

Anomalous origin of the long head of biceps in a patient with anterior shoulder instability and long-term results of its repair

Ankit Goyal¹, Dheren Mondal², Chetan Sharma³, Rakesh Goyal³, Pallav Mishra¹

From ¹Associate Professor; ²Fellow (FNBE); ³Senior Resident, Department of Sports Injury Centre, VMMC and Safdarjung Hospital, Delhi, India

ABSTRACT

The long head of the biceps tendon normally originates from the superior glenoid tubercle. There have been several descriptions of anomalous origins of the tendon of the biceps, but their clinical implications remain mostly unknown. They are mostly incidental findings during arthroscopic surgery and include aberrant origins and agenesis. Due to the rare nature of these lesions, it is unlikely that substantial sample size will be generated in the future to propose treatment recommendations. Nevertheless, shoulder arthroscopy surgeons should be aware of its potential to become pathologic and causing shoulder dysfunction. We are presenting a case of a young sports person who presented to us with a complaint of anterior instability and its long-term follow-up after repair. The anomalous origin of the biceps tendon was noted incidentally on arthroscopy while doing the repair though the patient did not report any pain due to the same both preoperatively and after surgery.

Keywords: Anomalous origin, Long head of biceps, Shoulder instability

The long head of the biceps tendon (LHBT) is known to originate from the superior glenoid tubercle. After its origin, the LHBT traverses the glenohumeral joint (intra-articular part) and the intertubercular sulcus (extra-articular part) before becoming a musculotendinous structure. However, a number of authors have reported substantial variations in its origin [1-4]. During normal embryo development, the tendon of the biceps develops from the shoulder capsule and can be found as an independent structure in fetuses aged around 9 weeks.

Interruptions to the development or abnormalities over its course may result in variations from the normal anatomy [5]. There have been several descriptions of anomalous origins of the tendon of the biceps, but their clinical implications remain mostly unknown. These reports come from the incidental findings during arthroscopic surgery and include aberrant intra-articular origins, extra-articular origins, and agenesis [5-8]. The purpose of this article is to report an anomalous origin of the long head of biceps over supraspinatus tendon associated with Bankart lesion and a non-engaging Hill-Sachs lesion.


CASE REPORT

A 17-year-old, right hand dominant, female basketball player presented with a complaint of recurrent dislocation of the

right shoulder. The patient had a history of recurrent shoulder dislocation for the past 11 months. The patient had three episodes of dislocation in the past 11 months but the dislocation never happened during sleep duration.

On examination, the patient was conscious, well-oriented to time/place/person, no pallor, lymphadenopathy, cyanosis, or clubbing. The patient had normal cardiovascular, abdominal, and respiratory examination and the vitals of patient were within normal limits. While on local examination, there was no atrophy noted in the upper extremity or about the shoulder. There was a full symmetric range of motion of both the upper extremities. Strength was normal bilaterally, especially resisted shoulder abduction and external rotation, as well as, elbow flexion and supination. The apprehension test was positive for both pain and apprehension. The internal impingement test was negative. Both the O'Brien test and the Speed test were negative. There was no sign of ligamentous laxity.

Magnetic resonance imaging of the right shoulder was performed which showed a soft-tissue Bankart lesion with Hill-Sachs lesion and no other lesion was seen. Arthroscopic examination performed in the lateral arthroscopy position showed the anomalous origin of the long head of biceps over the supraspinatus tendon (Fig. 1). The patient had a Bankart lesion and a non-engaging Hill-Sachs lesion appreciable on dynamic testing, that is, on releasing lateral traction and taking the limb in abduction and external rotation.

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Correspondence to: Dr Ankit Goyal, E-2/8 Vasant Vihar, New Delhi - 110 057, India. E-mail: ankit.ortho@gmail.com

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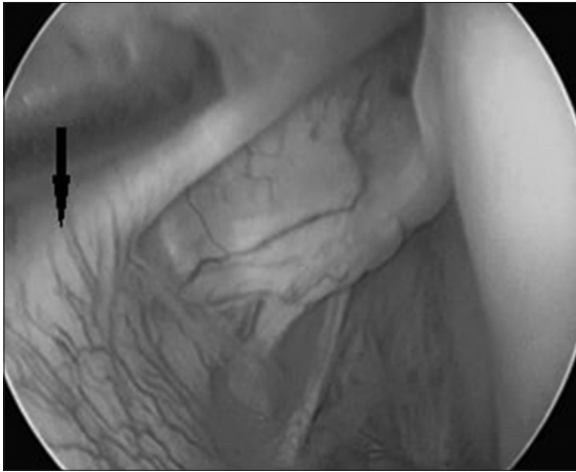


Figure 1: Intraoperative arthroscopic image of the shoulder joint showing the origin (black arrow) of the long head of the biceps tendon from the supraspinatus tendon as seen through the posterior viewing portal

The patient underwent arthroscopic repair using three titanium 2.8 mm suture anchors. The patient was able to return to her sports, that is, basketball after 9 months by going through proper guided rehabilitation by our team. Functional scores improved significantly; Rowe scores improved from 33 preoperatively to 97 after 5 years of surgery. The University of California, Los Angeles (UCLA) scores improved from 16 preoperatively to 34 during this period and the Western Ontario Shoulder Instability (WOSI) index score decreased from 52% to 4%. Written informed consent was taken from the patient.

DISCUSSION

The classical origin of the long head of the biceps brachii is the supraglenoid tubercle. About 50% of biceps tendons are attached to the superior glenoid labrum, and the remainders are attached to the supraglenoid tubercle [9]. Testut and Latarjet described three possibilities for the relationship between the biceps and the joint capsule: Completely free, related to it through a mesentery, or attached to it [10]. Audenaert *et al.* had revived this theory by concerning the migration of LHBT to explain all these variants [5]. Some authors, mostly in single case reports, have reported that aberrant origin of the LHBTs may be causally related to a number of conditions such as rotator cuff degeneration, instability, impingement, chronic pain, and acromioclavicular arthritis [1,4,11,12].

Richards *et al.* highlighted the importance of awareness of anatomical variants of the intra-articular portion of LHBT to avoid misdiagnosis and unnecessary treatment [3]. Enad recognized this anatomic variant at arthroscopy and described it can aid shoulder surgeons in focusing treatment of actual pathology and not on aberrant anatomy [6]. According to Vangsnes *et al.*, anatomical variations of the origin of LHBT are significant for arthroscopic diagnosis and may help to explain the various patterns of injury in partial and complete detachment of the tendon, the labrum, or both [9].

There is a consistent association between the congenital absence of the long head of the biceps and glenohumeral instability, and studies have shown that the long head of the biceps has a stabilizing role [2,12,13]. Specifically, the long head of the biceps acts as a depressor of the head of the humerus and a dynamic stabilizer for the glenohumeral joint.

Gaskin *et al.* stated the possibility of increased risk of developing shoulder instability in patients with this anomaly [11]. Kanatli *et al.*, in a series of 50 patients, with LHB anomalies, reported a significantly higher incidence of superior labral and Bankart's lesions in patients with these anatomical variations compared with a population who did have this aberration (32% vs. 13%; $p < 0.001$) [14]. However, Kim *et al.* acknowledged that recognizing insertional abnormalities in the biceps tendon are important since it can be a source of shoulder pain either alone or in combination [8].

Our case report and most other published reports on cases of abnormal intra-articular origins for the long head of the biceps suggest that these anatomical variations are benign, without any evidence that these findings are pathological. In this report on a rare case, we found a different anatomical origin for the long head of the biceps, in which it originated over the supraspinatus tendon, without originating in the supraglenoid tubercle or in the upper labrum and is associated with Bankart lesion along with a non-engaging Hill-Sachs lesion which we repaired arthroscopically after which the patient returned to her sports after proper rehabilitation and we found improved functional (Rowe, UCLA, WOSI) scores.

CONCLUSION

Since there are very few cases of anomalous origin of the long head of biceps from the rotator cuff reported in the literature and still fewer cases, reported clinical symptoms attributed to this anomaly, definite conclusions about its pathologic nature are difficult to construe. Due to the rare nature of these lesions, it is unlikely that substantial sample size will be generated in the future to propose treatment recommendations. Nevertheless, shoulder arthroscopy surgeons should be aware of its potential to become pathologic and causing shoulder dysfunction. In addition, one important clinical conclusion could be that surgeons should be aware of this condition and not misinterpret it as a pathology requiring surgical manipulation.

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