

Case Report

Ulnar Tunnel Syndrome Due to an Aberrant Muscle

Ahmadreza Afshar MD¹**Abstract**

This report presents a case of dynamic ulnar tunnel syndrome due to an additional origin of abductor digiti minimi muscle (ADMM) from the palmaris longus tendon. Patient's symptoms resolved after excision of the aberrant muscle.

Keywords: Abductor digiti minimi muscle, aberrant muscle, compression neuropathy, ulnar tunnel syndrome

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Introduction

The abductor digiti minimi muscle (ADMM) normally originates from the pisiform bone, flexor carpi ulnaris, and pisohamate ligament. The tendon of this muscle divides into two slips that are attached to the ulnar side of the proximal phalanx base of the little finger and the ulnar border of the dorsal digital expansion of the extensor digiti minimi muscle.¹ However, ADMM is the most variable hypothenar muscle, and researchers have speculated its relation with the compression of the ulnar nerve in the Guyon's canal. This report presents a case of ulnar tunnel syndrome caused by an additional origin of ADMM.¹⁻⁵

Case Report

A 22-year-old male student presented with a mild swelling on the volar and the ulnar border of his right wrist. Its volume was increased during a forced fisting of his hand. He experienced wrist pain and paresthesia in his right ring and little fingers during exercise. However, he did not complain of weakness in his hand. His symptoms were present from adolescent, but there has been relief by avoiding efforts.

On physical examination, Spurling's and Adson's signs were absent, and Phalen's test as well as Tinel's sign and Durkan's tests on the median nerve were negative. In addition, Tinel's sign on the ulnar nerve was negative at the Guyon's canal and elbow level. Two-point discrimination was normal in the fingers. There was no intrinsic muscle wasting. The nerve conduction study and electromyography were normal. An ultrasound examination ruled out ulnar artery aneurysm and ganglia. However, on axial sonogram a hypoechoic oval mass with distinctive internal muscle structure adjacent to the ulnar nerve was detected in the Guyon's canal. This finding suggested a probable dynamic ulnar nerve compression (Figure 1).

Following an exploration under the regional block, an aberrant muscle was found, originating from the palmaris longus tendon, which crossed over the ulnar nerve and artery as well as passed through the Guyon's canal; it was then followed by ADMM (Figure 2). The ulnar

nerve appeared normal. This finding suggested a probable dynamic ulnar nerve compression during strenuous activities. Pulling of the muscle was followed by flexion of the proximal phalanx of the little finger. Following a discussion with the patient, he refused further distal exploration to find the distal insertion of the aberrant muscle. Thus, the aberrant muscle was partially excised, and the patient's symptoms were resolved following surgery.

Discussion

Accessory ADMM within the Guyon's canal are common in the normal population. Harvie, et al. examined the Guyon's canal on the wrists of 116 patients using ultrasound and found ADMM anomalies in 41 (35%) of the wrists.⁴ Dodds, et al. have found 13 (22%) anomalous muscles in the Guyon's canal of 58 wrists during cadaveric studies. All 13 abnormal muscles followed ADMM and inserted on the ulnar side, the proximal phalanx base of the small finger.⁵ Zeiss, et al. observed anomalous muscles in the Guyon's canal in 9 Patients (25%), following magnetic resonance imaging of 36 wrists.⁶ All of the abnormal muscles were inserted with ADMM. Abductor digiti minimi muscle anomalies have been bilaterally observed in 50% of the study subjects.⁴⁻⁶

ADMM may have one to three muscle bellies, and may have extra origins from the flexor carpi radialis tendon, the flexor carpi ulnaris, the palmaris longus tendon as in the current case, the flexor retinaculum, the pronator quadrates tendon, hamate, trapezium, the forearm bones, and the deep anterbrachial fascia of the medial aspect of the forearm.¹⁻³ These variations are clinically important because they may compress the ulnar nerve at the wrist level.¹⁻⁶

In the current case, pulling the muscle was followed by flexion of the proximal phalanx of the little finger, but not abduction of the little finger. This finding may indicate that the abnormal ADMM had only one insertion to the proximal phalanx of the little finger.²

In the current case the patient's symptoms were probably related to the decreased space in the Guyon's canal because of the presence of a sizeable aberrant muscle and its dynamic compression of the ulnar nerve during forceful exercise.

Because the anatomy of the origins of the abductor digiti minimi muscle may be highly variable, the knowledge of these anatomic variation increases safety in surgeries performed for harvesting the palmaris longus tendon, extended carpal tunnel surgery, decompression of the Guyon's canal, and Huber opponenseplasty as well as repairs of the nerves and tendon cuts at the wrist level.³

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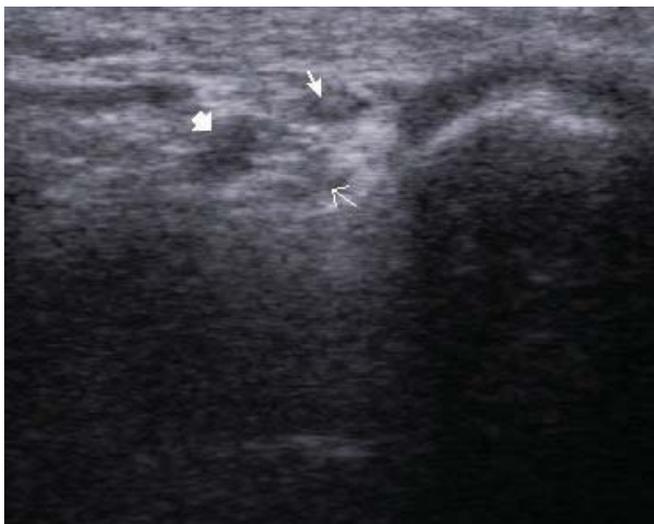


Figure 1. Axial carpal ultrasonogram at the level of guyon tunnel shows ulnar artery (arrow-head), ulnar nerve (thin arrow) and hypoechoic mass in the tunnel (thick arrow).

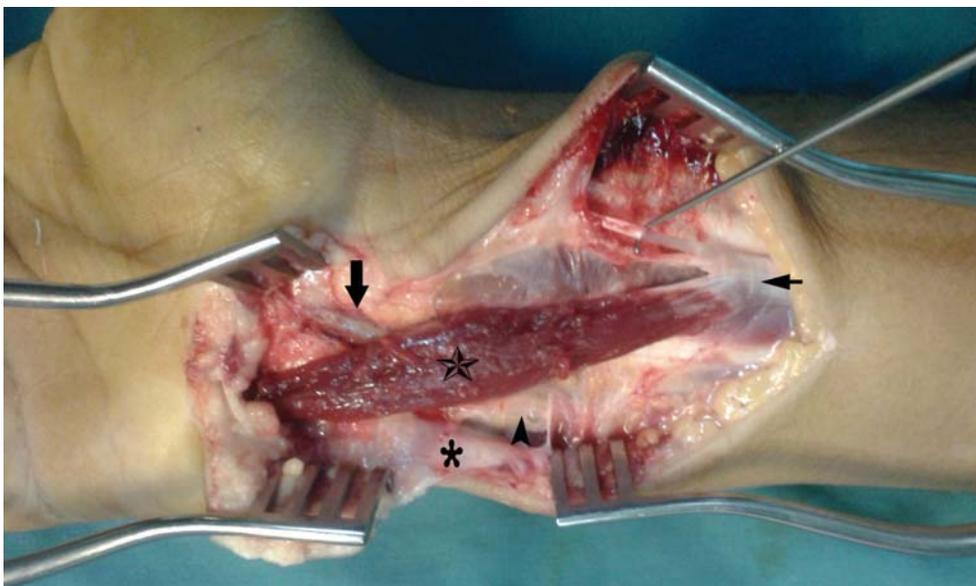


Figure 2. Star indicates the aberrant muscle. Palmaris longus tendon is retracted by a hook. Small arrow indicates the proximal attachment of the aberrant muscle with the palmaris longus tendon. Large arrow indicates the ulnar artery. The arrow head indicates the ulnar nerve. Asterisk indicates the flexor carpi ulnaris tendon.

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