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Update Article

Disorders of the long head of the biceps: tenotomy *versus* tenodesis☆

*Fabiano Rebouças Ribeiro**, *André Petry Sandoval Ursolino*, *Vinicius Ferreira Lima Ramos*, *Fernando Hovaguim Takesian*, *Antonio Carlos Tenor Júnior*, *Miguel Pereira da Costa*

Hospital do Servidor Público Estadual de São Paulo, Departamento de Ortopedia, São Paulo, SP, Brazil

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ABSTRACT

Disorders of the long head of biceps tendon are common in clinical practice. Their causes could be degenerative, inflammatory, instability (subluxation or luxation) or traumatic. They are generally associated to other diseases of the shoulder, mainly rotator cuff injuries. Currently, there is controversy in the literature regarding the indications for surgical treatment and the choice of the best technique for each case, due to the possibility of esthetic deformity, loss of muscle strength, and residual pain.

The objective of this study was to identify the indications for surgical treatment, the best surgical technique, and the advantages and disadvantages of each technique described in the orthopedic literature for the treatment of long head of biceps tendon injuries.

A revision of the orthopedic medical literature on the following databases: Biblioteca Regional de Medicina (BIREME), Medline, PubMed, Cochrane Library and Google Scholar, comprising articles published in the period from 1991 to 2015.

Lesões do cabo longo do bíceps: tenotomia *versus* tenodese

Palavras-chave:
Síndrome de colisão do ombro
Tenotomia
Tenodese
Bainha rotadora
Dor de ombro

RESUMO

As lesões da cabeça longa do tendão bicipital (CLB) são comuns na prática clínica e podem ter causas degenerativas, inflamatórias, instabilidades (subluxação ou luxação) ou traumáticas. Geralmente, elas estão associadas a outras doenças do ombro, principalmente a lesões do manguito rotador. Atualmente, existem controvérsias quanto às indicações dos tratamentos cirúrgicos e à escolha da melhor técnica para cada caso, devido à possibilidade de deformidade estética, perda da força muscular e dor residual.

☆ Study conducted at the Hospital do Servidor Público Estadual de São Paulo, Grupo de Ombro e Cotovelo, São Paulo, SP, Brazil.

* *Corresponding author.*
E-mail: fabianoreboucas@globo.com (F.R. Ribeiro).

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O objetivo deste estudo foi identificar as indicações do tratamento cirúrgico, a melhor técnica cirúrgica e as vantagens e desvantagens de cada técnica descritas na literatura médica ortopédica no tratamento das lesões da CLB.

Foi realizada revisão da literatura médica ortopédica disponível na base de dados da Biblioteca Regional de Medicina (BIREME), Medline, PubMed, Cochrane Library e Google Scholar, incluindo artigos publicados no período de 1991 a 2015.

Introduction

The long head of the bicipital tendon (LHB) is intra-articular and extrasynovial; it has a flat surface at its origin and becomes rounded in the bicipital groove. It originates in the superior labrum and the supraglenoid tubercle.[1] Vangsness et al.,[2] in a cadaveric study, classified the origin of the LHB into four types; type 3, with input from the anterior and posterior labrum, was the most common. Luciano et al.,[3] in a histological study, concluded that macroscopic inspection is not sufficient to assess the origin of the tendon and that, when analyzed microscopically, the contribution of the anterior labrum is greater than that suggested by macroscopic inspection.

The intra-articular portion of the LHB has an oblique inclination of approximately 30–40°; it passes through the anterior rotator interval shoulder and leaves the joint through the intertubercular groove, which has a mean of 4 mm depth and 56° of medial tilt.

The LHB's intra-articular stabilizers are the biceps reflection pulley (the most important stabilizer, composed of the upper glenohumeral and coracohumeral ligaments) and the fibers of the subscapular and supraspinal muscles tendons. The stabilizers of the extra-articular portion are the intertubercular groove and the transverse ligament (less important stabilizer, composed of fibers of the subscapularis muscle tendon).[4]

The LHB is innervated by the musculocutaneous nerve (C5–C7 roots), and it is vascularized by the ascending branch of the anterior circumflex artery, labial branches of the suprascapular artery, and branches of the thoracoacromial artery. It has two anatomical zones related to its vascularization: the traction zone, with normal vascularization, and the sliding zone, in which there is a reduction in vascular supply, situated from 1.2 to 3 cm from its origin and that may be associated with degenerative lesions.[5]

The function of the LHB in the shoulder is controversial in the literature; some authors consider it to be a vestigial structure with no function (embryonic remnant),[6–8] while others attribute important functions to it, such as humeral head depressant and anterior stabilization.[9–13] In the injured shoulder (unstable or with rotator cuff injury), it is consensually understood to have a stabilizing function, but causes pain. Levy et al.,[8] in an electromyographic study, demonstrated that when elbow function was isolated, the LHB had no function during movement of the shoulder arc; these authors then concluded that the function of the LHB in the shoulder would be interconnected with the movements of the elbow.

LHB lesions are common in clinical practice and may be due to degenerative, inflammatory, instability-related (subluxation or dislocation), and traumatic causes. The inflammatory causes are divided as follows: primary causes, which are rarer, representing only 5% of the cases and usually affecting young patients and throwing athletes; secondary causes, which are more common and usually associated with other shoulder disorders, such as rotator cuff tears, impingement syndrome, and superior labrum anterior to posterior (SLAP) lesion, in which the tendon undergoes microscopic and/or macroscopic alterations.[14]

In most cases, the physical examination is non-specific and makes the initial diagnosis difficult. Upon inspection, the *Popeye* sign, limitation of passive elevation (hourglass biceps, described by Boileau et al.[15]) and pain on palpation in intertubercular sulcus may be observed. Stimulative tests for impingement syndrome are generally positive for LHB disorders. Tests that are more specific for SLAP lesion can also be positive, such as the O'Brien test,[16] biceps load test,[17] crank test,[18] and speed test.[18] The Yergasson test[19] is positive in the case of LHB instability in intertubercular groove.

As an auxiliary method to clinically diagnose LHB injuries, the anesthetic test can be made, injecting 8–10 mL of local anesthetic into the subacromial space, which causes pain relief in cases of impingement syndrome and rotator cuff injuries, but not in LHB disorders. It is also possible to inject the intertubercular groove (preferably with the aid of ultrasonography), in which case pain would improve.[14]

Complementary tests commonly used to assess LHB disorders are radiograph of the shoulder by tangential incidence (Fisk[20] method), which evaluates the presence of structural changes in intertubercular groove; ultrasound, which presents high specificity and sensitivity in case of complete lesions or dislocations, albeit not reliable to detect minor lesions or subluxations; and magnetic resonance imaging (MRI), which has low interobserver reproducibility for isolated bicipital disorders, with a sensitivity of 52%, but diagnosis may be sensitized with the use of contrast (arthro-MRI), with an increase in sensitivity to 90%. The diagnostic method considered gold standard for bicipital disorders is arthroscopy, which allows a macroscopic evaluation of the tendon, its stability, and the presence of associated lesions, as well as the assessment of the extra-articular portion of the LHB by its traction into the joint.[21–23]

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