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Case Report

Surgical decompression of an accessory bicipital aponeurosis associated with median neuropathy in the antecubital fossa: A case report

Mark Richard Kraemer[1], Mark D. Corriveau[1], Michael J. Tuite[2], Amgad S. Hanna[1]

[1]Department of Neurosurgery, University of Wisconsin School of Medicine and Public Health, [2]Department of Radiology, University of Wisconsin, Madison, Wisconsin, United States.

E-mail: Mark Richard Kraemer - mkraemer@uwhealth.org; Mark D. Corriveau - mcorriveau@uwhealth.org; Michael J. Tuite - mtuite@uwhealth.org; *Amgad S. Hanna - ah2904@yahoo.com

***Corresponding author:**
Amgad S. Hanna, MD, Department of Neurosurgery, University of Wisconsin, 600 Highland Avenue, MC 8660, Rm K4/830, CSC, Madison, WI 53792, USA.

ah2904@yahoo.com

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ABSTRACT

Background: Accessory muscles in the arm are well-known anatomical variants which have been hypothesized as sources of neurovascular compression syndromes. We report a rare presentation of neuropathy secondary to an accessory biceps aponeurosis causing compression of the median nerve in the antecubital fossa.

Case Description: A 65-year-old man presented with a 5-year history of numbness and pain associated with arm flexion. Electromyography was normal and exam revealed mild weakness in the median nerve distribution; however, magnetic resonance imaging demonstrated an accessory biceps tendon overlaying the median nerve in the antecubital fossa. The patient underwent surgical decompression of the median nerve with detachment of the accessory tendon resulting in clinical improvement.

Conclusion: Anomalous biceps musculature should be considered in the workup and treatment of proximal median neuropathy.

Keywords: Accessory biceps, Anomalous musculature, Median nerve, Median neuropathy, Peripheral nerve

INTRODUCTION

Neurovascular entrapment syndromes of the median nerve are common. At the elbow, there are several well-known sources of entrapment: The ligament of Struthers, thickening of the distal biceps aponeurosis, compression between the two heads of the pronator teres muscle, and thickening of the flexor digitorum superficialis.[4] Rare causes of compression include anomalous musculature, including the accessory flexor pollicis longus head (Gantzer's muscle) and the sublime bridge.[8] Variant biceps musculature has also been proposed as a possible source of median nerve compression.[5,6] Anomalous biceps muscles are commonly reported in cadaveric studies, with a prevalence of 5–15%.[3] Although accessory muscles are normal anatomic variants and usually asymptomatic, they may be pathologic. We describe an interesting case of proximal median nerve entrapment associated with an accessory biceps aponeurosis overlaying the median nerve in the antecubital fossa.

CLINICAL PRESENTATION

This report was exempt from Institutional Review Board approval and patient consent was obtained. A 65-year-old man presented with 5 years of sharp, shooting pains radiating from the right medial epicondyle into the thenar eminence and thumb. Symptoms occurred after 10–15 min of elbow flexion and were relieved with extension. There were no previous injuries and no changes in activity patterns. Since the onset of symptoms, he took extra precaution to sleep with his arm extended and avoid long periods of elbow flexion. Medical and surgical history was unremarkable. In his initial workup, he underwent X-ray imaging, electromylography (EMG), and occupational therapy. Both the EMG and X-rays were normal. Due to persistence of symptoms despite occupational therapy, he was referred for surgical consultation with an MRI.

On examination, the patient had normal tone and muscle bulk. However, there was median distribution weakness involving the abductor pollicis brevis 4+, lateral flexor digitorum profundus 4+, and opponens pollicis 4+. Scratch collapse was positive over the pronator quadratus. There was a Tinel sign at the elbow crease medial to the biceps tendon. Radial pulse weakened with elbow flexion. Sensation was normal.

MR neurogram of the median nerve at the right elbow demonstrates a small accessory band of the biceps tendon that begins at the distal biceps muscle and travels for a short length next to the neurovascular bundle [Figure 1]. By MR, there is no evidence of median nerve deformation. An ultrasound was performed in both elbow flexion and extension. There is no sonographic evidence of morphologic distortion of the median nerve during these maneuvers.

After reviewing symptoms, exam, and imaging, the patient was offered median nerve exploration and decompression at the elbow [Video 1]. To avoid crossing the elbow crease, two incisions were planned. One incision was made medial to the biceps in the arm and another in the ventral forearm [Figure 2]. Alternatively, a single incision crossing the antecubital fossa may be used. Leads were placed in the thenar, hypothenar, and brachioradialis for intraoperative nerve monitoring. The median nerve was first exposed proximally in the groove behind the biceps brachii. The distal incision was then opened and the bicipital aponeurosis was identified. Under direct vision, the biceps aponeurosis was divided from proximal to distal underneath the intervening skin. A tight accessory limb of the bicipital aponeurosis was identified overlaying the median nerve and inserting into the fascia of the pronator teres muscle [Figure 3]. A nerve stimulator was used to confirm the absence of nerve within the tissue before it was divided. The median nerve was circumferentially decompressed to ensure there were no further areas of entrapment.

At 1 month follow-up, he reported complete resolution of pain in the hand and forearm. On exam, strength improved to 5/5 throughout the limb. The patient was very pleased with the outcome and declined further occupational therapy. He followed up in clinic at 3–12 months with continued relief of pain.

DISCUSSION

Surgical decompression of the median nerve at the elbow is a standard operation in nerve surgery. We report a variation on this technique using two separate incisions. The wide exposure above and below the elbow affords good exposure of the median nerve, anterior interosseous nerve, brachial artery, and any intervening compressive structures. This approach does not significantly limit exposure, yet avoids crossing the antecubital fossa and associated wound healing difficulties.

Anomalous musculature is not commonly considered in the evaluation and treatment of median neuropathy. Yet, cadaveric studies demonstrate a surprisingly high prevalence of accessory musculature in the arm. Although hypothesized as a possible source of neurovascular entrapment, to the best of our knowledge, this is the first reported surgical decompression of an accessory biceps aponeurosis at the

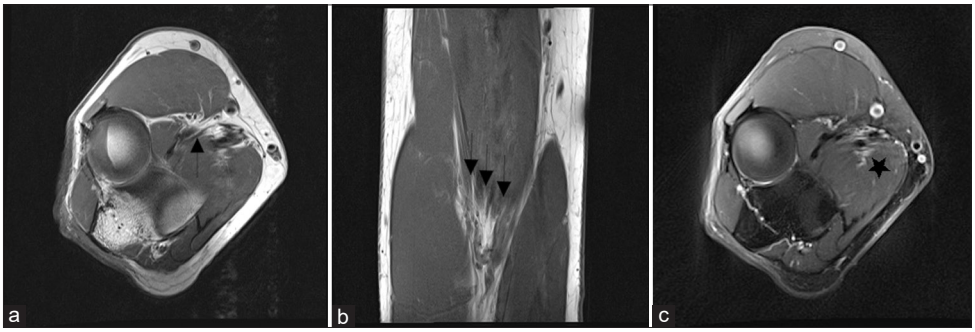

Figure 1: Preoperative MR neurogram of the right elbow. Axial T1 MR images (a) demonstrating a thin fat pad (arrow) between the biceps aponeurosis and underlying neurovascular bundle. (b) T1 coronal MR imaging demonstrates three distinct tendons forming the biceps aponeurosis (three arrows). (c) T2 axial demonstrates subtle enhancement of the median nerve (star).

Figure 2: Operative approach. Two incisions were planned, one rostral to the elbow crease and medially oriented and the second distal to the elbow. This avoids an incision crossing the elbow crease. The intervening skin is lax and easy to retract so that there was no compromise to visibility.

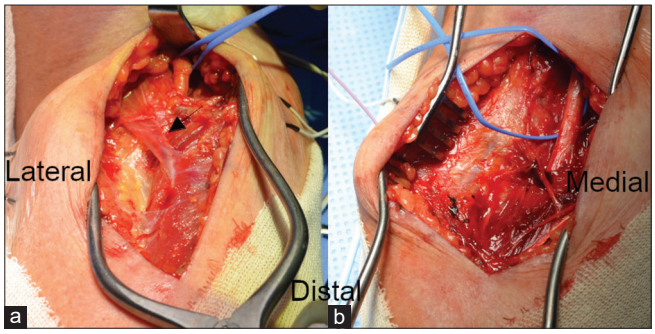

Figure 3: Intraoperative view of accessory biceps aponeurosis (arrow) coursing lateral to medial overlaying the median nerve (blue loop) pre decompression (a) and post decompression (b).

elbow for median neuropathy. Anomalous biceps brachii muscles may arise in tandem with either the long head or short head of the muscle;[1,3] however, additional origins including the intermuscular septum, humerus, and the fascia of adjacent muscles have also been reported.[5,6] The accessory muscle may insert at varying points along the distal humerus and/or proximal radius with multiple potential regions of entrapment for brachial artery and median nerve.

Anomalous musculature is present from birth and shapes regional anatomy during development. Therefore, the most individuals accommodate accessory musculature without symptoms. Interestingly, this patient presented with symptoms in his fifth decade, which was elicited with elbow flexion. This is in contrast to other provocative maneuvers used to differentiate compressive neuropathies in the arm, including prolonged and/or repetitive pronation in pronator teres syndrome. Although not present in this case, changes in muscle bulk, activity patterns, and/or trauma are other common reasons for new symptomatology. Furthermore, symptoms may be due to a combination of both median nerve and arterial compression. In the absence of new mass lesions, it is unexpected to see changes in trajectory of the median nerve. However, the arterial vasculature often becomes more tortuous with aging.[2] Therefore, changes in the course of the brachial artery may have precipitated symptoms, as reported in other peripheral neuropathies.[8] Finally, it is possible the accessory muscle is incidental. The decompression performed was extensive with division of the biceps aponeurosis and generous exposure of the median nerve underneath the pronator teres. Although we suspect the anomalous biceps was culpable, we agree surgery should be aimed at evaluating and treating all possible areas of entrapment.[2]

CONCLUSION

Anomalous biceps musculature should be considered in the workup and treatment of proximal median neuropathy.

Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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