

## CASE REPORT

# Unusual coexistence of a variant abductor digiti minimi and reversed palmaris longus and their possible relation to median and ulnar nerves entrapment at the wrist

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### Abstract

During routine anatomical dissection of the left upper limb of a 73-year-old female cadaver, a unique coexistence of variant muscles was found. In the forearm region, a largely developed reversed palmaris longus was discovered. Its short distal tendon was in close relation to the median nerve. In the neighboring hypothenar region, an unusual abductor digiti minimi was also observed. Its muscular body was composed of two portions – medial and lateral one, arising from the reversed palmaris longus tendon. The lateral portion passed over the ulnar nerve and artery in the canal of Guyon. In the literature, there are descriptions of entrapment neuropathies caused by either reversed palmaris longus or variant abductor digiti minimi. Here, for the first time we describe a coexistence of these variant muscles and suggest it as a possible, even rare, cause of both the median and ulnar nerves entrapment and ulnar artery thrombosis.

**Keywords:** entrapment, median nerve, reversed palmaris longus, ulnar nerve, variant abductor digiti minimi.

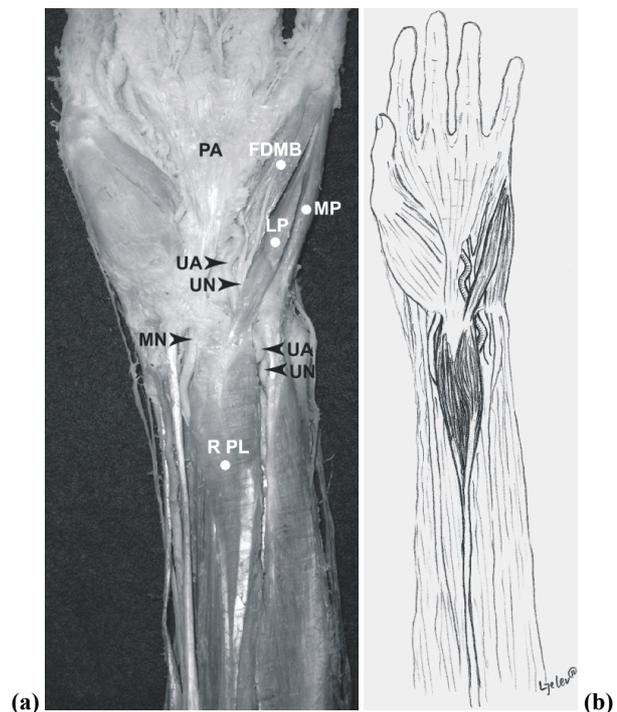
### Introduction

Compression neuropathies at the wrist are frequent and have been well described [1–11]. They can be provoked by ganglia, neoplastic masses, vascular abnormalities, ligamentous attachments, and also different anomalous muscles [11, 12]. Common variations related to median or ulnar nerves compression are the aberrant abductor digiti minimi (ADM) [3, 4, 6], and the reversed palmaris longus (PL) [2, 5, 7, 13] muscles.

Here, we present an unusual cadaver case of coexistence of variant ADM and reversed PL and emphasize on their potential clinical importance.

### Material, Methods and Results

During routine anatomical dissection, approved by the Medico-Legal Office and Local Ethic Committee, of the left upper extremity of a 73-year-old formol-carbol fixed Caucasian female cadaver, from the autopsy material available at the Department of Anatomy, Histology and Embryology of the Medical University of Sofia, an unusual coexistence of muscular variations were observed (Figure 1). In the anterior forearm region, a largely developed reversed PL was found. This muscle was composed of a long proximal tendon (length 136 mm, width 5 mm) originating from the medial epicondyle of the humerus, which tendon distally passed into a fusiform muscular body (length 89 mm, width 26 mm) ending with a short distal tendon into the palmar aponeurosis. The lateral edge of this tendon was in close relation to the median nerve entering the carpal tunnel. Surprisingly, in the adjacent hypothenar region a clearly visible variant ADM was discovered.



**Figure 1 – Photograph (a) and scheme (b) of the variant findings. Muscles and aponeurosis: LP – lateral portion of the variant abductor digiti minimi; MP – medial portion of the variant abductor digiti minimi; FDMB – flexor digiti minimi brevis; R PL – reversed palmaris longus; PA – palmar aponeurosis. Nerves: MN – median nerve; UN – ulnar nerve. Artery: UA – ulnar artery.**

The body of the variant ADM was composed of two well-defined portions, medial and lateral. The medial

portion (length 64 mm, width 8 mm) arose from the pisiform bone and from the tendon of the flexor carpi ulnaris; the longer lateral portion (length 79 mm, maximal width 7 mm) originated from the end tendon of the reversed PL and passed over the ulnar artery and nerve in the canal of Guyon.

The two portions of the variant ADM fused in a common muscular body that attached to the ulnar side of the base of the fifth proximal phalanx.

No variations in the contralateral right upper extremity were discovered.

The information, concerning history of previous diseases for the dissected subject missed.

Apart of the swelling over the flexor surface of the forearm, no other clinical signs of trauma or surgical scars were noticed.

## Discussion

Different authors have described the variations of ADM and PL during cadaver dissections and surgical interventions [2–11, 14–16].

The PL has numerous variations, being one of the most variable muscles in the human body. The most common PL variations are its absence, duplication, digastric muscle, reversed and bifid reversed variation [15, 16]. There were also variations in origin and insertion of the PL [16].

On the other hand, the reported variations of the ADM are absence, presence of second head, variant origin (from the pisiform bone, fascia of the forearm, palmaris longus tendon, fascia of the flexor carpi radialis, intermuscular fascia, flexor carpi ulnaris, flexor retinaculum, both from the flexor retinaculum and antebrachial fascia), fusion with the flexor digiti minimi brevis, presence of “deep abductor-flexor” and also triple origin [14–16].

In clinical practice, variant muscular structures in the anterior wrist region could be incidentally found during surgical procedures without provoking clinical symptoms [17] or may simulate a soft-tissue tumor [17, 18]. However, some musculo-tendinous anomalies, including those belonging to ADM and PL may cause median and ulnar nerves compression with slow progressive symptoms or rarely acute nerve compression and lead to serious complaints in certain professional groups [2–7, 10, 11, 13].

The symptomatology that patients develop includes swelling, reduction of hand’s muscular power, pain and numbness in the area of distribution of the compressed nerves [2, 6, 17, 18].

Jeffery AK [4] stated that when the anomalous muscles produce clinical symptoms, they appear to be related to two factors: the anatomical site of the muscle and the presence of a muscle hypertrophy.

Turner MS and Caird DM [19] considered the fact that provoking factors, such as injury or nature of work could cause hypertrophy of the muscles, or subject the hand to repetitive minor trauma.

In the literature, there are many reports of median nerve entrapment caused by reversed PL [2, 3, 5, 7, 9]. Variations of the AMD, on the other hand, may cause

ulnar nerve entrapment [3, 4, 6], or rarely ulnar artery thrombosis [20, 21].

## Conclusions

Variation of the unique coexistence of the ADM and the reversed PL, described here, may cause even rare entrapment of both the median and ulnar nerves and should be born in mind by clinicians.

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