Ulnar Neuropathy as a Result of Anconeus Epitrochlearis

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Abstract

After carpal tunnel syndrome, cubital tunnel syndrome is the second most common compression neuropathy in the upper extremity. Various sites of ulnar nerve compression at the elbow exist, with the most common being between the 2 heads of the flexor carpi ulnaris. Other potential sites include the arcade of Struthers, the space between Osborne’s ligament and the medial ulnar collateral ligament, the medial epicondyle, the medial head of the triceps, and the medial intermuscular septum. The anconeus epitrochlearis, an anomalous muscle that runs between the medial aspect of the olecranon and the medial epicondyle, is found in up to 28% of cadavers. Although it is far less common, it must be considered when evaluating a patient with cubital tunnel syndrome. The authors report a 19-year-old man with a 2-month history of atraumatic left elbow pain accompanied by distal motor and sensory symptoms that significantly affected his activities of daily living and quality of life. After a short course of conservative management, surgical excision of the anomalous muscle, along with decompression of the ulnar nerve, was performed because of progression of symptoms. The patient had immediate improvement in subjective symptoms and strength on removal of the anconeus epitrochlearis. As shown in this case report, recovery of both motor and sensory nerve function can be achieved if the source of compression is an anomalous muscle and is treated with early surgical removal.

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The anconeus epitrochlearis is a muscle anomaly that has been reported to cause ulnar neuropathy at the elbow. Cadaveric studies showed that the anconeus epitrochlearis is not uncommon in human elbows and reported its presence in 3% to 28% of cadaveric elbows.\(^1\)\(^3\) However, the clinical diagnosis of ulnar neuropathy secondary to this anomalous muscle is rare and its prevalence is not known. Several case reports have described successful surgical management.\(^3\)\(^7\) The authors report a case of cubital tunnel syndrome in a 19-year-old man secondary to compression by the anconeus epitrochlearis. The patient was successfully managed with excision of the muscle and in situ decompression of the ulnar nerve.

**CASE REPORT**

A 19-year-old right-hand-dominant man presented with a 2-month history of left elbow ulnar side pain with atraumatic onset and progressive numbness, tingling, and weakness of the left hand. He did not recall any specific events and did not recall having such symptoms in the past. Numbness and tingling were localized to the hand intrinsic muscles and severe focal slowing of conduction velocity at the ulnar side digits. The medical, surgical, allergy, social, and medication history were unremarkable. The patient was otherwise healthy and planned to begin college in the month of presentation. On physical examination, he had tenderness over the left cubital tunnel and a positive Tinel’s sign. He also had positive Wartenberg’s and Froment’s signs. His hand showed atrophy of the first dorsal interosseous. He fully returned to his normal activities. Physiologic examination showed normal strength to preserve the epineurium and its small vessels surrounding the ulnar nerve by not mobilizing the nerve from its groove. The elbow was then fully flexed and extended, and there was no subluxation of the nerve. The incision was closed with running subcuticular stitches, and a simple soft dressing was applied. An arm sling was placed for comfort.

In the recovery room, the patient reported immediate improvement of numbness and tingling. At 2 weeks after surgery, he showed nearly full range of motion without ulnar nerve subluxation. The contralateral arm was asymptomatic.

Electromyogram and nerve conduction studies showed reduced motor unit recruitment and positive sharp waves in the hand intrinsic muscles and severe focal slowing of conduction velocity at the elbow. Plain radiographs were unremarkable, and magnetic resonance imaging (MRI) showed no edema at the medial aspect of the elbow.

Given the rapid progression of symptoms and signs of ulnar neuropathy, surgical decompression of the ulnar nerve was chosen after a short course of conservative treatment with progression in symptoms. Surgery was performed under general anesthesia. After inflation of a tourniquet applied to the proximal arm, a curvilinear skin incision was made posterior to the medial epicondyle. Dissection of soft tissue down to the fascia was performed, and the medial antebrachial cutaneous nerve was identified and protected. The patient had an anconeus epitrochlearis muscle (Figure 1). This muscle was dissected off the medial epicondyle, and the ulnar nerve was found underneath this muscle, posterior to the medial epicondyle. The anconeus epitrochlearis muscle was the major structure compressing the ulnar nerve as the nerve passed between the medial epicondyle and olecranon (Figure 2). The nerve was flattened and appeared gray in this area compared with its shape and color proximally and distally (Figure 3). The nerve was followed proximally and found to be without constrictive points up to the arcade of Struthers. The motor branches to the flexor carpi ulnaris were identified, and the nerve was unroofed distally as far as possible. Care was taken only after a short course of conservative treatment with progression in symptoms. Surgery was performed under general anesthesia. After inflation of a tourniquet applied to the proximal arm, a curvilinear skin incision was made posterior to the medial epicondyle. Dissection of soft tissue down to the fascia was performed, and the medial antebrachial cutaneous nerve was identified and protected. The patient had an anconeus epitrochlearis muscle (Figure 1). This muscle was dissected off the medial epicondyle, and the ulnar nerve was found underneath this muscle, posterior to the medial epicondyle. The anconeus epitrochlearis muscle was the major structure compressing the ulnar nerve as the nerve passed between the medial epicondyle and olecranon (Figure 2). The nerve was flattened and appeared gray in this area compared with its shape and color proximally and distally (Figure 3). The nerve was followed proximally and found to be without constrictive points up to the arcade of Struthers. The motor branches to the flexor carpi ulnaris were identified, and the nerve was unroofed distally as far as possible. Care was taken...
of the ulnar-innervated muscles. Tinel’s, Wartenberg’s, and Fronen’s signs were negative. At 2-year follow-up, he had complete resolution of first dorsal interosseous atrophy, with normal findings on neurologic examination and elimination of all sensory-related symptoms.

**Discussion**

Compressive ulnar nerve neuropathy is the second most common compressive neuropathy in the upper extremity, but only a very small percentage of these conditions are caused by anomalous muscle structures, such as the anconeus epitrochlearis. Ulnar neuropathy as a result of an anconeus epitrochlearis is rarely reported in young patients without congenital elbow anomalies. To the authors’ knowledge, there have been only 2 other case reports of cubital tunnel symptoms caused by an anconeus epitrochlearis in adolescents. The anatomy of the anconeus epitrochlearis has been discussed extensively, using variable terminology, including epitrochleo-anconeus, subanconeus, or accessory anconeus. Most studies agree that the muscle replaces Osborne’s ligament when present. It follows the same course from the medial olecranon to the medial epicondyle and is often present with a hypertrophied medial triceps muscle, although this was not the case in the current patient.

Complete excision of the muscle is widely accepted as definitive treatment, but whether to transpose the ulnar nerve remains controversial. Excellent results have been obtained with both techniques. In 1979, Chalmers reported that it was wiser to perform full exploration, decompression, and anterior transposition of the ulnar nerve because more common sources of compression may coexist. However, in a case report, O’Hara and Stone noted that if isolated compression can be treated effectively by decompression alone at the site of the anomalous muscle, there is no need for wider decompression or transposition of the nerve. In their patient, the authors completely excised the muscle to prevent regrowth and compression potential. They did not transpose the nerve because the anomalous muscle was obviously the singular source of compression. When the anomalous muscle was removed, the nerve showed no sign of subluxation.

Byun et al discussed the electromyographic findings in patients with ulnar neuropathy from anconeus epitrochlearis muscles compared with those with idiopathic cubital tunnel syndrome. They suggested that there should be a high suspicion of an accessory muscle as the cause of the compression rather than a more traditional cause when a relatively young patient presents with rapid onset of symptoms. They also indicated that if motor conduction studies done over short segments show a loss of greater than 50% of the negative peak area, indicating low compound motor action potential amplitudes, the condition is more likely to be subacute onset of symptoms rather than a more chronic demyelinating process found in more typical compression sites of the ulnar nerve. Furthermore, authors have shown that edema in the muscle belly of the anconeus epitrochlearis visualized on MRI is often associated with ulnar nerve compression and neuritis. However, the lack of specific findings on MRI should not outweigh the findings on clinical examination and should not delay surgical decompression.

**Conclusion**

In this case report, the authors presented the case of an otherwise healthy young patient with a 2-month history of atraumatic left elbow pain accompanied by distal motor and sensory symptoms that significantly affected activities of daily living and quality of life. After a short course of conservative management, surgical excision of the anomalous muscle, along with decompression of the ulnar nerve, was performed because of progression of symptoms. The patient had immediate improvement in subjective symptoms and strength on removal of the anconeus epitrochlearis. As shown in this case report, recovery of both motor and sensory nerve function can be achieved if the source of compression is an anomalous muscle and is addressed by early surgical removal.

**References**