



Original Article

Direct repair of chronic distal biceps tendon tears[☆]

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ABSTRACT

Objective: To present the results from direct tendon repair using EndoButton and interference screws in patients with lesions of the distal biceps that had evolved over a period of more than 28 days.

Methods: Between January 2012 and November 2013, eleven patients (all male) with a torn distal biceps and a time interval between injury and surgery of more than 28 days were evaluated. The patients' mean age was 46 years and the most common mechanism of injury was eccentric loading with the elbow flexed and supinated.

Results: A subjective analysis on pain and function was conducted using a visual analog scale of pain (VAS) and the Mayo Elbow Performance Score (MEPS), before and after surgery. The VAS showed a decrease of 5 points to 0.8 points on average. The MEPS improved from 69.3 points before the operation to 97.5 points afterwards. The mean flexion was 133.1° on the operated side, versus 134.3°. The mean extension was -2.5° and 0° (operated side versus non-operated). Supination was 88.2° versus 89.5° and pronation was 82.5° versus 84.1°, comparing the operated side versus the non-operated side. Flexion and supination strengths were evaluated with the aid of a dynamometer, and the mean flexion and supination strengths were found to be respectively 78.57% and 89.65% of the strength of the non-operated limb.

Conclusion: Use of the technique of direct tendon repair using EndoButton and interference screws was shown to be a safe and effective alternative for repairing chronic lesions of the distal biceps.

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Reparo direto das lesões distais crônicas do tendão bicapital

RESUMO

Objetivo: Apresentar os resultados do reparo direto do tendão com EndoButton e parafuso de interferência nos pacientes com lesão do bíceps distal com evolução maior do que 28 dias.

Palavras-chave:

Traumatismos dos tendões

Tenodese

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Transferência tendinosa
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Métodos: Entre janeiro de 2012 e novembro de 2013, 11 pacientes (todos do sexo masculino) com ruptura do bíceps distal com intervalo da lesão e cirurgia maior do que 28 dias. A idade média foi de 46 anos e o mecanismo de trauma mais comum foi uma carga excêntrica com o cotovelo em flexão e supinação.

Resultados: Foi feita uma análise subjetiva da dor e função com a Escala Visual Analógica de Dor (EVA) e o Mayo Elbow Performance Score (MEPS) pré e pós-operatório. Houve uma diminuição da EVA de 5 pontos para 0,8 ponto em média. O MEPS melhorou de 69,3 pontos no pré para 97,5 pontos no pós-operatório. A média de flexão foi de 133,1° do lado operado contra 134,3°. A média de extensão foi de -2,5° e 0° (lado operado × não operado). Supinação foi de 88,2° × 89,5° e pronação 82,5° × 84,1° quando comparado o lado operado versus o lado não operado. A força de flexão e supinação foi avaliada com o auxílio de um dinamômetro e verificamos que a força média de flexão e supinação correspondia, respectivamente, a 78,57% e 89,65% a força do membro não operado.

Conclusão: A técnica do reparo direto do tendão com o uso de EndoButton e parafuso de interferência mostra-se como uma opção segura e eficaz para o reparo direto das lesões crônicas do bíceps distal.

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Introduction

Distal bicipital tendon injuries are relatively rare, representing only 3% of biceps injuries; the most frequent is the involvement of the long head of the biceps tendon in its proximal portion (96%).¹ Often, the injury mechanism is an eccentric load with the elbow in flexion and supination in male patients between the fifth and sixth decade of life. Its pathophysiology is little understood, but it is known that degenerative tendinopathy, mechanical impact, some endocrinous diseases, and the use of anabolic steroids are involved in the onset of this entity.²

Although the clinical findings are classic, the rarity of the injury and the good movement arc presented by the patients lead to a late presentation and diagnosis. Historically, conservative treatment was suggested for the management of acute injuries. However, after biomechanical studies demonstrated loss of flexion and supination forces of up to 30% and 40%, respectively, many authors recommended that the acute anatomical repair should be preferred to the non-anatomical repair with the brachial tendon.³ With results of loss of supination force of around 50% after transfer technique with the brachialis tendon, new techniques emerged, making the direct repair the treatment of choice, primarily in patients who aim for a full return to their activities.⁴

Chronic injuries are often difficult to treat due to tendon retraction, muscular atrophy, and associated fibrosis. However, the conservative treatment presents unsatisfactory results. Although there is no consensus on the definition of the chronic injury time interval, the use of tendon graft is recommended in chronic ruptures to restore the length and prevent flexion contracture of the elbow.⁵ The autologous graft can cause donor-site morbidity, and the use of an allograft still presents risks of infection and high costs in some places. The literature features countless repair techniques for acute injuries and graft reconstruction techniques for chronic injuries. However, there are few studies assessing

the results of graftless direct repair treatment for chronic injuries.^{1,2,6,7}

This study aimed to present the results of the modification of the technique by Bain et al.,⁸ which consists of direct tendon repair with EndoButton and interference screw in patients with distal biceps injury with evolution longer than 28 days.

Material and methods

From January of 2012 to November of 2013, eight patients (all males) with distal biceps rupture and interval between injury and presentation longer than 28 days were operated by a single elbow specialist, after approval by the ethics committee of the institution. The diagnosis was performed based on the clinical history, physical examination, and additional exams (Figs. 1-3).

The mean age of the patients was 47.5 years, and the most common trauma mechanism was an eccentric load with the elbow in flexion and supination. Two patients were injured during weightlifting (tractor tire and loaded weightlifting bar) and one during a fall to the ground. The mean interval from the day of the trauma to surgery was 71.8 days.

The Mayo Elbow Performance Score (MEPS) and a visual analog scale for pain (VAS) were applied in the pre- and post-operative periods. The assessment of the flexion and supination forces was performed only in the post-operative period; the contralateral side was used for comparison.

To assess flexion and supination forces, a digital dynamometer (Lafayette Manual Muscle Testing System model 01165, Lafayette, IN 47903) was used, with help of a properly marked wooden stick to facilitate the measurement of the supination and avoid interference with the momentum of the applied forces (Figs. 4-7). Four measurements were taken, always by the same evaluator, and the mean of the last three was calculated. The first measurement was disregarded to avoid bias caused by the patient's awareness of the

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