CONSIDERATIONS ON GLENOID LABRUM INSERTION OF LONG HEAD OF BICEPS BRACHII MUSCLE

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CONSIDERATIONS ON GLENOID LABRUM INSERTION OF LONG HEAD OF BICEPS BRACHII MUSCLE (Abstract): Recent improvements in clinical imaging and shoulder arthroscopy techniques has led to an increasingly number of subtle pathologies of the glenohumeral joint; glenoid labrum and the insertion of long head of biceps brachii muscle are definitely involved. The authors have performed a descriptive anatomic study correlated to shoulder arthroscopy findings in order to present the morphology of the labrum insertion of long head of biceps brachii muscle. Clinical implications are discussed. Key words: SHOULDER, ARTHROSCOPY, LABRUM, BICEPS BRACHII MUSCLE.

The improvement in clinical imaging and the development of shoulder arthroscopy over the last years has allowed clinicians to diagnose and treat more subtle pathologies of the glenohumeral joint. Injuries to the labrum have been more recognized during this period, as a source of symptoms and the optimal treatment of these lesions is still evolving at a rapid pace.

The tendon of the long head of Biceps brachii muscle has been described in most anatomical texts as originating from the supraglenoid tubercle [10, 21, 9, 19, 8, 15, 16], other studies have however shown its additional attachment to glenoid labrum [5, 20, 18, 11, 12, 3]. The purpose of the present study was to define the extent of the labral attachment of the tendon of biceps brachii.

MATERIAL AND METHODS

We conducted our morphologic study into two directions: direct examination of labrum disposition and morphology during shoulder arthroscopy and anatomic description after dissection on human cadavers. We performed a total number of 53 shoulder arthroscopies in the orthopedic department of Saint Joseph Hospital in Arlon, Belgium and at Irina Medical Center in Craiova, Romania; all patients underwent an anterior and posterior arthroscopic approach for different shoulder pathologies (Bankart lesions, instability, SLAP lesions etc.). In our descriptive anatomy study, we used 21 shoulder joints from adult cadavers of both sexes, in the Human Anatomy Department of the University of Medicine and Pharmacy from Craiova. The joint cavity was exposed by a delto-pectoral approach. The long head of biceps was dissected and its attachment studied. In order to better present the results, the glenoid cavity was divided into three topographic parts: upper, middle and lower (14).

RESULTS

The biceps tendon was seen to arise from the supraglenoid tubercle and extended onto the glenoid labrum (both anteriorly and posteriorly) in all the specimens, although the extent of this labral attachment is variable (fig. 1 and 2). An anterior labral attachment was observed in 100% of the shoulder joints studied. Isolated posterior labral attachment was seen in 57% specimens. None of the specimens showed isolated anterior labral attachment. The anterior and posterior labral margins were examined to see how far the attachment extended i.e., upper, middle or lower third (tab. 1). The extension of attachment up to lower third of posterior glenoidal labrum has been rarely reported earlier (14).
TABLE 1
Labrum attachment of long head of biceps brachii muscle

<table>
<thead>
<tr>
<th>Labrum attachment</th>
<th>Upper third</th>
<th>Middle third</th>
<th>Lower third</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anterior</td>
<td>30%</td>
<td>3%</td>
<td>0%</td>
</tr>
<tr>
<td>Posterior</td>
<td>32%</td>
<td>36%</td>
<td>12%</td>
</tr>
</tbody>
</table>

DISCUSSION
The present study revealed that the tendon of long head of biceps brachii has a dual attachment to the supraglenoid tubercle as well as glenoid labrum which conforms to the arthroscopic analyses of Bankart (1980), Detrisac & Johnson (1986), Pal et al (1991) and Cooper et al (1992) [1, 4, 12, 3]. Anatomical variations in the labral attachment of the biceps tendon help us to explain the association of recurrent shoulder dislocation and labral detachment. This aids to understand that the maximum activity...
of long tendon of biceps is in the late phase of throwing when the shoulder is abducted and externally rotated \([7]\); also explains the higher biceps activity in pitchers with known anterior instability \([6]\), wherein the biceps force has been shown to increase the torsional rigidity of the glenohumeral joint by \(32\% \) \([17]\).

The biceps tendon courses over the head of the humerus to continue with the labrum, thus helping to retain the head in the glenoid fossa and assisting the “rotator cuff” \([14]\). Our study has demonstrated that in \(12\% \) of specimens the posterior labral attachment of the tendon extended up to the lower third of the glenoid cavity. This extensive attachment in the posterior glenoid labrum is expected to provide a better stability to the shoulder. Boyd & Sisk \([2]\) have made surgical use of this labral attachment in patients with detached posterior labrum by combining a posterior capsulorraphy with an elongation of the tendon by as much as \(1 \) cm to achieve this procedure due to the presence of its labral attachment.

**CONCLUSIONS**

The present study has successfully accomplished its purpose of demonstrating the variability of the labral attachment. In all specimens, the tendon extended posteriorly, mostly up to the middle third of the posterior glenoid margin. None of the specimens showed isolated anterior attachment. An understanding of the labral attachment of the long tendon of biceps brachii muscle plays an important role in the evaluation and surgical correction of labral pathology.

**REFERENCES**