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Brachial Biceps Tendon Rupture: About A Case and Review of the Literature

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Abstract **Case Report**

Distal ruptures of the biceps brachial tendon are rare, estimated at 1.2 ruptures per 100,000 patients per year, in a male population between 40 and 50 years old. The mechanism is most of the time post-traumatic by excentric contraction of the biceps and results in its disinsertion from radial tuberosity. Sometimes trauma can be minor due to tendon histological changes observed after 35 years, which weaken the tendon insertions and the presence of a hypo vascularized zone in the terminal part of the biceps brachial tendon. The absence of surgical reinsertion of the distal tendon of the brachial biceps muscle leads to little clinical outcome satisfactory with loss of strength in flexion and supination of the forearm and sometimes disabling residual pain.

Keywords: Brachial-Biceps-Tendon-Rupture-Pain.

INTRODUCTION

Ruptures of the distal biceps brachial tendon are rare, partly explaining the late, even misunderstood diagnoses of this lesion. They represent only 3% of cases of this muscle lesion. The origin is usually traumatic.

Surgical treatment has evolved a lot and several techniques surgeries are described. Surgical reinsertion of the tendon on the tuberosity radial is a technique giving entire satisfaction to the most of the time, but is not without complications. Nevertheless, the quality of healing of the bicipital tendon on the cortical bone of the radial tuberosity has never been studied, regardless of the surgical technique used for reinsertion (trans osseous, anchor, endo button and endoscopy).

The aim of this study is to analyze the clinical outcome reinsertions by anchors distal ruptures of the tendon of the biceps brachial muscle. A radiographic study by MRI was conducted in parallel to study the quality of healing of the tendon on the radial tuberosity.

We report a case of rupture of the distal tendon of the biceps brachial surgically treated with the technique of the endobutton in our Department of Orthopedics and Traumatology in the Ibn Sina Hospital of Rabat.

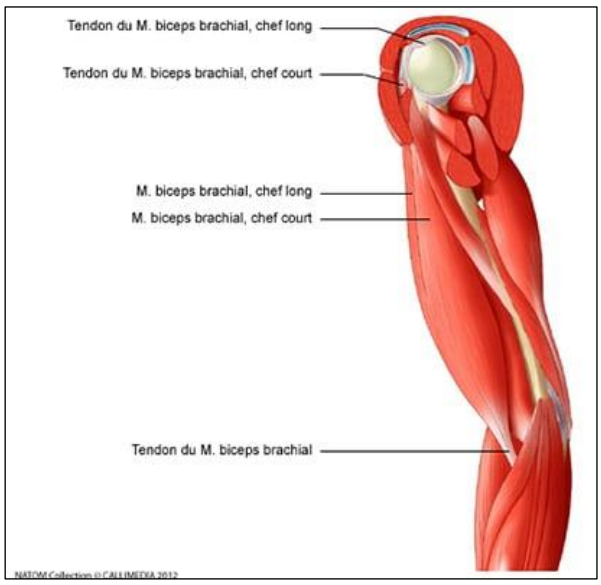

Figure 1: Anatomy of the brachial biceps tendon

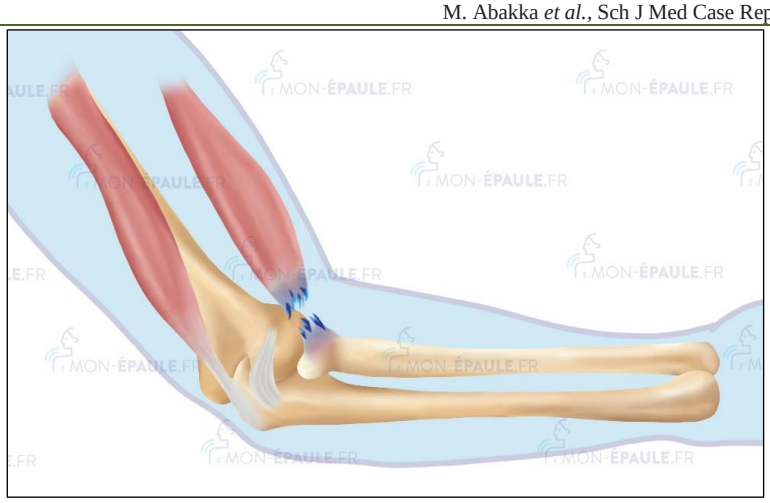

Figure 2: Rupture of the brachial biceps tendon

CLINICAL CASE

This is a 36-year-old patient who, lifting a load heavy, elbow flexed at 90◦ and forearm supinated a felt very intense pain in the front of the elbow.

The clinical examination then found a tendinous gap at the level of the elbow with reduced supination strength. There plain x-ray was normal. Ultrasound of the soft tissues of the forearm and elbow as well as MRI have objectified a disinsertion of the bicipital tendon at the level of the bicipital tuberosity.

The patient underwent surgery and benefited from reinsertion of the tendon at the level of the bicipital tuberosity of the radius by an endobutton via a single anterior approach.

After identification and lacing of the distal end of the tendon and its attachment to the endobutton, we proceeded to create a small tunnel within the bicipital tuberosity whose largest diameter is at the level of the anterior cortex. An eyed pin helps to guide the passage of the endobutton through the tunnel thanks to its two peripheral wires.

The endobutton is oriented horizontally behind the posterior cortex of the radius under scopic control, which keeps the end of the tendon anchored at the level of its bony insertion.

The limb was then immobilized in a brachioantebrachiopalmar splint, the elbow at 90◦ for four weeks.

Rehabilitation was then started from the first week with an isometric rehabilitation then passive and active mobility from removal of the splint.

The resumption of professional activity took place in three months. After a follow-up of three years, the patient does not report any functional limitation.

Figure 3: Clinical image of our patient with brachial biceps tendon rupture

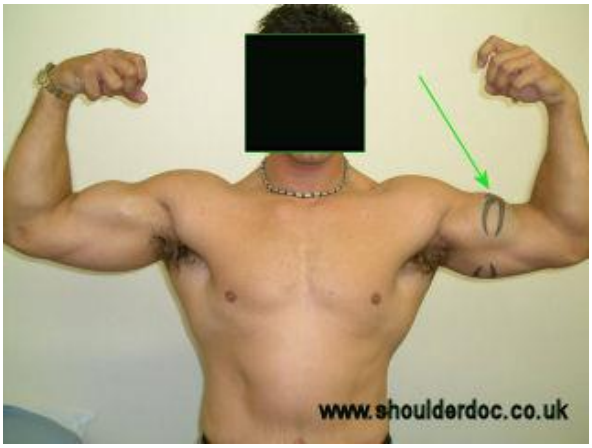

Figure 4: Retraction of the biceps brachial muscle due to the rupture of his tendon

Figure 5: Profile X-ray of the elbow without detectable anomaly

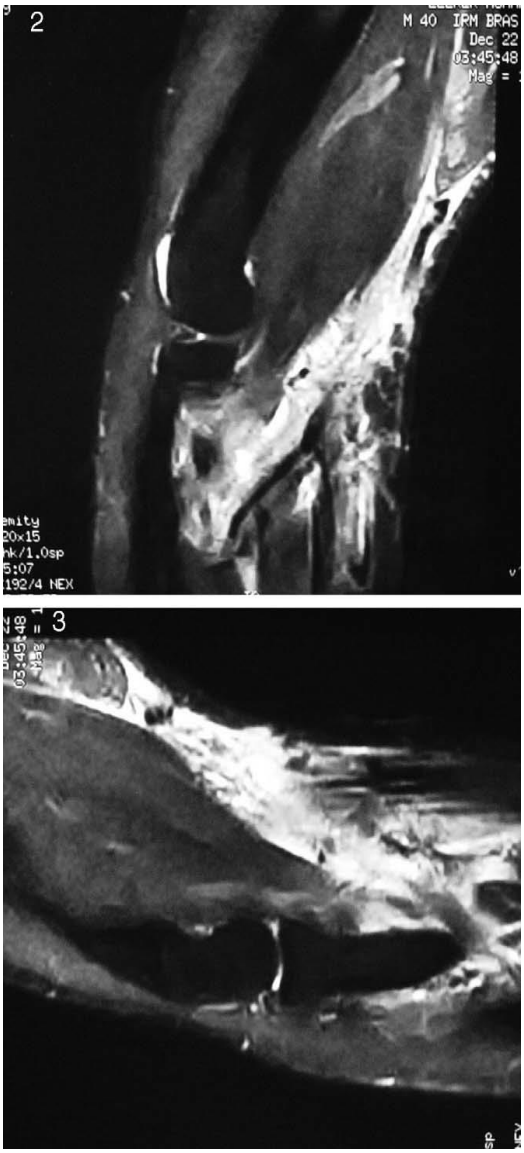

Figure 6: MRI of the elbow: disinsertion of the bicipital tendon at the level of the bicipital tuberosity

Figure 7: Postoperative control X-ray showing the reinsertion hole of the tendon and the final appearance of the endobutton

DISCUSSION

Disinsertion of the distal tendon of the biceps brachial is a rare described pathology in the literature. Most series published include less than ten patients operated on by the same crew. This explains the wide variety of treatments offered since the first surgical cure by Dobbie.

This lesion is found almost exclusively in men between 30 and 50 years old and exercising a physical activity important such as that of forced laborers or athletes. In 70% of cases, there is an opposition mechanism to active flexion or passive extension of the elbow.

Muscle contraction against applied resistance results in a tearing of the tendon insertion. The degenerative process is only rarely the cause of rupture.

The elements of the diagnosis are based on the anamnesis specifying the mechanism of rupture and on the clinical examination, which will evidence of either a hematoma or a swelling or lacuna tendon at the bend of the elbow as well as a decrease supine strength. Subsequently, the diagnosis is difficult to ask because the table becomes misleading and rarely worries the patient. Complementary examinations are then of a capital importance.

Standard X-ray can rule out a fracture or tearing at the level of the bicipital tuberosity, which is exceptional. Meherin and Kilgore reported only one case.

Ultrasound is very effective to make the diagnosis, according to a study by Weiss *et al.*, MRI distinguishes total ruptures of tenosynovitis or tendinitis.

Surgical treatment is always indicated to recover good elbow flexion and supination strength; that is proven by several biomechanical studies. Morey *et al.*, have demonstrated that orthopedic treatment caused a 60% loss of strength for flexion and supination. The non-surgical treatment is reserved for sedentary patients or patients with great operative risk.

The choice of surgical technique is important and depends the time elapsed between the accident and the surgery.

The greater this is, the more the tendon will be retracted. Anatomical reinsertion will be impossible and a suture to the tendon of the brachialis muscle will be necessary.

The modified double track by Morrey prevented involvement of the posterior branch of the radial nerve. In his series of 51 interventions, Dobbie reported two radial nerve palsies with a single pathway anterior. The danger comes, according to Boucher and Mortin because of the retraction, which compresses the deep branch of the radial nerve, when exposing the radial bicipital tuberosity. The attack of the nerve would be avoidable by better exposing it, obtained by severing the radial recurrent artery and leaving the posterior motor branch of the radial nerve under the muscle short supinator, which will be reclined. Moosmayer *et al.*, reviewed nine patients operated on using the dual approach of Boyd and Anderson.

They counted two temporary damage to the radial nerve that they also put on the account of the spacer compressing the deep branch of the radial nerve. The double track first presents the risk of ossification of the tendon insertion and radioulnar synostosis; anatomical reinsertion on the bicipital tuberosity has advantages such as report Boyd and Anderson restoring supination strength.

The dynamometric study of the series by Gennari *et al.*, shows that anatomical reinsertion

restores in 83% a physiological supination strength and range of motion in normal supine flexion. Morey *et al*., find them also that an anatomical reinsertion allows these six patients to recover a flexion force exceeding 90% of normal and supination greater than 80%. The only case of brachialis suture anterior showed a loss of supination flexion of 45%.

Baker and Bikewagon also present ten cases of reintegration successful radial with good restoration of pronosupination.

Bone anchors are part of the surgical arsenal for the reinsertion of the distal bicipital muscle with good results.

In this case, we can limit ourselves to an exclusively anterior approach. Bain *et al*., described a technique using an endobutton with a single anterior approach that they have performed on 12 patients without per- and postoperative complications.

Bell *et al*., reviewed 28 distal bicipital tears including 21 anatomical reinsertions. Among these were 11 lacing of the tendinous stump and passage of the two threads through a pre-dug niche, five screw fixings and five fixations by bone anchors. They concluded, while admitting that their collective was weak, that there was no difference between these three fixing techniques.

CONCLUSION

Our study confirms the quality of the clinical result and affirms the quality of tendon/cortical bone healing, in reinsertions of the distal tendon of the biceps brachial muscle by endobutton.

The restoration of mobility is in the big majority of complete cases and restoration of strength is incomplete but sufficient not to generate any sequelae in the daily life of our patients. The way of a single anterior approach avoids the risk of proximal radioulnar synostosis by respecting the interosseous membrane, but exposes to a significant risk of neurological complications, in most cases benign (paresthesia) and self-limiting movements.

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