

Ulnar Nerve Neuropathy Secondary to “Snapping Triceps Syndrome”

Plastic Surgery Case Studies

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journals.sagepub.com/home/pcs**Stahs Pripotnev, BMSc, MD¹ and Colin White, MD, FRCPS(C)²**

Abstract

Cubital tunnel syndrome is the second most common compression neuropathy of the upper extremity and the most common point of compression for the ulnar nerve. We present a case of ulnar nerve compression neuropathy at the elbow secondary to an abnormal subluxating medial head of triceps. A 37-year-old right hand dominant male presented with a history of bilateral medial elbow pain and ulnar distribution hand numbness. During his left cubital tunnel release surgery, the abnormal anatomy was noted. Initial subfascial anterior transposition was insufficient and had to be revised to a subcutaneous transposition intraoperatively. Failure to recognize the contribution of triceps abnormalities can lead to incomplete resolution following surgery. Surgeons should be wary of uncommon findings and adjust their approach appropriately.

Keywords

nerve, peripheral nerve, ulnar, entrapment, compression, elbow, neuropathy, cubital tunnel, triceps, snapping triceps

Introduction

Cubital tunnel syndrome is the second most common compression neuropathy of the upper extremity and the most common point of compression for the ulnar nerve.¹⁻⁴ The literature primarily lists 6 sites of ulnar nerve compression at the cubital tunnel including Osborne's ligament, the arcade of Struthers, the intermuscular septum, the flexor carpi ulnaris fascia, the anconeus epitrochlearis, and the fascial bands within the flexor carpi ulnaris distally.^{1,2} There are also rare reports of unusual findings including ulnar nerve compression secondary to anatomic variations in the triceps musculature.⁵⁻¹⁰ We present a case of ulnar nerve compression neuropathy at the elbow secondary to an abnormal snapping medial head of the triceps.

Case Report

A 37-year-old right hand dominant male presented to his family physician with a 2-month history of bilateral medial elbow pain with repetitive loaded elbow flexion and hand numbness after resting his elbows on a hard surface. His symptoms quickly resolved with rest or change in position. He reported subjective weakness with grip strength that affected his ability to exercise. He had no significant medical history otherwise.

On physical examination, he had visible and palpable ulnar nerve subluxation with active elbow flexion and extension. There was no appreciable muscle wasting. He demonstrated full asymptomatic active range of motion at the shoulder, elbow, and wrist. He had good equal strength and reflexes. Sensation was normal to light touch and pinprick.

After failing conservative management, he received a referral to plastic surgery. Further discussion elicited that the patient had been aware of his evident ulnar nerve subluxation his entire life but never considered it unusual. Following a discussion about the etiology of these symptoms, he agreed to proceed with a cubital tunnel release and ulnar nerve transposition of his left elbow.

A longitudinal incision was made directly between the olecranon and medial epicondyle extending 6 cm distally and

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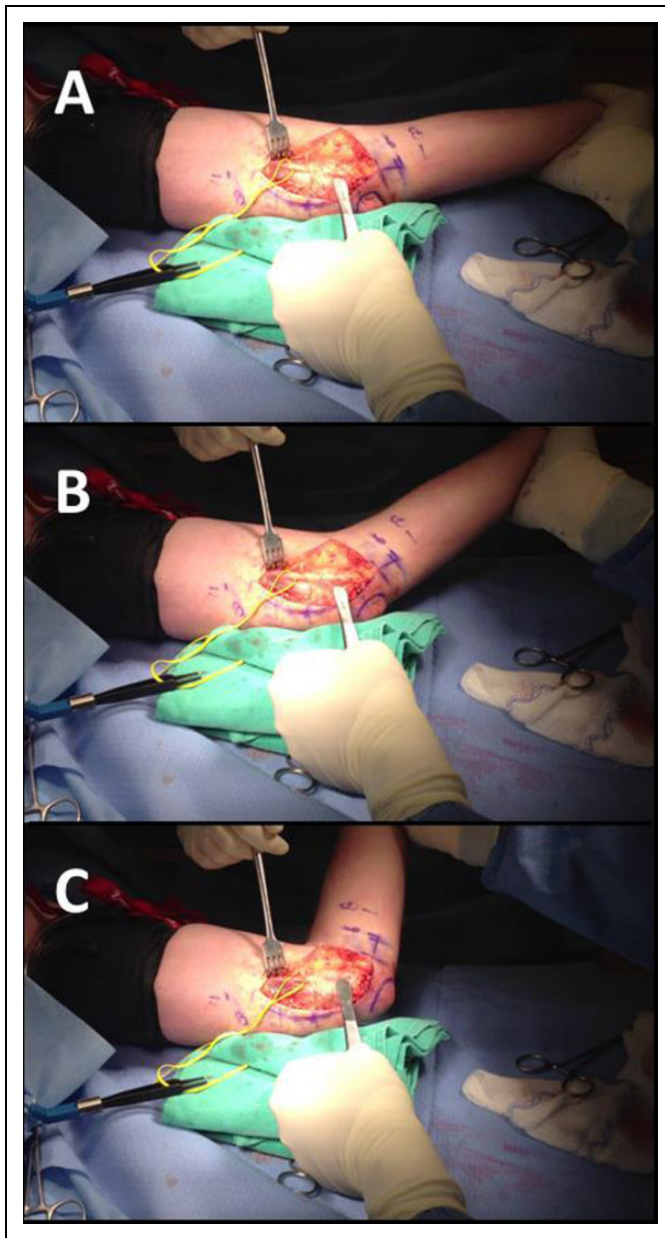


Figure 1. Intraoperative photographs showing (A) the ulnar nerve in the cubital tunnel with the elbow at 0°. B, The ulnar nerve begins to sublux over the medial epicondyle with the elbow at 45°. C, The ulnar nerve has been forced completely anterior to the medial epicondyle by the medial head of the triceps with the elbow at 90°.

8 cm proximally. Dissection was carried down through the subcutaneous tissue, and the ulnar nerve was identified underneath the fascia. The ulnar nerve was then isolated with a vessel loop and freed from the fascia to 8 cm proximally. It was at this time that the unusual anatomy was first appreciated. As the elbow was ranged, the entire medial head of the triceps moved around the medial epicondyle effectively forcing the ulnar nerve out of the groove and subluxing it forward (Figure 1). The nerve was further freed distally to the point where it dipped beneath the 2 heads of the flexor carpi ulnaris. Fascial flaps were designed with a sling to house the transposed ulnar nerve.

However, when the elbow was ranged after the transposition, the ulnar nerve was noted to kink significantly proximally where the medial head of the triceps continued to force the proximal end of the nerve anteriorly and create a 90° angle where the nerve entered the fascial flaps (Figure 2). It was clear that a subfascial anterior transposition would not suffice so a cutaneous to fascial sling was designed instead. The elbow was ranged once more with the ulnar nerve now secured subcutaneously anterior to the medial epicondyle and no further kinking or entrapment was noted (Figure 3). The skin was closed and the patient was discharged home the same day with plans for follow-up.

At his 2, 6, and 15 weeks of follow-ups, his incision was healing well with no infection and demonstrated good range of motion. He reported slowly increasing his activities to include yoga and push-ups with no recurrence of his symptoms.

Discussion

“Snapping triceps syndrome” is an uncommonly described phenomenon causing medial elbow pain. The proposed mechanism causing this syndrome involves a more distal muscular to tendinous transition of the medial head of triceps that results in a shorter interval between the medial edge of the muscle and the medial epicondyle. As the elbow is flexed, the triceps muscle is compressed against the distal humerus and widens slightly. A short interval between muscle and medial epicondyle predisposes the wider compressed triceps to subluxate anteriorly over the medial epicondyle.^{10,11} The pull of an abnormal fourth head of the triceps has also been postulated to result in a snapping triceps.¹²⁻¹⁶

Although this anatomical variation can present as medial elbow pain with repetitive flexion, it is not always associated with an ulnar neuropathy in the setting of a securely positioned ulnar nerve in the cubital tunnel. However, when the snapping triceps occurs with a subluxating ulnar nerve, the combination of the 2 mechanisms can present with an ulnar compression neuropathy. The ulnar nerve typically begins to dislocate at approximately 70° to 90°, quickly followed by medial head of triceps dislocation at approximately 115°.^{10,17}

There are very few case reports in the literature describing snapping triceps syndrome as a cause of ulnar nerve compression. Often, the dislocating triceps is initially unrecognized at the time of cubital tunnel release and results in recurrent ulnar neuropathy symptoms.¹⁸⁻²⁰ In this case, significant kinking of the ulnar nerve was noted with a traditional fascial sling so a more extensive dissection with subcutaneous sling was performed.

Multiple operative solutions exist for cubital tunnel syndrome but none have been shown to be significantly superior in the short- or long-term with regard to complications or clinical resolution of symptoms.²¹⁻²⁷ Some authors have suggested that a custom intraoperative approach should be tailored to each individual patient based on their own anatomy.²⁸ Unusual findings like those presented in this report further support a tailored intraoperative approach.

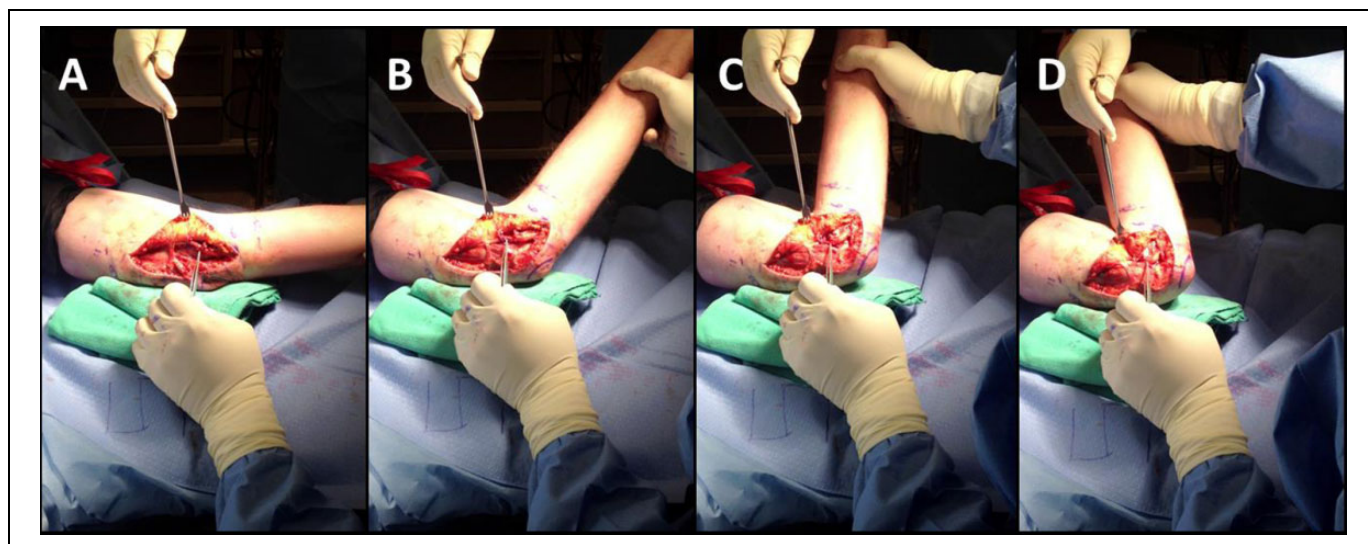


Figure 2. Intraoperative photographs showing (A) the ulnar nerve anteriorly transposed in a fascial sling with elbow at 0°. B, The ulnar nerve begins to kink proximal to its entry into the fascial sling as the medial head of triceps begins to sublunate with elbow at 45°. C, The ulnar nerve kinks further as the medial head of triceps completely sublunate anteriorly with the elbow ranged to 90° and (D) 135° of flexion.

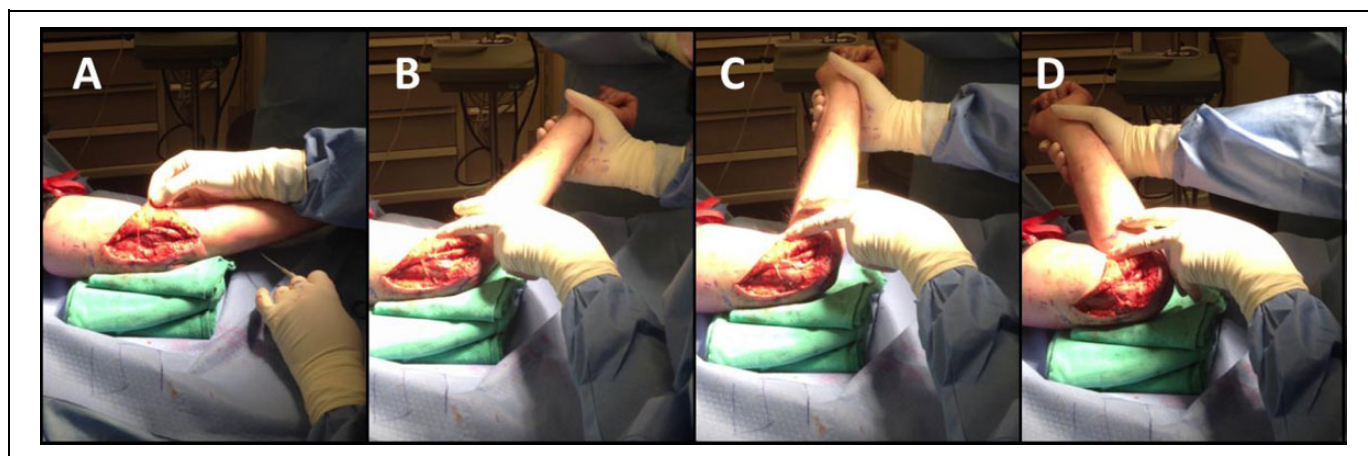


Figure 3. Intraoperative photographs showing (A) the ulnar nerve transposed anterior to medial epicondyle in a subcutaneous sling with elbow at 0°. B, The ulnar nerve remains securely transposed with no signs of kinking as the elbow is ranged to 45°, (C) 90°, and (D) 135° of flexion.

Conclusion

Abnormalities in triceps musculature are a rare cause of ulnar nerve compression neuropathy at the elbow. Failure to recognize the contribution of snapping triceps syndrome can lead to incomplete resolution or worsening of symptoms following cubital tunnel release and ulnar nerve transposition. Surgeons should be wary of this uncommon finding and adjust their operative approach accordingly.

Declaration of Conflicting Interests

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References

1. Palmer BA, Hughes TB. Cubital tunnel syndrome. *J Hand Surg Am.* 2010;35(1):153-63.
2. Wojewnik B, Bindra R. Cubital tunnel syndrome – Review of current literature on causes, diagnosis and treatment. *J Hand Microsurg.* 2009;1(2):76-81.
3. Apfelberg DB, Larson SJ. Dynamic anatomy of the ulnar nerve at the elbow. *Plast Reconstr Surg.* 1973;51(1):76-81.
4. Childress HM. Recurrent ulnar-nerve dislocation at the elbow. *Clin Orthop Relat Res.* 1975;108(1):168-173.
5. Nellans K, Galdi B, Kim HM, Levine WN. Ulnar neuropathy as a result of anconeus epitrochlearis. *Orthopedics.* 2014;37(8):e743-5.
6. Uscetin I, Bingol D, Ozkaya O, Orman C, Akan M. Ulnar nerve compression at the elbow caused by the epitrochleoanconeus muscle: a case report and surgical approach. *Turk Neurosurg.* 2014;24(2):266-271.

7. Morgenstein A, Lourie G, Miller B. Anconeus epitrochlearis muscle causing dynamic cubital tunnel syndrome: a case series. *J Hand Surg Eur Vol.* 2016;41(2):227-229. pii: 1753193414559491.
8. Abe Y, Saito M. A case report of acute cubital tunnel syndrome caused by venous thrombosis. *Hand Surg.* 2015;20(1):137-139.
9. Satteson ES, Li Z. Anteriorly positioned ulnar nerve at the elbow: a rare anatomical event: case report. *J Hand Surg Am.* 2015;40(5):984-986.
10. Vanhees MKD, Geurts GF, van Riet RP. Snapping triceps syndrome: a review of the literature. *Shoulder & Elbow.* 2010;2(1):30-33.
11. Spinner RJ, An KN, Kim KJ, Goldner RD, O'Driscoll SW. Medial or lateral dislocation (snapping) of a portion of the distal triceps: a biomechanical, anatomic explanation. *J Shoulder Elbow Surg.* 2001;10(6):561-567.
12. Nayak SR, Krishnamurthy A, Kumar M, Prabhu LV, Saralaya V, Thomas MM. Four headed biceps and triceps brachii muscles with neurovascular variation. *Anat Sci Int.* 2007;83(2):107-111.
13. Tubbs RS, Salter EG, Oakes WJ. Triceps brachii muscle demonstrating a fourth head. *Clin Anat.* 2006;19(7):657-660.
14. Fabrizio PA, Clemente FR. Variation in the triceps brachii muscle: a fourth muscular head. *Clin Anat.* 1997;10(4):259-263.
15. Cheema P, Singla R. Four headed triceps brachii muscle. *Int J Anat Var.* 2011;4(1):43-44.
16. Swamy R, Rao M, Somayaji S, Raghu J, Pamidi N. Bilateral additional slips of triceps brachii forming osseo-musculo-fibrous tunnels for ulnar nerves. *Ann Med Health Sci Res.* 2013;3(3):450-452.
17. Łasecki M, Olchowcy C, Pawluś A, Zaleska-Dorobisz U. The snapping elbow syndrome as a reason for chronic elbow neuralgia in a tennis player—MR, US and sonoelastography evaluation. *Pol J Radiol.* 2014; 79:467-471.
18. O'Hara JJ, Stone JH. Ulnar nerve compression at the elbow caused by a prominent medial head of the triceps and an anconeus epitrochlearis muscle. *J Hand Surg Br.* 1996;21(1):133-135.
19. Spinner RJ, O'Driscoll SW, Jupiter JB, Goldner RD. Unrecognized dislocation of the medial portion of the triceps: another cause of failed ulnar nerve transposition. *J Neurosurg.* 2000;92(1):52-57.
20. Spinner RJ, Goldner RD. Snapping of the medial head of the triceps and recurrent dislocation of the ulnar nerve. Anatomical and dynamic factors. *J Bone Joint Surg Am.* 1998;80(2):239-247.
21. Boone S, Gelberman RH, Calfee RP. The management of cubital tunnel syndrome. *J Hand Surg Am.* 2015;40(9):1897-1904.
22. Siegel DB. Submuscular transposition of the ulnar nerve. *Hand Clin.* 1996;12(2):445-448.
23. Plancher KD, McGillicuddy JO, Kleinman WB. Anterior intramuscular transposition of the ulnar nerve. *Hand Clin.* 1996;12(2):435-444.
24. Osterman AL, Davis CA. Subcutaneous transposition of the ulnar nerve for treatment of cubital tunnel syndrome. *Hand Clin.* 1996;12(2):421-433.
25. Bacle G, Marteau E, Freslon M, et al. Cubital tunnel syndrome: comparative results of a multicenter study of 4 surgical techniques with a mean follow-up of 92 months. *Orthop Traumatol Surg Res.* 2014;100(4 suppl):S205-S208.
26. Liu CH, Wu SQ, Ke XB, et al. Subcutaneous versus submuscular anterior transposition of the ulnar nerve for cubital tunnel syndrome: a systematic review and meta-analysis of randomized controlled trials and observational studies. *Medicine (Baltimore).* 2015;94(29):e1207.
27. Chen HW, Ou S, Liu GD, et al. Clinical efficacy of simple decompression versus anterior transposition of the ulnar nerve for the treatment of cubital tunnel syndrome: a meta-analysis. *Clin Neurol Neurosurg.* 2014;126:150-155.
28. Keith J, Wollstein R. A tailored approach to the surgical treatment of cubital tunnel syndrome. *Ann Plast Surg.* 2011;66(6):637-639.