SOCIEDADE BRASILEIRA DE ORTOPEDIA E TRAUMATOLOGIA

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Case report

Simultaneous bilateral distal biceps tendon repair: case report☆

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ARTICLE INFO

Article history:
Received 11 January 2016
Accepted 5 February 2016
Available online 23 December 2016

Keywords:
Rupture/diagnosis
Rupture/etiology
Rupture/surgery
Tendon injuries

ABSTRACT

Simultaneous bilateral rupture of the distal biceps tendon is a rare clinical entity, seldom reported in the literature and with unclear therapeutic setting. The authors report the case of a 39-year-old white man who suffered a simultaneous bilateral rupture while working out. When weightlifting with elbows at 90° of flexion, he suddenly felt pain on the anterior aspect of the arms, coming for evaluation after two days. He presented bulging contour of the biceps muscle belly and ecchymosis in the antecubital fossa, extending distally to the medial aspect of the forearm, as well as a marked decrease of supination strength and pain in active elbow flexion. MRI confirmed the rupture with retraction of the distal biceps bilaterally. The authors opted for performing the tendon repairs simultaneously through the double incision technique and fixation to the bicipital tuberosity with anchors. The patient progressed quite well, with full return to labor and sports activities, being satisfied with the result after two years of surgery. In the literature search, few reports of simultaneous bilateral rupture of the distal biceps were retrieved, with only one treated in the acute phase of injury. Therefore, the authors consider this procedure to be a good option to solve this complex condition.

Reparo de ruptura bilateral simultânea do bíceps distal: relato de caso

Palavras-chave:
Rotura/diagnóstico
Rotura/etiologia
Rotura/cirurgia
Traumatismos dos tendões

RESUMO

A ruptura bilateral simultânea dos tendões distais do bíceps é uma entidade rara, pouco relatada na literatura e com definição terapêutica pouco clara. Relatamos o caso de um homem branco de 39 anos que sofreu ruptura bilateral simultânea durante treino de academia em que ao pegar peso com os cotovelos em flexão de 90° sentiu dor súbita na face anterior dos braços e compareceu para avaliação após dois dias. Apresentava abaulamento do contorno do ventre muscular do bíceps braquial e equimose na região da fossa antecubital que se estendia distalmente para a face medial do antebraço, além de grande

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http://dx.doi.org/10.1016/j.rboe.2016.12.006

diminuição da força de supinação e dor à flexão ativa do cotovelo. Ressonância nuclear magnética (RNM) confirmou a ruptura com retração do bíceps distal, bilateralmente. Optou-se pelo reparo das lesões simultaneamente com a técnica de dupla incisão e fixação do tendão à tuberosidade bicipital com âncoras. O paciente evoluiu de forma bastante satisfatória, com retorno completo às atividades laborais e esportivas, está bastante satisfeito com o resultado após dois anos da cirurgia. Na pesquisa da literatura, foram achados muito poucos casos descritos de ruptura bilateral simultânea do bíceps distal. Desses, somente um foi tratado na fase aguda da lesão. Portanto, os autores consideram o procedimento descrito como uma boa opção para a resolução dessa complexa condição.

Introduction

Simultaneous bilateral rupture of the distal biceps tendon is an extremely rare entity with few reports in the literature, which can lead to devastating functional effects for the patient.

The literature describes several surgical options for unilateral rupture of the distal biceps tendon, with different approaches, types of suture, and fixation methods. For bilateral ruptures, in turn, there is no consensus on the surgical technique, the most appropriate moment to perform the surgery, or rehabilitation protocols.

In a literature review, it was observed that there are very few reported cases of simultaneous bilateral rupture of the distal biceps. Among them, the surgical treatment took place during the acute phase in only one case, but fixation was performed with a six-week interval between procedures.[1]

The authors report the case of a patient with bilateral simultaneous distal biceps tendon rupture during elbow-flexion resistance exercise, who underwent surgical repair of both sides in one time.

Case report

A 39-years-old white male and right-handed patient presented to our service with history of sudden-onset pain and deformity on the anterior aspect of both arms after attempting to lift weights in the gym with elbows flexed at about 90° two days before.

He had no significant history of previous disease or elbow pain. He practiced weightlifting only as a physical activity seeking health maintenance; he denied seeking substantial muscle hypertrophy. He had been on endocrinological treatment for hormone replacement for six months.

Upon physical examination, an obvious deformity was observed on the anterior aspect of the arm, with bulging contour of the biceps muscle belly and bruisings on the antecubital fossa area extending distally to the medial aspect of the forearm. The patient had pain on palpation and absence of the biceps tendon on the anterior aspect of both elbows. He also presented great strength loss for and pain on flexing the elbows. Neurological and vascular functions were preserved bilaterally.

The images obtained by magnetic resonance imaging disclosed complete rupture of the distal biceps tendons, with 5 cm retraction on the right and 4.6 cm on the left side.

After discussing the case with the patient and family, the authors opted for immediate surgical treatment and repaired the ruptures in both limbs during the same procedure.

The technique used for both limbs was the double incision and tendon anchor fixation.

Surgical technique

The patient was placed on the operating table in supine position, without tourniquets. The surgery was initiated on the right upper limb. A transverse incision of approximately 3 cm was made above the cubital skin fold (Fig. 1). The biceps tendon is easily captured when the skin is retracted proximally and away from the deep tissues. The most distal portion of the degenerated tendon was resected; the tendon was repaired using Bunnell sutures with nonabsorbable No. 5 threads. Then, the radial tuberosity was palpated and a curved Kelly forceps was passed through the biceps tendon tunnel, between the ulna and the radius, and it was advanced until its tip could be palpated on the dorsal aspect of the proximal forearm (Fig. 2). A second incision was made over the forceps; the tuberosity

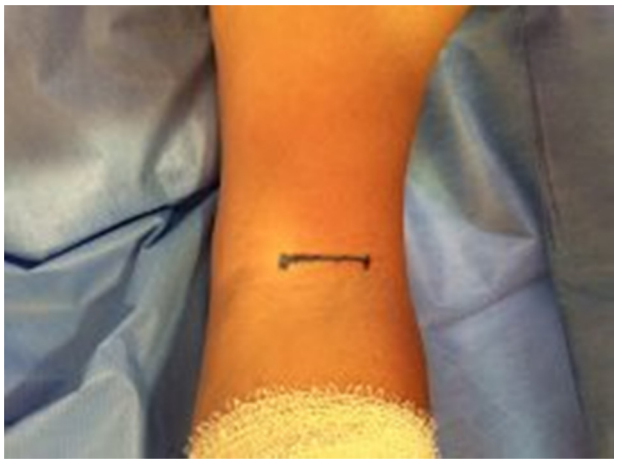

Fig. 1 – Incision mark on the anterior cubital crease.

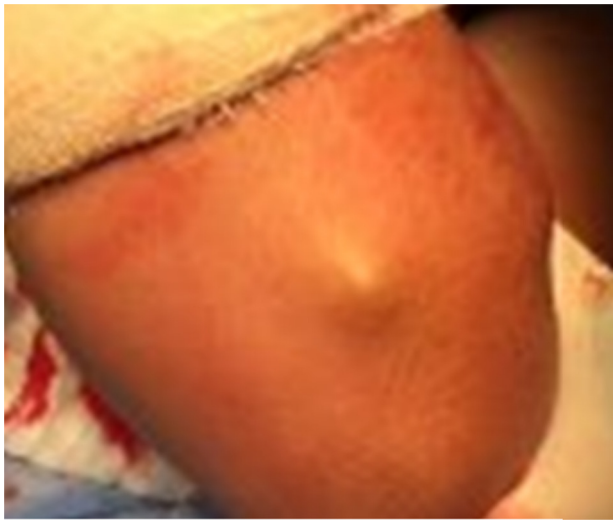

Fig. 2 – Intraoperative image showing the prominence of the Kelly forceps passed through the bicipital tunnel.

was exposed through muscle divulsion with the forearm in maximal pronation (Fig. 3).

The radial tuberosity was scarified until it presented bleeding. Two bioabsorbable, double-loaded 2.9-mm anchors were positioned, and the biceps tendon was transported through its tunnel with the repair wire. The anchor wires were passed through the tendon for a U-suture. The nots were held with the forearm pronated and the elbow at 90° flexion. After testing the stability of the fixation, the skin was sutured and both limbs were immobilized with slings.

The sling was maintained for one week; thereafter, physical therapy was initiated. Initially, exercises of passive flexion and active extension with the forearm in supination were performed, as well as passive supination and active pronation to 50°. The limbs were immobilized with the slings when not in physiotherapy. This phase lasted until the end of the third week, when exercises to increase flexion and active supination without load were initiated; at this phase, the patient

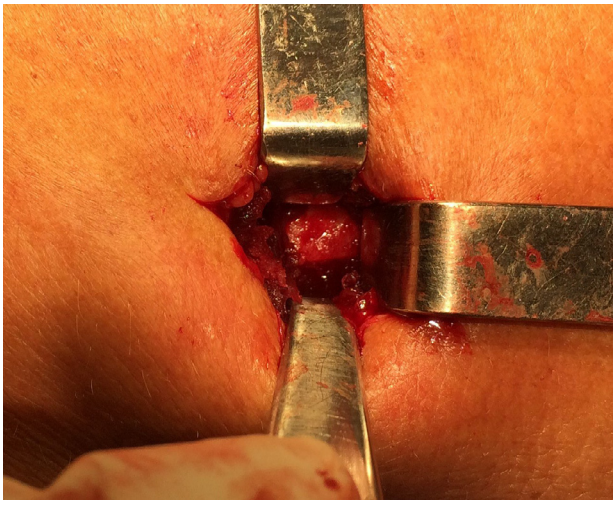

Fig. 3 – Intraoperative image showing the exposed radial tuberosity.

was instructed to interrupt the use of the slings. Muscle strengthening exercises were initiated after the sixth week, progressively increasing the load. Three months after surgery, the patient had full range of motion without pain, but still presented decreased muscle strength. After the fourth month, he was allowed to return to the gym for progression of muscle strengthening. At five months post-operative, the patient had recovered full muscle strength and returned to daily activities.

The last assessment took place two years after the procedure. The patient reported having recovered 100% of pre-injury function and having made a complete return to labor and sports activities.

Discussion

Simultaneous rupture of the distal biceps tendon is a rare diagnosis, and the most suitable treatment of such an injury depends on numerous factors. Bayat et al.[2] reported the case of a 50-year-old mountain climber who had suffered a simultaneous bilateral rupture during practice. He underwent reconstruction with fascia lata graft two years after injury, with a six-month interval between the two limbs. Bell et al.[3] reported 26 cases of rupture of the distal biceps, one of which was a simultaneous bilateral rupture. Those authors did not report the type and time of surgery for this case.

Rokito and Iofin[4] reported the case of a recreational bodybuilder, aged 51 years, who suffered a simultaneous bilateral rupture when performing a Scott curl with a 40 kg load. He underwent primary repair in one side seven weeks after injury, followed by allograft reconstruction at 13 weeks post-injury in the contralateral limb.

DaCambra et al.[1] described the only case found in the literature review in which the injury was repaired bilaterally while still in the acute phase, but in a staged manner. They presented the case of a 43-year-old patient initially submitted to acute repair in the right limb, and six weeks after in the left limb, both with a single anterior approach technique with Endobutton fixation.

The current literature defines as acute injuries those with less than six weeks and as chronic, those over six weeks. This six-week cut-off is arbitrary, but it creates a guideline. After this period, repair becomes increasingly difficult.

The present case featured acute ruptures, a few days from injury. To avoid the risk of tendon transfer reconstruction, the authors decided to address both limbs in the same surgical time. None of the few cases described in the literature were treated in this way. The decision regarding whether to carry out the repair of both injuries in the same time or in a staged manner should be made after assessing certain patient variables, such as socioeconomic status, the level of understanding, dominant limb, occupation, and general health status.[1]

Several studies[5,6] have shown satisfactory results with the Boyd and Anderson double incision technique.[7] However, it requires a tendon of sufficient length to allow its attachment to the radial tuberosity. Delayed treatment, proximal retraction, possible degenerative changes, and scarring around the

site can cause difficulties for using this technique.[1] In the present case, the authors opted for this approach due to the familiarity of the surgeons with the technique and the fact that the injury had happened just a few days before surgery.

Conclusions

The present patient presented an excellent functional result in the two-year follow-up, with complete return to labor and sports activities; he reported to have fully recovered the pre-injury function. The authors believe that this is the first case described in the literature of a simultaneous bilateral acute rupture of the distal biceps successfully repaired in a single surgical time using the double incision technique and fixation anchors, which represents a valid option for this challenging condition.

Conflicts of interest

The authors declare no conflicts of interest.

REFERENCES

1. Dacambra MP, Walker RE, Hildebrand KA. Simultaneous bilateral distal biceps tendon ruptures repaired using an endobutton technique: a case report. J Med Case Rep. 2013;23(7):213.
2. Bayat A, Neumann L, Wallace WA. Late repair of simultaneous bilateral distal biceps brachii tendon avulsion with fascia lata graft. Br J Sports Med. 1999;33(4):281–3.
3. Bell RH, Wiley WB, Noble JS, Kuczynski DJ. Repair of distal biceps brachii tendon ruptures. J Shoulder Elbow Surg. 2000;9(3):223–6.
4. Rokito AS, Lofin I. Simultaneous bilateral distal biceps tendon rupture during a preacher curl exercise: a case report. Bull NYU Hosp Jt Dis. 2008;66(1):68–71.
5. Baker BE, Bierwagen D. Rupture of the distal tendon of the biceps brachii. Operative versus non-operative treatment. J Bone Joint Surg Am. 1985;67(3):414–7.
6. Agins HJ, Chess JL, Hoekstra DV, Teitge RA. Rupture of the distal insertion of the biceps brachii tendon. Clin Orthop Relat Res. 1988;(234):34–8.
7. Boyd MM, Anderson LD. A method for reinsertion of the distal biceps brachii tendon. J Bone Joint Surg Am. 1961;43:1041–3.