Int. j. adv. multidisc. res. stud. 2024; 4(5):333-334

Received: 03-08-2024
Accepted: 13-09-2024

International Journal of Advanced Multidisciplinary Research and Studies

ISSN: 2583-049X

Distal Biceps Tendon Rupture Requires an MRI to Determine Whether Injury is Complete or Incomplete and the Extent of Secondary Damage

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DOI: https://doi.org/10.62225/2583049X.2024.4.5.3238
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Abstract
Proximal or distal biceps tendon ruptures are a common problem in traumatology, but their diagnostic and therapeutic management varies greatly and does not follow universal standards. Diagnosis of distal biceps tendon ruptures by point-of-care ultrasound is a promising approach, but has some drawbacks. Compared to MRI, ultrasound cannot reliably document the secondary damage caused by the rupture and is also not suitable for distinguishing between complete and incomplete rupture. Therefore, it is desirable to assess the sensitivity and specificity of point-of-care ultrasound for diagnosing distal biceps tendon ruptures through a prospective, multicentre study using MRI as the gold standard for comparison.

Keywords: Tendon Rupture, Distal Biceps Tendon, Magnetic Resonance Imaging, Point-of-Care Ultrasound, Testosterone

Introduction

We read with interest the article by Ali *et al*. about a 34-year-old previously healthy man who suffered a rupture of the left distal biceps tendon (BTR) following a martial arts activity [1]. He suffered from arm pain, bruising on the medial side of the distal left arm and the ventral side of the proximal forearm, tenderness in the antecubital fossa, and inability to flex the elbow [1]. The hook test was positive and the distal BTR could be documented using point-of-care ultrasound [1]. Within a week after the trauma, the patient was treated surgically [1]. The study is impressive, but some points require further discussion.

The first point is that the design of the study (case report) does not allow general and definite conclusions about the sensitivity and specificity of a diagnostic method such as point-of-care ultrasound for the assessment of musculoskeletal injuries [1]. To assess the usefulness of a diagnostic method such as point-of care ultrasound prospective studies and comparison of the method with a gold standard such as the muscle magnetic resonance imaging (MRI) are imperative. MRI also makes it easier to identify consequential damage from a tendon rupture, such as vascular damage, cartilage damage, connective tissue damage, and hematomas. Although point-of care ultrasound is more readily available than muscle MRI, the latter should be preferred over ultrasound, especially given that tendon ruptures often require surgical intervention. MRI also makes it easier to distinguish whether the rupture was complete or incomplete.

A second point is that it is not mentioned whether the index patient regularly used illicit drugs or not. It is also not mentioned whether the patient regularly took anabolic steroids, in particular testosterone. Testosterone is known to be associated with an increased risk of BTR [2]. In a retrospective cohort study of 776,974 patients who had filled a prescription for testosterone for at least 3 consecutive months, 650 patients experienced distal BTR compared to 159 patients among 291619 controls [2]. Patients with testosterone use were more than twice as likely to experience distal BTR as matched controls [2]. Patients who filled testosterone prescriptions were also more likely to undergo surgical repair within one year of the injury compared to controls [2]. Therefore, the index patient's testosterone levels should have been measured.

A third point is that the outcome was not reported. We should know whether the operation was successful and whether the patient regained full muscle strength for forearm flexion. In a retrospective chart review of 60 patients with distal BTR (38 completely and 22 partially) 34 with complete rupture were treated surgically and four with complete rupture non-operatively [3]. Of those with incomplete rupture, 11 were treated surgically and 11 were treated nonsurgically [3]. At an average follow-up of 5.4 years, patients with complete distal BTR achieved overall similar improvements in American Shoulder and Elbow Surgeons (ASES) pain, ASES function, Single Assessment Numeric Evaluation (SANE), and Disabilities of the Arm, Shoulder

and Hand (DASH) scores, regardless of whether they were treated operatively or nonsurgically [3].
A fourth point is that it was not mentioned whether the distal BTR was complete or incomplete in the index patient.
In conclusion, MRI should be performed in patients with distal BTR to determine whether the rupture is complete or incomplete and to assess the extent of secondary injuries. The long-term outcome should be reported regardless of whether distal BTR is treated conservatively or surgically.

Declarations
Ethical approval: Not applicable.

Consent to participation: Not applicable.

Consent for publication: Not applicable.

Funding: None received.

Availability of data and material: All data are available from the corresponding author.

Completing interests: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Author contribution: JF was responsible for the design and conception, discussed available data with coauthors, wrote the first draft, and gave final approval. SM: Contributed to literature search, discussion, correction, and final approval.

Acknowledgements: None.

Keywords: Tendon Rupture, Distal Biceps Tendon, Magnetic Resonance Imaging, Point-of-care Ultrasound, Testosterone

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