ultrasonografi (USG) ile tanı koyulan bir PBUT rüptürü olgusu sunuldu.

**Olgu Sunumu:** 55 yaşında sağ elini kullanan bir erkek hasta acil servise sağ omuzda ağrı ve dirseği bükmede güçsüzlük şikayeti ile başvurdu. Öyküsünde 2 gün önce yerden yaklaşık 5 kg'lık bir ağırlığı kaldırırken sağ omuzda ani ağrı, yanma hissi ve çarpma sesi meydana geldiği öğrenildi. Fizik muayenede palpasyonla sağ omuz anteriorda ağrı ve hassasiyet dirsek fleksiyonunda distal yerleşimli biceps kası kitlesi tespit edildi. Acil servis hekimi tarafından 7.5-12 MHz linear prob ile yapılan yatak başı USG'de sağ omuz bicipital olukta tendon liflerinin olmadığı bir hipoekoik alan görüntülendi. Fizik muayene ve USG bulguları ile hastaya PBUT rüptür tanısı konuldu.

**Sonuç:** Acil servislerde PBUT total rüptür tanısında yatak başı USG hızlı, yeterli ve ucuz bir tanı yöntemidir.

**Anahtar Kelimeler:** Biceps, ultrasonografi, tendon rüptürü

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### Introduction

Proximal biceps tendon rupture comprises approximately 95% of all biceps ruptures (1). Tendon rupture usually takes place during activity, and some patients feel sudden sharp pain, a burning sensation, and an audible pop in the anterior aspect of the shoulder. Although biceps rupture occurs over a wide age range, it is more frequently seen in the fourth, fifth, and sixth decades of life because of direct or indirect trauma or chronic inflammation (2, 3). In this paper, we report the case of a patient with a proximal long-head biceps (PLHB) rupture diagnosed by bedside ultrasonography (BUS) and physical examination in the emergency department (ED).

### Case Report

A 55-year-old, right-handed man presented to ED with pain in the right shoulder and weakness in the elbow. Two days before, while he was lifting a 5-kg object from the ground, he felt a sudden pain, a burning sensation, and an audible pop in his right

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**Figure 1.** a-c. Difference between the two biceps (a), the deformity on the right biceps (b), the transverse aspect of the bicipital groove; hypoechoic bicipital groove because of fluid accumulation, and there are no tendon fibers (red arrow) (c). H: humeral head; GT: greater tuberosity; LT: lesser tuberosity

shoulder. The patient was previously healthy and had no chronic disease and no trauma or injuries to the shoulder. He denied drinking alcohol and using illegal drugs and medications including steroid, but he accepted smoking for 30 pack years. On physical examination, there was a severe pain and tenderness over the anterior aspect of the shoulder, proximal part of the biceps muscle, and distally located biceps muscle mass (Figure 1a, b). The right elbow active and passive range of motion was full, but there was a mild weakness with 4 of 5 powers in manual testing during elbow flexion and supination. Neurovascular examination and conventional radiographic imaging findings were normal. An emergency medicine physician

performed BUS (LOGIQ C5 Premium; GE Medical System, China) with a 7.5- to 12-MHz linear transducer. BUS was performed while the patient was sitting, and his hand was positioned palm upward on the knee. The linear transducer was placed on the right bicipital area, and longitudinal–transverse scans were obtained. In BUS, there was a hypoechoic area in the right shoulder bicipital groove, but there were no tendon fibers (Figure 1c). The evaluation of both the physical examination and sonographic findings revealed a PLHB rupture. The patient was discharged from ED with a conservative treatment recommendation after orthopedic evaluation. Elective magnetic resonance imaging (MRI) was planned for the definitive diagnosis. The patient underwent MRI after ED disposition, and the radiologist reported the MRI findings as a “long-head biceps tendon total rupture.” Written informed consent was taken from the patient for publishing this case report.

### Discussion

Long-head biceps tendon rupture often occurs in males between the ages of 40 and 60 years (2, 4). Sudden heavy lifting or loading can cause acute tendon rupture. Usually, PLHB ruptures occur while lifting a heavy object from ground until 90° elbow flexion. Tendon ruptures depend on trauma and may also spontaneously occur. Severe tendon degeneration in the elderly, smoking, rheumatoid arthritis, and some medications such as steroids, statins increase the possibility of spontaneous tendon rupture (4, 5).

In PLHB rupture, two treatment options, conservative or operative, are possible. The treatment option is decided according to the patient’s physical activity. Physical therapy recommended for individuals with a sedentary life style. Satisfactory results are obtained in most of the conservative treatment options (6).

Ultrasonography (US) has been used for trauma patients since 1980 (7). Because of the progress in US and the increasing experience, the quality of patient care improved using BUS in EDs (8). Extremity trauma is one of the most common reasons for admission to ED, and musculoskeletal US is widely used by emergency medicine physicians because of real-time dynamic imaging, in addition to it being fast and cost-effective. BUS is also a successful method for the evaluation of tendon injuries (9). Some of the sonographic findings of PLHB rupture are the absence of a fibrillar structure of the tendon in the bicipital and hypoechoic bicipital grooves because of fluid accumulation (10). We diagnosed a PLHB tendon total rupture in our patient with shoulder pain and a distally located biceps mass.

### Conclusion

BUS is a fast and cost-effective imaging method for the diagnosis of PLHB total rupture in ED.

**Informed Consent:** Written informed consent was obtained from patient who participated in this case.

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