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Lateral antebrachial cutaneous nerve compression after traumatic rupture of the long head of the biceps: a case series



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Background: Lateral antebrachial cutaneous (LABC) nerve compression is a rare but debilitating injury. There are limited data on the association of LABC nerve compression and proximal biceps rupture. We theorized that because of distal migration, the biceps muscle and tendon cause compression on the nerve.

Methods: We present 2 cases in which patients had proximal biceps ruptures with tendon retraction and developed neurologic symptoms associated with the LABC nerve. To demonstrate our theory, we performed a cadaveric experiment. After making an incision to expose the entire biceps muscle and the musculocutaneous nerve and its branch into the LABC nerve, we marked each structure in 2-cm increments with a marking pen. The long head of the biceps was then cut to simulate a proximal biceps rupture.

Results: The relationship between the 3 structures was then studied, showing no change in position of the musculocutaneous nerve or LABC nerve. The biceps muscle and tendon had migrated distally toward the LABC nerve, demonstrating compression of the nerve.

Conclusion: Proximal biceps tears commonly occur from trauma as well as iatrogenically after a biceps tenotomy for treatment of biceps tendinopathy. However, it is unusual for neuropathy of the LABC nerve to occur. Patients who develop neuropathy associated with the LABC nerve after a proximal biceps rupture can be effectively treated with LABC nerve decompression and biceps plasty. We found that this was an effective surgical treatment of LABC neuropathy without the need for proximal biceps tenodesis.

Level of evidence: Level IV, Case Series, Treatment Study.

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Keywords: Lateral antebrachial cutaneous nerve; biceps; elbow pain

Lateral antebrachial cutaneous (LABC) nerve compression is a rare but debilitating injury. It most commonly is manifested as numbness or neuropathic pain over the elbow

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IRB: The Indiana University Human Subjects Office did not consider this a research study because there is no hypothesis and stated that the submission did not need IRB approval.

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and lateral aspect of the forearm. Patients typically have a history of injury or overuse of the elbow involving extension and maximal pronation of the elbow with activities such as weightlifting and tennis. Narasani¹¹ initially defined the diagnosis, and Bassett and Nunley² later described the pathologic process in which the nerve is compressed by the biceps aponeurosis and tendon against the fascia of the brachialis muscle. There are limited data on the association of LABC nerve compression and proximal biceps rupture. Brogan et al³ described it as traction neuritis, rather than entrapment, as they believed that the biceps displaced the

nerve laterally. Therefore, their treatment algorithm involved a proximal biceps tenodesis as the mainstay of treatment in addition to neurolysis of the LABC nerve. We present 2 cases of LABC neuropathy after traumatic proximal biceps tendon rupture. Both cases were treated with decompression of the LABC nerve distally, including a biceps plasty without proximal biceps tenodesis. We theorized that because of distal migration, the biceps muscle and tendon cause compression on the nerve (Fig. 1). To demonstrate, we simulated a traumatic biceps rupture in a cadaver specimen and investigated the relationship between the biceps muscle and tendon and the LABC nerve to provide more evidence to support this theory.

Case report 1

A 58-year old, right-hand dominant male manual laborer, with no previous history of shoulder or elbow injury, presented to the clinic with a 2-month history of left shoulder pain after he felt a “pop” while cutting and hauling wood. Before his orthopedic presentation, he presented to his primary care physician and was given anti-inflammatory medication. He was referred for continued left shoulder pain. On examination, he had full range of motion and normal abduction/external rotation strength; the Hawkins impingement sign was present. The biceps muscle belly was prominent and had migrated distally. Because of the patient’s continued pain, magnetic resonance imaging (MRI) of the shoulder was ordered. This showed rotator cuff tendinosis and an intra-articular rupture of the long head of the biceps tendon with retraction and an empty bicipital groove. He was then given a subacromial injection and was prescribed a structured physical therapy program. The patient returned 6 weeks after his initial presentation with resolution of shoulder pain but had developed point tenderness at the lateral aspect of the distal biceps with paresthesias at the lateral aspect of the forearm without numbness. He had decreased grip strength because of pain. At that time, he was diagnosed with compression of the LABC nerve, and an injection of corticosteroid was performed at the point of maximum tenderness. The patient reported complete relief for approximately 2 days; however, the pain returned. He tried rest, ice, a brace, anti-inflammatory medication, and a steroid injection without complete relief. A second MRI study was performed of the elbow that showed a mass consistent with a hematoma with enhanced granulation tissue at the proximal portion of the biceps muscle.

Three months later, the patient opted for surgical intervention that included exploration and decompression of the LABC nerve at the distal musculotendinous junction with biceps plasty.

At the time of surgery, a longitudinal incision was made over the lateral aspect of the distal biceps tendon. The LABC nerve was identified as it exited just lateral to the biceps musculotendinous junction (Fig. 2). The nerve was decompressed both proximally and distally, and a biceps plasty was performed by taking the lateral side of the proximal biceps tendon and sewing it over to the medial aspect of the tendon (Fig. 3). Of note, an additional longitudinal incision was made at the proximal biceps muscle to decompress the hematoma.

The patient had complete resolution of symptoms immediately after surgery. He was released to work without restrictions 4

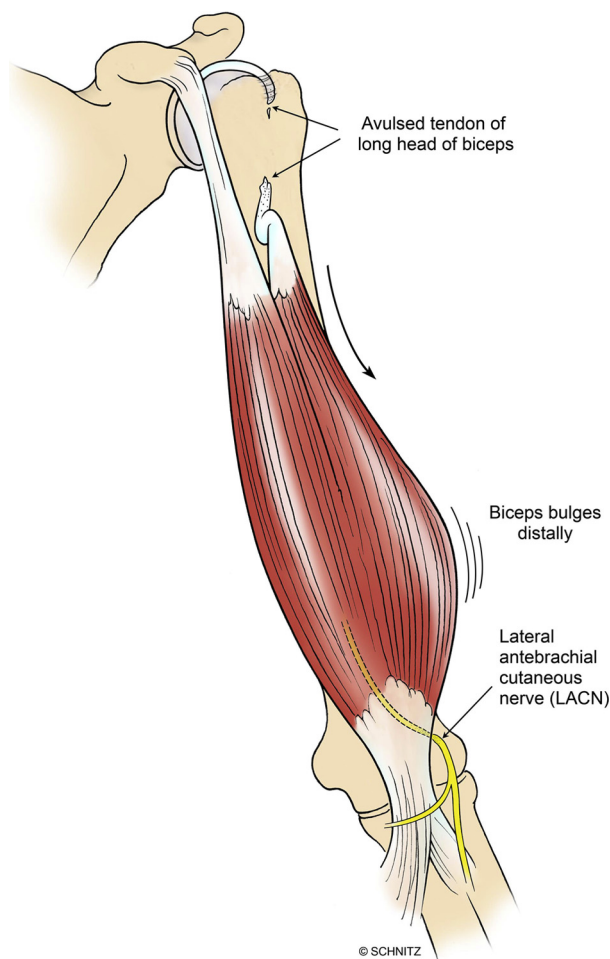


Figure 1 Schematic representation of the distal migration of the biceps muscle and tendon after proximal biceps rupture, resulting in compression of the LABC nerve.

weeks later. He has had no reported return of symptoms during the 13-month follow-up period.

Case report 2

A 50-year-old male, right-hand dominant machine operator, with no previous history of shoulder or elbow injury, presented to the orthopedic clinic with a 6-month history of right shoulder pain. He was lifting a heavy bag of fertilizer and felt a painful “pop” in his anterior shoulder. The patient reported a change in contour and intermittent pain in his biceps muscle and had a 1-month history of gradually increasing numbness and tingling in the lateral forearm. The numbness and tingling were described as originating from the lateral aspect of the biceps and radiated into the forearm and thumb. The patient had equivocal findings on shoulder examination, distal migration of the biceps muscle, and mild pain in the biceps muscle; Tinel sign was absent at the LABC nerve lateral to the biceps tendon. A nerve conduction velocity test and MRI of the elbow were ordered. The nerve conduction velocity test confirmed compromise of the LABC nerve at the distal aspect of the arm/elbow, and MRI revealed moderate distal biceps

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