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CASE REPORT

Arthroscopic Treatment in the Distal Rupture of the Triceps Brachial Tendon in Elite Athlete: A Case Report

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ABSTRACT

Injuries (rupture, avulsion) of the triceps tendon are considered infrequent injuries, which mainly affect the male gender and are directly associated with injuries that occur during sports and in a high percentage due to the consumption of steroids. The diagnosis and treatment must be carried out early, especially in those patients with high functional demand or elite athletes, in order to obtain good functional results. The clinical examination should be accompanied by diagnostic imaging studies. There is conservative treatment for lesions affecting less than 50% of the tendon, but those lesions that compromise over 50% of the tendon, surgical treatment is the indication. It could be performed through an open approach or via arthroscopic (barely described in the literature). The time of injury is the key point the early surgical treatment has shown to have optimal outcomes. However, there is no consensus on the surgical approach and its functional outcome.

Keywords: elbow arthroscopy, triceps brachii injuries, arthroscopic surgery, distal triceps repair, arm injuries, athletic injuries.

INTRODUCTION

Between the ages of 30 and 55, the triceps brachii tendon lesion accounts for between 1-2% of all upper limb tendon lesions. It most commonly occurs in the distal insertion of the tendon with the olecranon in avulsions (1-4) (insertional bone component) and is linked to direct traumas of moderate and high energy. The arm is extended by contraction of the triceps. As far as we know, there is still debate regarding whether to treat these lesions arthroscopically or with an open technique.

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The aim of this manuscript is to describe the functional outcome of triceps brachii injury in an elite athlete treated by astroscopic technique. ❑

CASE PRESENTATION

A 52-year-old male, elite weightlifter, with no history of steroid use, felt a snap/break while performing weightlifting activity (concentric contraction) when he tried to reach weight placement, with intense pain in the back of his right elbow. On physical examination, a large area of ecchymosis (Figure 1, left) is seen on the posterior aspect of the right elbow, with an increase in volume, functional restriction of elbow extension, and a gap of about 1-2 cm at the proximal edge of the olecranon. The modified Thompson's test was positive. An anteroposterior and lateral elbow radiograph (Figure 1, center) was performed; there was sign of acute bone injury. Avulsion and distal insertion rupture of the triceps tendon can be seen on magnetic resonance imaging (3). Dynamic ultrasound (Figure 1, right) was performed, where complete tendon rupture of the insertion was observed and could be related to magnetic resonance images that confirmed tricipital avulsion without retraction.

Surgical technique

With the patient under the effects of general anesthesia, in dorsal supine position, antisepsis procedures were performed and an aseptic technique was used, followed by the placement of sterile surgical fields over the elbow in flexion at 90 degrees on Mayo's table (Figure 3, left); a tourniquet was not used, to avoid triceps contraction and allow for an easier traction of the tendon to its anatomical insertion site; demarcation of bone reliefs with a demographic marker was performed. Two arthroscopic portals (lateral and medial) and one posterior accessory portal for direct vision of the right elbow were made. Avulsion is observed at the distal insertion of the triceps tendon, with a lack of continuity of muscle fibers and multiple adhesions. Great White shaver blade synovectomy + adhesion release, following the longitudinal axis of the avulsioned triceps tendon, was performed with a radiofrequency tip (4, 5). Application of one transverse

FIGURE 1. Clinical imaging and diagnostic studies – *left*: ecchymotic area three days after injury; *center*: radiographic image, where avulsion image is observed; *right*: diagnostic ultrasound, where the loss of distal triceps continuity towards the olecranon is visualized.

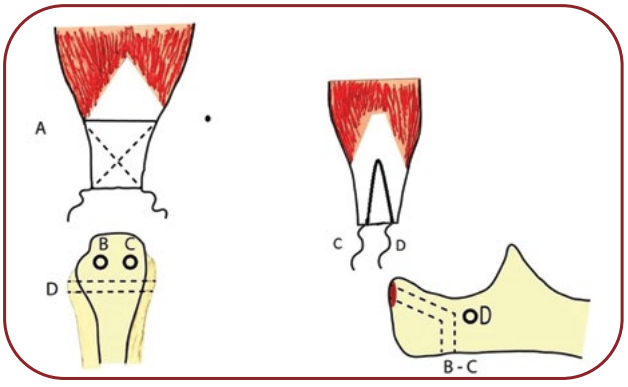

FIGURE 2. Surgical scheme

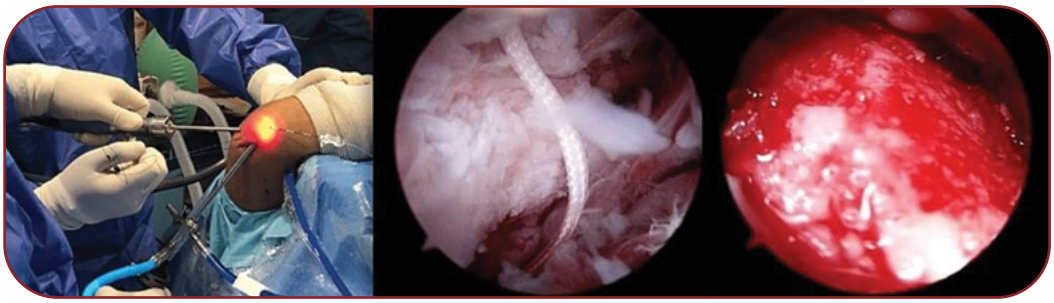

FIGURE 3. Intraoperative images – *left*: arthroscopic portals, medial, lateral and direct posterior; *center*: the supersuture once it passes through the bone tunnel (transosseous technique); *right*: blood zone of the original insertion (posterior face of the olecranon), where the distal extremity of the tricep tendon was fixed.

supersuture was performed through the triceps tendon at 6 cm from the avulsioned distal end, guided with a quick pass (Figure 3, center); the supersuture braiding was performed with a beakbird clamp towards the distal end, in the form of a pin knot/cerclage. One supersuture was passed at the most distal avulsioned end, including bone fragment. Transversely, medial-lateral sutures were identified and separated. We proceeded to perform crimping of the anatomical insertion site (Figure 3, right) utilizing a transosseous system through the medial and lateral tunnel in a posterior-anterior direction, with a 1.0 passage of suture, performing anatomical reduction of the avulsioned tendon; fixing it with knot faced with a crimping site in the holes of the lateral and individual medial transbony tunnels (Figure 2). Reinforcement supersuture passages were performed for tractional force discharge from the reinserted distal end, which was knotted 6-8 cm proximally to the olecranon in the transbony tunnel in a transverse fashion to the longitudinal axis of the humerus, with suture in the form of cerclage. Arthroscopic portal closure with nylon 3.0, flat gauze, was performed, and adhesive fabric dressings were placed over the incision sites. A fixed immobilizer with the right elbow flexed at 60 degrees (articulated splint) was placed (6, 7), which the patient used 24/7 for three weeks and then two more weeks to avoid physical contact when walking.

Two scales were utilized: 1) the preoperative assessment rating scale (Mayo Elbow Performance Score), with a result of 30/100 points, which is based on the following parameters for measurement of results: good=complete mobility and no pain in the elbow; regular=loss of movement less than 20° in any direction or mild pain; and bad=loss of movement of 20° or more in any direction or pain at rest; and 2) Quick-Dash, a questionnaire which contains questions about patients' symptoms and their ability to perform certain activities, with the different daily activities that the patient can perform before and after surgery being considered as parameters. ❑

RESULTS

After six weeks, the following results were obtained: the Mayo Elbow Performance Score raised from 30/100 before surgery to 95/100 after surgery, and Quick-Dash, from 77 points before surgery to 18 points after surgery, with full elbow flexion-extension (Figure 4).

The patient displayed active mobility beginning with the third postoperative week and returned to his work five weeks after surgery. In the sixth week he began the muscle strengthening phase with elastic bands, improving the functional result against gravity with a complete pronosupination. It was possible to reduce the re-

FIGURE 2. Postoperative clinical imaging – *left*: flexion; *right*: full extension

covery and immobilization times compared to the recovery times after the open technique. The patient was discharged after 11 weeks from surgery and resumed his daily sports activities, without reporting any complications after seven months. ❑

DISCUSSION

Triceps tendon ruptures are rare injuries (8). There is currently no consensus on treatment since the described cases are case reports. A decision point of treatment is for the patient to undergo conservative or surgical management, with the latter presenting the option of open or arthroscopic management, the choice of which will be based on the experience of the shoulder surgeon (upper-limb). We present the arthroscopic surgical technique by means of transosseous tunnels, which according to bibliographic reviews is better indicated, due to reduced healing and immobilization times, without reports of re-rupture. This technique allows us to expand the load surface to disperse the tension in sutures by arthroscopy-guided vision achieving anatomical reinsertion (insertional footprint). We also report that the functional results are good to excellent as measured by the Quick-Dash and Mayo Elbow Performance Score. Our perspective is to measure the long-term functional outcome; likewise, we believe that ultrasound is an effective method for diagnosis; choice of treatment and postoperative follow-up of this type of lesions for being a non-invasive, fast, effective and dynamic method in a normal functional state, that is, with the patient in standing or sitting position, where the biomechanics would not be altered. ❑

CONCLUSIONS

We conclude that the arthroscopic surgical technique is an alternative with excellent functional results as well as to shorten the time needed for recovery. ❑

Human subjects' informed consent: Consent was obtained or waived by all participants in this study.

Conflicts of interest: none declared.

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