VARIATION IN THE ORIGIN OF BICEPS BRACHII MUSCLE

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ABSTRACT

BACKGROUND
Extracapsular origin of long head of biceps brachii was found during routine dissection in a male cadaver of 70 years of age. Long head of biceps brachii was seen originating from below the lesser tubercle below the anatomical neck and outside attachment of capsular ligament. Recognition of the described anatomic variant of the biceps tendon can aid the surgeon in focusing the treatment on the actual pathology and not on aberrant anatomy. We are reporting the observation that the long head of the biceps tendon may be incorporated in the extra-articular side of the glenohumeral joint capsule, making arthroscopic visualisation and assessment of the tendon difficult.

KEYWORDS
Biceps Brachii, Shoulder Joint Capsule, Variation, Long Head, Extra-Capsular, Extra-Articular.


BACKGROUND
Biceps Brachii Muscle (BBM) is one of the muscle of the anterior compartment of the arm. It is one of the most variable muscles in the human body in terms of number and morphology.1-2 Most of the variations of this muscle lies in its proximal attachment part. Amongst the supernumerary heads of BBM reported is the presence of 3 to 7 heads.3-4 The absence of the long or the short head of BBM5 and variation in its insertions5-6 have also been reported. Knowledge of this variant may be relevant for both the glenohumeral surgery and shoulder joint arthroscopy, as biceps tendon is the first reference structure to be seen during arthroscopic exploration using posterior approach.7 In our case report, we are presenting a case of extracapsular origin of biceps brachii muscle found in right arm of a 70-year-old male cadaver.

CASE REPORT
During a supervised dissection of a 70-year-old male formalin fixed West Maharashtrian cadaver by the medical students of the Department of Anatomy, Government Medical College, Miraj, Maharashtra, some variations in the proximal attachment of the BBM were noted. The dissection procedure was as directed in Cunningham’s Manual for dissection.8 Further dissection was carried out by the author and the variation was photographed and documented. The long head instead of arising intracapsularly from the glenoid labrum and supraglenoid tubercle of the humerus arose from the capsule of the shoulder joint (Figures 1 and 2). As the origin was extracapsular, the tendon of the long head was devoid of the double tubular sheath, an extension of the joint capsule’s synovial membrane. The tendon after arising from the capsule of the shoulder joint ran in the bicipital groove and then formed a muscle belly. The insertion and the nerve supply of the muscle were normal.

As seen in Figure 2, short head arose normally from tip of coracoid process. Articular surface of head of humerus was seen eroded indicating arthritic changes, which can be correlated with the age of cadaver. Both the heads fuse with each other at the normal level and belly of biceps formed and inserted in the usual manner as seen in Figure 3.
DISCUSSION
Capsular origin of the long head of biceps brachii is an extremely rare anomaly. Though no reports of the incidence of this variation could be found, a few authors have reported similar variation (Macalister, 1875; Egea, Melguizo, Prados et al 2010). Macalister (1875) also reported a long head attached to greater tuberosity. Bergman, Thompson and Afifi (2005) reported that the two heads of biceps brachii muscle may be totally separate or fused and either head may be absent. In the absence of long head, the tendon may be found arising from the bicipital groove, one of the tubercles of humerus, the capsule of the shoulder joint or the tendon of pectoralis major. Hyman and Warren (2001) too came across an extra-articular origin of the long head of biceps brachii.

Normally, the biceps tendon courses over the head of humerus to continue with the labrum, thus helping to retain the head in the glenoid fossa and assisting the rotator cuff. Subjects with the present variation may have weakening of the rotator cuff. Further, Egea, Melguizo, Prados et al (2010) said that long head of biceps tendon acts as a shoulder stabilizer and absence of the intra-articular part can lead to an instability which can allow the humeral head to damage the labrum and trap the cuff against the acromion resulting in fracture of the supraspinatus.

Such variant origin of the long head of biceps may also make arthroscopic visualisation and assessment of tendon difficult. Non-visualisation of the intra-articular part of long head of biceps tendon due to such a variation can be wrongly diagnosed as rupture of the tendon (Tuckman, 1994). Cheema P and Singla R also in 2010 found similar findings in their case report.

Thus, recognising abnormalities of the biceps tendon is important, because they are a common source of shoulder pain both alone and in combination with abnormalities of the rotator cuff, labrum and other structures. An incomplete/wrong diagnosis can lead to treatment failure, it is important to recognise this less common entity which can aid the surgeon in focusing the treatment on the actual pathology.

Hence, knowledge of the existence of this anatomic variant is necessary to avoid errors in shoulder arthroscopy, surgery and evaluation of MRI scans.

REFERENCES