

Incidental detection of congenital absence of the long head of the biceps tendon during shoulder arthroscopy: A case report

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ABSTRACT

Although congenital variations of the biceps brachii are relatively common, agenesis of the long head is exceedingly rare. Due to the absence of clinical symptoms and notable physical examination findings, its diagnosis is challenging. The absence of the long head represents one such variant, although it has only rarely been reported in arthroscopic and imaging studies. As this anomaly does not result in functional impairment, congenital biceps agenesis is often incidentally detected on shoulder magnetic resonance imaging performed for other reasons. In this case report, we present a 42-year-old industrial worker with a two-year history of persistent pain who underwent rotator cuff repair, during which an absent long head of the biceps tendon was incidentally identified. Current evidence suggests that the absence of the long head of the biceps tendon is not a risk factor for rotator cuff rupture or labral pathology. Additionally, when evaluating patients with an absent long head of the biceps tendon, it is essential to consider any previous surgical interventions. If the long head cannot be identified, the distal portion of the tendon should be carefully assessed, as the most common cause of its absence near the shoulder is not a congenital condition but rather a complete tear causing the tendon to retract downward. This condition represents an incidental anatomical variation and does not contribute to the functional impairment observed in these conditions.

Keywords: Agenesis; arthroscopy; biceps; tendon; shoulder.

INTRODUCTION

The biceps brachii is a two-headed muscle consisting of a short head and a long head that spans two joints. The long head originates from the supraglenoid tubercle, while the short head originates from the coracoid process, with its distal attachment at the radial tuberosity. Functioning as a powerful supinator and flexor of the elbow, the biceps also plays an important role in stabilizing the shoulder—particularly during abduction and internal rotation.^[1] Congenital variations of the long head of the biceps tendon (LHBT) were once thought to be extremely rare;^[2,3] however, advancements in magnetic resonance imaging (MRI) and arthroscopy have significantly increased both the detection rate and the recognized diversity of LHBT variations. The absence of the

LHBT represents one such variant, although it has only rarely been reported in arthroscopic and imaging studies.^[4]

Owing to its rarity, lack of awareness, variable clinical presentation, absence of specific clinical signs, and the limitations of conventional MRI, clinical diagnosis remains extremely challenging, if not impossible.^[5] Moreover, congenital absence of the LHBT is rare, and its prevalence is unknown. Reports describing bilateral absence of the LHBT are also limited.^[6] In this case report, we present the arthroscopic findings of a patient who presented with shoulder pain and was found to have an absent left LHBT during rotator cuff surgery.

CASE REPORT

A 42-year-old male industrial worker presented to the or-

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thopedic outpatient clinic with a two-year history of gradually worsening shoulder pain. On physical examination, Jobe's, Neer, and Hawkins tests were positive, while upper extremity strength was 5/5. The patient's shoulder exhibited no signs of laxity or hypermobility, and the "Popeye" sign was absent. Additionally, both the O'Brien and Speed tests were negative, with no clinical or physical evidence suggesting biceps pathology. With a preliminary diagnosis of a rotator cuff tear and impingement, radiographs and an MRI were obtained. MRI evaluation revealed an empty bicipital groove (Fig. 1) and a partial tear of the supraspinatus tendon. In the absence of a Popeye sign and any history of trauma, the finding was interpreted as agenesis rather than rupture of the biceps tendon. Because the patient's symptoms persisted despite physical therapy for the partial supraspinatus tear, shoulder arthroscopy was subsequently recommended. Intraoperatively, examination confirmed that the supraglenoid area was completely bare, with no identifiable LHBT—findings consistent with biceps agenesis (Fig. 2). The labrum was intact, and no intraoperative instability was observed. The rotator cuff tear was successfully repaired using a double-row technique.

DISCUSSION

Initially, Diplock et al.^[7] argued that the LHBT was a function-

ally insignificant vestigial structure. However, current evidence indicates that the LHBT plays a crucial role as a dynamic stabilizer of the shoulder by depressing the humeral head and elevating the superior glenoid labrum.^[8] Congenital absence of the LHBT is a rare anomaly, with unilateral absence associated with other skeletal and extraskelatal congenital anomalies in 57% of cases.^[9] In 1997, Mariani et al.^[10] published the first case report documenting arthroscopic absence of the LHBT in a patient with no history of trauma. Since then, numerous case reports and case series have documented the absence of the LHBT.^[11] Shoulder arthroscopy is the most reliable method for establishing a definitive diagnosis. Its key diagnostic feature is the failure to identify the intra-articular portion of the LHBT in the presence of a shallow or absent bicipital groove.^[2] The present case represents the first reported instance of biceps agenesis encountered in a patient undergoing rotator cuff repair. In 2009, Dierickx introduced a comprehensive classification of congenital anatomical variations of the LHBT. This classification delineates three possible pathoanatomical variants observable on shoulder arthroscopy and MRI in cases of LHBT absence: the absent type (ABS), the adherent type to the capsule-labrum complex (ADH-CL), and the adherent type confluent with the rotator cuff (ADH-CO) types. The ABS variant is characterized by the complete absence of both the intra-articular and extra-articular portions of the LHBT.

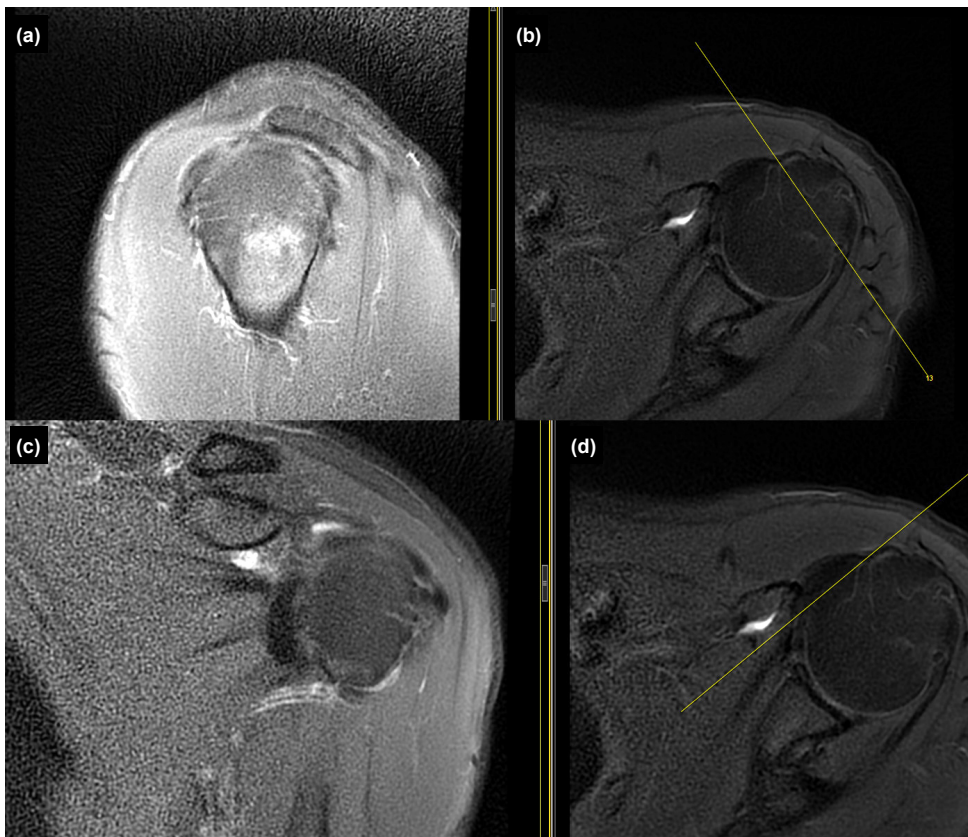


Figure 1. Axial, coronal, and sagittal magnetic resonance imaging (MRI) sections demonstrating the absence of the intra-articular portion of the long head of the biceps tendon.

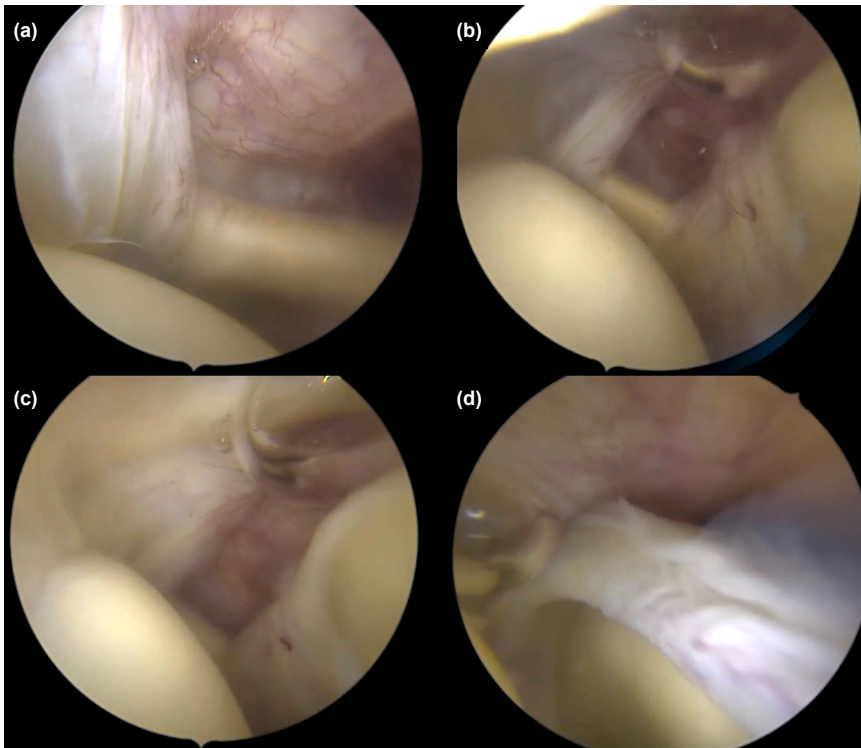


Figure 2. Arthroscopic views of the right shoulder demonstrating the absence of the long head of the biceps tendon (LHBT). (a) The subscapularis tendon is visualized together with the absent bicipital groove. (b) The subscapularis tendon, superior glenoid, and humeral head are visualized, with no identifiable LHBT. (c) A distant view of the subscapularis, superior glenoid, and humeral head again demonstrating the absence of the LHBT. (d) The normal attachment site of the LHBT on the superior glenoid is empty, while the superior labrum appears intact without disruption.

In the ADH-CL variant, the LHBT normally attaches to the labrum or supraglenoid tubercle but adheres to the inferior surface of the tendon (i.e., fixed at one end). In the ADH-CO variant, the LHBT is completely confluent with the cuff without distinct fixed ends.^[5] The current case represents an ABS-type biceps agenesis, with no evidence of attachment to either the labrum or the supraglenoid area.

It is important to assess the distal portion of the tendon if the LHBT cannot be identified, as the most common cause of its absence near the shoulder is not a congenital condition but a complete tear causing the tendon to retract downward.^[12] A full-thickness tear of the tendon may produce a visible “Popeye” sign on examination, presenting as a soft-tissue bulge due to downward displacement of the biceps muscle after detachment and disruption of normal tension within the tendon.^[9] Additionally, when evaluating patients with an absent LHBT, it is essential to consider any previous surgical interventions (e.g., tenotomy or tenodesis).

CONCLUSION

In conclusion, current evidence suggests that the absence of the LHBT is not a predisposing factor for rotator cuff tears or labral pathology. Rather, it is an incidental anatomical varia-

tion that does not contribute to the functional impairment observed in these conditions.

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OLGU SUNUMU - ÖZ

Omuz artroskopisi sırasında tesadüfen saptanan biceps tendonunun uzun başının konjenital yokluğu: Bir olgu sunumu

Biceps brakii kasının konjenital varyasyonları nispeten yaygın olmakla birlikte, biceps brakii kasının uzun başın agenezisi son derece nadir görülen bir durumdur. Klinik semptomların ve belirgin fizik muayene bulgularının bulunmaması nedeniyle tanı koymak oldukça zordur. Biceps brakii kasının uzun baş tendonunun yokluğu, bu varyasyonlardan biridir ve artroskopik ya da görüntüleme çalışmalarında nadiren bildirilmiştir. Fonksiyonel bir bozukluğa yol açmadığı için, konjenital biceps tendon agenezisi genellikle başka nedenlerle yapılan omuz manyetik rezonans görüntülemeleri sırasında tesadüfen saptanır. Bu olgu sunumunda, iki yıldır devam eden omuz ağrısı olan 42 yaşındaki bir endüstri işçisinde yapılan fizik muayenede biceps tendonu ile ilişkili muayene bulguları negatifti. Artroskopik rotator manşet onarımı sırasında, biceps tendonunun uzun başının yokluğu tesadüfen belirlenmiştir. Güncel literatür, bicepsin uzun baş tendonunun yokluğunun, rotator manşet yırtığı veya labral patoloji açısından bir risk faktörü oluşturmadığını göstermektedir. Bicepsin uzun başı olmayan hastalar değerlendirilirken, daha önce geçirilmiş cerrahi girişimlerin (örneğin tenotomi veya tenodes) mutlaka göz önünde bulundurulması gerekmektedir. Eğer tendonun uzun başı tespit edilemiyorsa, distal kısmı mutlaka değerlendirilmelidir; çünkü omuz çevresindeki yokluğun en yaygın nedeni konjenital agenezis değil, tendonda oluşan tam kat yırtık sonrası aşağıya doğru retraksiyondur. Bu durum, ilgili klinik tabloya katkıda bulunmayan, tesadüfi bir anatomik varyasyon olarak kabul edilmektedir.

Anahtar sözcükler: Agenezis biceps; artroskopi; omuz; tendon.

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