

Surgical treatment of shoulder instability with trans-subscapularis transfer of the biceps long tendon.

Tratamento cirúrgico da instabilidade do ombro através da transferência do tendão longo do bíceps trans-subescapular.

Max Rogério Freitas Ramos¹; Yonder Archanjo Ching San-Júnior²; Luiz Henrique Pereira Alves³.

1. Federal University of the State of Rio de Janeiro, Department of Orthopedics and Traumatology, Rio de Janeiro, RJ, Brazil.
2. Federal University of the State of Rio de Janeiro, Post-graduate Program in Medicine, Rio de Janeiro, RJ, Brazil.
3. Federal University of the State of Rio de Janeiro, Department of Anatomy, Rio de Janeiro, RJ, Brazil.

ABSTRACT

Our objective is to describe the long biceps tendon transfer technique for the treatment of shoulder anterior instability. In this procedure, the long tendon of the biceps brachii is detached from the supraglenoid tubercle and transferred to the anterior edge of the glenoid cavity through a subscapularis tenotomy, reproducing the sling effect and increasing the anterior block. The technique is easy to perform and minimizes the risks of the coracoid process transfer. In conclusion, the transfer of the long tendon of the biceps brachii is an option for the treatment of glenohumeral instability.

Keywords: Shoulder Dislocation. Shoulder Joint. Joint Instability.

INTRODUCTION

The glenohumeral instability is a very prevalent entity in orthopedic clinics, which affects young people in their productive life, and impacts directly on the professional athlete's career or on the worker's labor capacity¹⁻³. There are several surgical techniques

to treat shoulder instability. The arthroscopic reconstruction of the labrum is the most widely used technique, but has a high recurrence rate in patients with bone loss greater than 25% in the anterior glenoid³⁻⁷. In these cases, the coracoid process transfer becomes the best option⁵⁻⁹. This technique, however, is not free of complications.

One of advantages of the coracoid process transfer is the tensioning of the subscapularis tendon by the conjoined tendon^{10,11}. This sling effect contributes to the stability of the humeral head movements of abduction and external rotation when tensioning the subscapularis tendon, causing it to act as an anterior block¹⁰⁻¹². Besides that, the positioning of the bony block at the anterior border of the glenoid cavity increases the bone contact during the anterior translation of the humeral head, ensuring greater bone contact and preventing dislocation^{7,9,10}.

The transfer of the biceps tendon long branch through the subscapularis tendon and its tenodesis in the anterior edge of the glenoid cavity next to the labral repair reproduce this tensioning effect of the subscapularis and allow previous contact through the thickening of soft tissues (augmentation) (Figure 1)¹¹⁻¹³. Our objective is to describe, in a cadaver, the biceps long tendon transfer technique for the treatment of anterior shoulder instability.

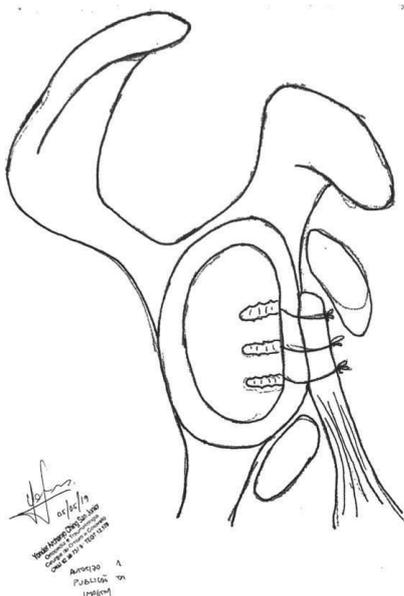


Figure 1. Tendon transfer through the longitudinal tenotomy of the subscapularis and inserted in the anterior border of the glenoid cavity.

TECHNICAL NOTE

The study was approved by the Ethics in Research Committee of the Federal University of the State of Rio de Janeiro (protocol n^o 77773617.4.0000.5258). We placed

the corpse in lateral decubitus position, with the upper limb abducted by 30°. We identified the posterior angle of the acromium. The posterior portal was established 2cm lower and 2cm medial to the vertex of the posterior angle. Through the posterior portal, we performed the arthroscopic inspection of the joint with the Smith&NephewR equipment (direct vision arthroscope 4.0x160.0mm 30°, Smith&NephewR 560H camera; GerminiR fiber optic cable 5mm).

Once the joint was inspected, the anterior portal was demarcated by inserting a Jelco #14 needle (outside-in) so that it was located in the rotator gap, between the subscapular tendon and the long head of the biceps tendon. Next, a needle was introduced at the apex of the anterior axillary fold and, under direct vision, the needle was passed laterally to the conjoined tendon and superior to the subscapularis. We placed the needle on the glenoid neck at the graft site, and made a 2cm incision in the skin. We guided the anterolateral portal by the upper edge of the subscapularis tendon.

Through the anterior portal, we performed tenotomy of the long biceps tendon in its insertion in the supraglenoid tubercle (Figure 2). We then displaced the tendon from the bicipital groove at the humeral head through the anterolateral portal and transferred it to the extra-articular medium.



Figure 2. Tenotomy of the intra-articular portion of the bicipital tendon.

We transferred the arthroscope to the antero-lateral portal. Through the anterior portal, we performed the longitudinal tenotomy of the subscapularis (Figure 3). The initial point of the tenotomy coincided with the lower border of the glenoid cavity. We then transferred the biceps tendon to the intra-articular medium through the access created in the subscapularis tendon, thus generating a band inferior to the tendon and a band superior to it. We then attached the long biceps tendon to the antero-inferior border of the

glenoid cavity, next to the labrum, thus creating the tendon block (Figure 4). We positioned two 4.9mm metal anchors on the anterior border of the glenoid cavity (Figure 5). We passed the suture threads through the labrum and tendon (Figure 6).



Figure 3. Longitudinal tenotomy of the subscapularis tendon neighboring the lower border of the glenoid cavity, and passage of the guidewire of the bicipital tendon.

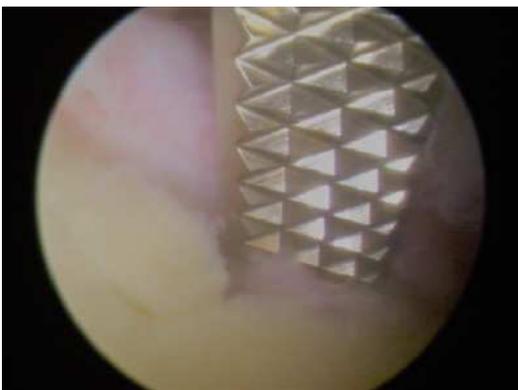


Figure 4. Glenoidal labrum displacement for anterior repositioning and reinsertion near the tendon.

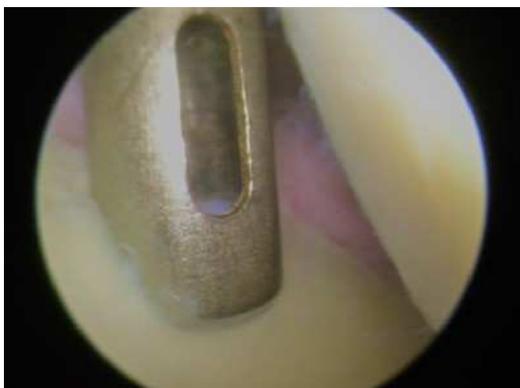


Figure 5. Positioning of the bioabsorbable anchors at the antero-inferior border of the glenoid cavity.

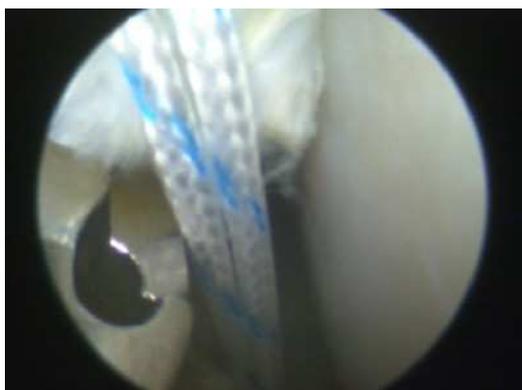


Figure 6. Reinsertion of the labrum and biceps; passage of the wire through the labrum and bicipital tendon.

DISCUSSION

The biceps brachii muscle is a flexor and supinator of the forearm^{13,14}. Proximally, the short head of the biceps attaches to the scapula's coracoid process¹³. The tendon of the long head passes within the capsular ligament in the head of the humerus in the bicipital groove and inserts in the scapula's supraglenoid tubercle¹³⁻¹⁵. The long tendon of the biceps is a stabilizer of the joint, acting as a humeral depressor during abduction in the plane of the scapula^{13,14}.

Several conditions, traumatic or degenerative, can affect the tendon and cause pain^{12,15,16}. Tenotomy is an appropriate treatment, not bringing clinical consequences such as instability, chondral injury or rise of the humeral head¹³⁻¹⁷. The long biceps tendon was considered a trace structure, since it operates as a secondary stabilizer in bipedal primates, and whose absence does not affect the shoulder function¹⁶. The short biceps tendon has the coracoid process at its proximal anchoring point^{11,14,15}. Damage to the short tendon brings clinical repercussions, generating loss of strength in elbow flexion¹¹.

In the coronary process transfer surgery (Latarjet), the joint tendon is transferred next to the graft¹¹. The tendon is responsible for the tension of the subscapularis and the formation of the anterior myotendinous block^{10,11}. In an eventual avulsion or non-consolidation of the graft, the impairment of the flexural strength can be expected¹¹.

In view of this information, we suggest the transfer of the long biceps brachii tendon to the anterior border of the glenoid cavity through the subscapular tendon, thus reproducing the tensile effect, creating an anterior barrier and increasing the labral surface through augmentation with the tendon^{11,13-19}.

We believe that this may be a viable option for patients with anterior glenohumeral instability, with Bankart's injury, with mild to moderate bone loss, and with an intact rotator cuff.

RESUMO

O objetivo deste trabalho é descrever, em cadáver, a técnica de transferência do tendão longo do bíceps para o tratamento da instabilidade anterior do ombro. Nesta técnica, o tendão longo do bíceps braquial é desinserido do tubérculo supraglenoidal e transferido para a borda anterior da cavidade glenoidal, através da tenotomia do subescapular, reproduzindo o efeito tirante e aumentando o batente anterior. A técnica é de fácil execução, minimizando os riscos da transferência do processo coracoide e pode ser uma opção para o tratamento da instabilidade glenoumeral.

Descritores: Instabilidade Articular. Luxação do Ombro. Articulação do Ombro.

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Mailing address:

Yonder Archanjo Ching San-Júnior

E-mail: yondersanjr@gmail.com / dr.yonder@gmail.com