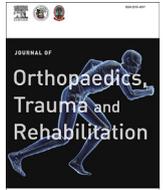




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## Case Report

## Acute Cubital Tunnel Syndrome Secondary to Anconeus Epitrochlearis Muscle



## 由肘肌滑車上肌導致的急性肘管綜合症

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## ABSTRACT

Cubital tunnel syndrome is the most common type of ulnar nerve entrapment that usually associates with chronic sensory and motor symptoms. Having anconeus epitrochlearis muscle is an uncommon cause of cubital tunnel syndrome. In this paper, the author introduces a case of cubital tunnel syndrome due to anconeus epitrochlearis muscle presenting with acute sensory, motor, and sympathetic symptoms. For such cases, there has been much controversy over the choices of surgical treatment, which can be excision of the muscle alone or together with ulnar nerve anterior transposition.

## 中文摘要

肘管綜合症是最常見的尺神經卡壓類型，病人通常表現出慢性的感覺和運動神經症狀。而因擁有肘肌滑車上肌並導致肘管綜合症是較為少見的。在本文中，作者將描述一由肘肌滑車上肌引起的急性肘管綜合症病例，當中病人展現急性感覺，運動及交感神經症狀。在這種情況下，手術治療的種類包括單獨肌肉切除術或夥同尺神經前移術，但兩者之間的選擇一直具爭議性。

## Introduction

Ulnar nerve travels through the cubital tunnel bounded by the medial epicondyle, the olecranon, the elbow joint capsule, the posterior band of the medial collateral ligament, and the aponeurosis of the two heads of the flexor carpi ulnaris (FCU). With flexion of the elbow, structures such as the aponeurosis become taut and may compress the ulnar nerve, causing cubital tunnel syndrome (CuTS). Potential sites for cubital tunnel compression include the arcade of Struthers, the medial intermuscular septum, the medial epicondyle, the Osborne's ligament, the anconeus epitrochlearis, and the deep flexor aponeurosis.

CuTS is the most common type of ulnar nerve entrapment, and it is second only to carpal tunnel syndrome among upper limb compressive neuropathies. The progression of CuTS is usually slow with several stages. These include sensory symptoms due to dynamic compression, sensory symptoms due to static compression, muscle weakness, and muscle atrophy. However, diseases such as gout,<sup>1</sup> pseudogout,<sup>2</sup> and hemangioma<sup>3</sup> may lead to acute CuTS. The clinical picture depends on the severity of compression.

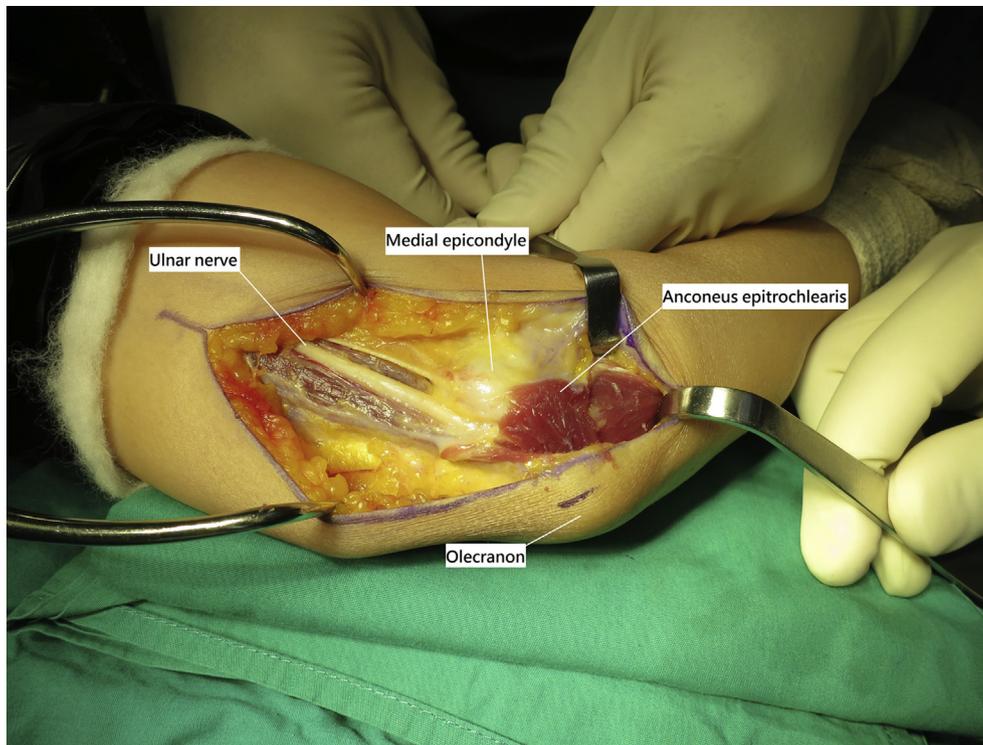
In this paper, a particular case of acute CuTS secondary to anconeus epitrochlearis is reported.

## Case report

A 52-year-old right-handed female nurse complained of numbness in her left ring and little fingers for 1 week. She then progressively developed neuropathic pain, hotness, and weakness of the left hand. She denied any recent injuries or undergoing any weightlifting training.

The initial physical examination showed swelling of the left ring and little fingers without atrophy of thenar, hypothenar, and interosseous muscles. Impairment to light touch sensation was found in the left little finger and at the ulnar side of the left ring finger. Weaknesses in FCU, flexor digitorum profundus of the ring and little fingers, finger abduction, and adduction were elicited (power grade 4-/5, 4-/5, 4-/5, 0/5, and 0/5, respectively) together with positive Froment sign. Tinel's signs were negative in both the Guyon's canal and cubital tunnel. Elbow flexion test did not show any increase in hand numbness, and the active range of movement of the elbow was full. Adson's test, Spurling's test, and myelopathic hand sign were all negative. All these results revealed that the

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**Figure 1.** Intraoperative photograph shows compression of the ulnar nerve by the anconeus epitrochlearis in between the medial epicondyle and the olecranon.

patient was experiencing ulnar nerve palsy with no specific signs of CuTS.

A nerve conduction test was conducted. No wave form was detected in the left ulnar nerve motor conduction on maximal stimulation at the wrist, below the elbow, and above the elbow level. There was also no significant wave form in left ulnar sensory conduction. An X-ray scan of the left elbow did not show any osteoarthritis change or space-occupying lesion. Blood tests including fasting blood sugar and autoimmune markers all yielded normal results. Although the clinical findings were not classical for CuTS at this juncture, the acute ulnar nerve palsy was still most likely to have originated from the cubital tunnel. Finally, the decision was made to have surgical exploration and anterior transposition of the left ulnar nerve for the patient because of the acute onset of symptoms and failure to respond to 1 week of conservative treatment.

The operation was performed 3 weeks after the onset of symptoms. Surgical exploration confirmed that the ulnar nerve was compressed by anconeus epitrochlearis in between the medial epicondyle and the olecranon (Figure 1). Nerve constriction was observed underneath the muscle. The anconeus epitrochlearis was excised together with the medial intermuscular septum. The Osborne ligament and the FCU fascia were also incised, and then the ulnar nerve was transposed anteriorly at the subcutaneous plane. Instruction was given to the patient to have active and passive range of movement exercise of the elbow as tolerated.

At Day 1 after the operation, the patient experienced an immediate improvement of numbness and neuritic pain. On Day 2 and Day 3, there was further reduction in numbness and pain. Decreased swelling in her fingers and hotness were also noted. Finger adduction power improved to 2/5. At 5 months after the surgery, only a minimal sensory symptom was reported and finger adduction power recovered to 4/5. The patient was able to return to modified duty. At 1 year after the operation, finger adduction power and power of FCU, flexor digitorum profundus of ring and little

finger were 4+/5 and 5–/5, respectively. The patient was able to return to full duty.

## Discussion

Anconeus epitrochlearis is an anomalous muscle arising from the medial border of olecranon and adjacent triceps, and inserts into the medial epicondyle. Its prevalence ranges from 4% to 34% in cadaveric studies.<sup>4,5</sup> Osborne's ligament is considered to be the remnant of anconeus epitrochlearis muscle and functions to hold the ulnar nerve in position.<sup>6</sup> The anconeus epitrochlearis muscle could become easily hypertrophied among overhead athletes, causing medial elbow pain and CuTS.<sup>7</sup> In the literature, anconeus epitrochlearis accounts for 5–16% of operated cases of CuTS.<sup>8,9</sup>

Ultrasonography and magnetic resonance imaging are the preferred methods to identify anconeus epitrochlearis. The presence of anconeus epitrochlearis muscle with oedema and hypertrophy, and ulnar nerve swelling proximal to the muscle are the radiological signs of CuTS secondary to anconeus epitrochlearis.

Conservative treatments for CuTS secondary to anconeus epitrochlearis are similar to those for CuTS due to other causes, which include lifestyle modification, resting, nighttime splintage, and steroid injection. Operative treatments vary from excision of the muscle mass alone to excision together with anterior ulnar nerve transposition. Vanderpool et al<sup>9</sup> and Dahner and Woods<sup>6</sup> advocated excision of the muscle alone, whereas Chalmers<sup>8</sup> suggested anterior transposition of the ulnar nerve.

The anconeus epitrochlearis muscle usually causes elbow pain and CuTS in young males especially after weightlifting training. This is attributed to the progressive muscle hypertrophy. Nevertheless, our patient was a middle-aged female with a slight frame and build without recent weightlifting training, which is not typical of CuTS secondary to anconeus epitrochlearis muscle.

Most of the patients suffering from CuTS progress slowly, in terms of weeks and months. However, the case presented in this

report progressed from onset of symptoms to full-bloom sensory, motor, and sympathetic symptoms in just 1 week. Although there are case reports of acute CuTS, the causes mentioned were only gout,<sup>1</sup> pseudogout,<sup>2</sup> and hemangioma.<sup>3</sup> In fact, muscle oedema may occur after hyperactivity or recent trauma, which in turn causes acute nerve compression. Our patient had neither overuse nor trauma of her left elbow, although minor muscle strain could not be completely ruled out.

Ulnar nerve is known to contain sympathetic nerve fibres, and ulnar nerve block can result in an increase in local capillary blood flow.<sup>9</sup> Patients with CuTS commonly present with sensory and motor symptoms but not sympathetic symptoms. The reason is that sympathetic nerve fibres are more resistant to external compression when compared with sensory and motor nerve fibres.<sup>10</sup> We postulate that the ulnar nerve compression was so severe in our case and the progression was so rapid that the resistant sympathetic nerve fibres could not withstand the pressure, and the patient developed acute symptoms such as hotness and swelling in ulnar nerve distribution.

In conclusion, anconeus epitrochlearis muscle is an uncommon cause of CuTS. It can present acutely with sensory, motor, and even sympathetic symptoms. Surgical treatment in such cases is controversial. It can be excision of muscle alone or together with ulnar nerve anterior transposition.

## Conflicts of interest

The author has no conflicts of interest relevant to this article.

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