Annals of Clinical Case Reports

Case Report
Published: 24 Nov, 2017

Bilateral Anconeus Epitrochliaris Causing Cubital Tunnel Syndrome: A Case Report

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Abstract

A case report describing the very rare finding of bilateral Anconeus Epitrochliaris. The patient presented with bilateral ulnar nerve symptoms and intraoperative findings identified bilateral Anconeus Epitrochliaris as the cause to the ulnar nerve compression. Ulnar nerve compression can occur at various sites within the cubital tunnel, with the most common sites being the 2 heads of the Flexor Carpi Ulnaris muscle, arcade of struthers and between Osborne's Ligament and the MCL. Entrapment by the Anconeus Epitrochliaris muscle is a rare finding and is present in approximately 3%-34% of individuals. Furthermore, those found to have this muscle have a 25% chance of having bilateral muscles thus ulnar nerve entrapment is likely in the opposite arm. Careful history and examination is key in diagnosing and treating ulnar nerve entrapment regardless of the cause.

Keywords: Anconeus epitrochliaris; Ulnar nerve; Cubital tunnel syndrome

Introduction

The finding of the muscle Anconeus Epitrochliaris is rare, but when present can cause Cubital Tunnel Syndrome. However, finding bilateral Anconeus Epitrochliaris is even rarer. The literature on this rare cause of Cubital Tunnel Syndrome is sparse. To our knowledge this is the second report of bilateral Anconeus Epitrochliaris.

This article will present the case report of the patient along with a concise discussion on ulnar nerve anatomy, distribution and cubital tunnel syndrome.

Case Presentation

A 49-year-old female, right hand dominant and a business woman presented to an upper limb clinic, complaining of bilateral hand problems. She gave a one year history of persistent bilateral little and ring finger numbness, present initially at night time and prolonged elbow flexion positions. Over the last few month prior to presentation her symptoms were reproduced on minimal elbow flexion positions and increasing pain in the elbow, thus troubled by her symptoms throughout the day and every day. She denied any weakness in her hands and no neck pain or trauma.

The patient had no past medical history of note and was not taking any regular medications. On examination, inspection of the elbow joints and entire upper limbs were unremarkable. There was reduced sensation to both sides of the little fingers and only the ulnar half of the ring fingers bilaterally. There was no muscle wasting in the hands and power of (MRC grading) 5/5 in the 1st dorsal interrossi and Abductor Digiti Minimi muscle bilaterally. There was a positive elbow flexion test bilaterally, reproducing symptoms within 30 seconds. Furthermore, Tinel's test over the Cubital tunnel was strongly positive. A full examination of the radial and median nerve was completely normal as was neck examination. A clinical diagnosis of bilateral Cubital Tunnel Syndrome was made, and since the examination and history were strongly positive, nerve conduction studies were not deemed necessary and plain radiographs were unremarkable.

The patient underwent Cubital Tunnel Decompression on the left side under a general anaesthetic, with full resolution of symptoms. Subsequent decompression on the right side was done 6 month later, again with full resolution of symptoms. The cause of this patient's symptoms was identified intra-operatively, with identification of the Anconeus Epitrochliaris muscle bilaterally, which was clearly causing compression of the nerve macroscopically (Figure 1 a-d) A) right elbow with initial dissection demonstrating a structure resembling muscle. B) Anconeus Epitrochliaris elevated to expose the right ulnar nerve beneath. C) Left elbow demonstrating a muscle overlying

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Received Date: *15 Aug 2017*
Accepted Date: *15 Oct 2017*
Published Date: *24 Nov 2017*

Citation:
Rohman L, Michla Y, Holden S, Walsh R. Bilateral Anconeus Epitrochliaris Causing Cubital Tunnel Syndrome: A Case Report. Ann Clin Case Rep. 2017; 2: 1475.

ISSN: 2474-1655

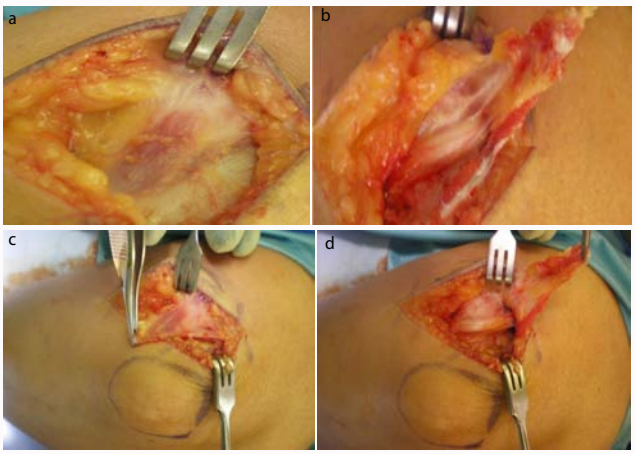

Figure 1: A) Right elbow with initial dissection demonstrating a structure resembling muscle. B) Anconeus Epitrochliaris elevated to expose the right ulnar nerve beneath. C) Left elbow demonstrating a muscle overlying the cubital tunnel. D) Anconeus Epitrochliaris elevated to expose left ulnar nerve beneath).

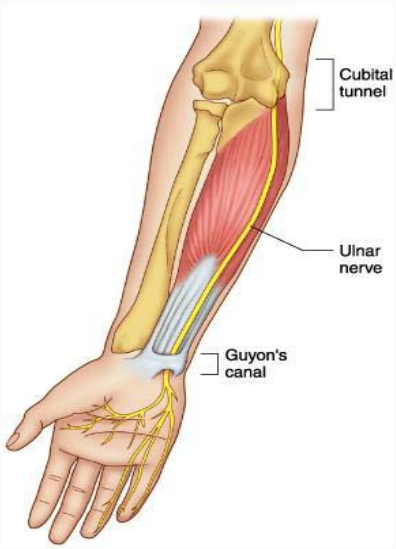

Figure 2: Common sites of ulnar nerve compression [21].

the cubital tunnel. D) Anconeus Epitrochliaris elevated to expose left ulnar nerve beneath).

Discussion

Cubital tunnel syndrome occurs when the ulnar nerve, which is formed by nerve roots C8 to T1, becomes crushed or irritated within the cubital tunnel [1-2] and along other points during the course of the nerve to the terminal digital branches (Figure 2 and 3). In the most common anatomic pattern, the ulnar nerve passes through the medial intermuscular septum (MIS) at approximately the midpoint of the arm, as it approaches the elbow, before entering the posterior aspect of the arm. Travelling behind MIS, on the medial aspect of the triceps, the ulnar nerve then enters the post condylar groove lateral to the medial epicondyle. At the elbow, the ulnar nerve passes through the cubital tunnel, between the medial epicondyle and the olecranon. The roof of the cubital tunnel is formed by a thickening aponeurosis, which becomes the cubital tunnel retinaculum, called Osborne's band (or ligament of Osborne) [3]. Extending from the medial epicondyle to the tip of the olecranon, and approximately 4mm-

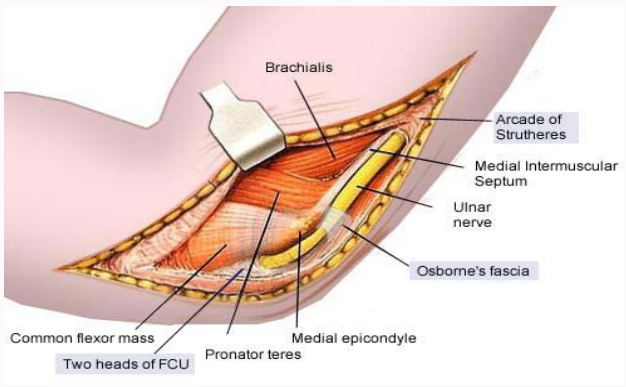

Figure 3: Sites of ulnar nerve compression within the Cubital tunnel [29].

2cm wide from proximal to distal end, Osborne's band connects the tendinous insertions on the humeral and ulnar heads of the Flexor Carpi Ulnaris muscle (FCU). The distal margin merges with the fascia covering the humeral and ulnar heads of the FCU. The fibres of the cubital tunnel retinaculum are arranged transversely, and are pulled taught during flexion of the elbow. It is functionally discrete from the FCU aponeurosis [4,5] Osborne's band is also reported as the thickened border of the flexor carpi ulnaris aponeurosis [6]. An extra structure, the Epitrochleoanconeus ligament, has also been reported, covering the ulnar nerve at this level [7].The floor of the cubital tunnel is formed of the medial collateral elbow ligaments and the joint capsule, with the medial epicondyle and the olecranon forming the walls. The ulnar nerve branches to the elbow whilst within the tunnel. After exiting, the ulnar nerve travels into the forearm between the humeral and ulnar heads of the FCU and then branches to the FCU. When ulnar nerve entrapment occurs, the most common sites are at the Arcade of Struthers, the flexor carpi ulnaris aponeurosis, the medial intramuscular septum and finally the deep flexor pronator aponeurosis [5].

However, there frequently exist other anatomic patterns, already described by Cutts et al. [8]. The third most common of these relates to the presence of the anconeus epitrochlearis muscle. Anconeus epitrochlearis is an extra muscle that has a prevalence of between 3% and 34%, according to cadaveric studies [8-12]. Located proximally to the origin of the two heads of the flexor carpi ulnaris, it arises from the medial border of the olecranon, and inserts into the medial epicondyle. It follows the same route as the retinaculum and in the absence of Osborne's band lies across the roof of the cubital tunnel. Cubital tunnel syndrome is a well-recognised ulnar neuropathy resulting from compression of the ulnar nerve at the elbow [13]. It is the second most common entrapment neuropathy in the arm, with an incidence rate of 24.7 per 100,000 [14,15]. More often than not, the cause is unknown, so it is usually idiopathic. There are however, several space occupying lesions, as well as the anomalous anconeus epitrochlearis muscle that have been reported to cause ulnar nerve compression at the cubital tunnel [16,17,18]. Ulnar neuropathy secondary to the anconeus epitrochlearis muscle presents differently to idiopathic cubital tunnel syndrome, for example presenting at a younger age and progressing more rapidly. The associated symptoms have also been seen to have a shorter duration [19]. Increased elbow pain that is more notable than the sensory symptoms is also found [16,18,20]. We also found this to be the case. It is thought that 25% of the people with this muscle and who are symptomatic will have bilateral anconeus epitrochliaris [17]. Despite the presence of this anomalous muscle

being reported to be present in 3% to 34% of cadaveric specimens [8-12] the clinical diagnosis of secondary ulnar neuropathy is rare. Reports of the anconeus epitrochlearis causing compression [17,19-23] do not actual manage to show how common the condition is, and the prevalence of ulnar nerve compression secondary to anconeus epitrochlearis is unknown [17]. As such it is more often than not an operative finding, not a preoperative diagnosis [16,17,23]. It is worth noting, also, that occasionally the anconeus epitrochlearis muscle is incomplete, with its structure being both muscular and fibrous. As such, it is suggested that the Epitrochleoanconeus ligament described may in fact be an anconeus epitrochlearis muscle, with a highly fibrous structure [24]. The fact that the prevalence of ulnar neuropathy caused by the anconeus epitrochliaris muscle is uncertain [17,19,23] makes it difficult to evaluate how frequently any bilateral neuropathy may occur bilaterally. At the time of writing, the authors had only found one other case report of a similar bilateral ulnar neuropathy caused by the anconeus epitrochlearis muscle [26]. We found that surgical excision of the muscle provided symptomatic relief and a positive outcome for the patient, and this is consistent with other's findings [25,26].

Due to the strength of the diagnosis based on the patient's history and examination, nerve conduction studies were not performed in order to confirm the diagnosis. In other cases, nerve conduction studies can be used to examine the location of the nerve entrapment, as well as the severity and precise location [27]. Kern also showed that nerve conduction studies will most reliably demonstrate slowed ulnar nerve conduction at the elbow, with conduction speeds less than 45.0 metres/second suggested as appropriately slowed conduction [23]. It is worth noting, however, that electrodiagnosis of ulnar nerve entrapment can give false readings and as in our case are not always necessary in the presence of a compelling history and examination. It is also worth considering, that it can sometimes be the case that nerve conduction studies can sometimes be subject to the skill of the healthcare professional performing the test, and it is suggested that rather than relying only on the results of the test, the patient's experiences and symptoms should also be considered [28-29].

Further, we suggest, owing to the prevalence of the Anconeus Epitrochliaris muscle in cadaveric specimens [8-12] there may be benefits to informing any patient who presents with unilateral neuropathy found as a result of Anconeus Epitrochlearis of the potential presentation of the same symptoms in the other arm at a later date. This may in turn help with the prevention of further complications and reduce the need for future surgery for symptomatic relief.

Conclusion

In summary, the causes of Cubital Tunnel Syndrome can be wide ranging but most commonly occur due to a few common causes. Despite the cause of the syndrome prompt clinical history and examination is paramount in the diagnosis and surgical treatment is usually necessary. Having an awareness of more unusual causes can aid the clinician to be vigilant in the management of the patient and also aid surgical dissection and exploration. When the anomalous muscle Anconeus Epitrochliaris is present one should suspect the possibility of bilateral presence and counsel/investigate the patient appropriately.

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