

The Concomitant Presence of Two Anomalous Muscles in the Forearm

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Abstract This article describes the concomitant presence of two anomalous forearm muscles in a 20-year-old man, discovered accidentally during an operation for a forearm injury. The first one was similar to a reverse palmaris longus muscle except for its direction to the Guyon's canal. The second one originated from the radial antebrachial fascia, superficial to all other forearm muscles in the lower half of the forearm, then diverged medially and extended into the Guyon's canal and was innervated by the ulnar nerve. The patient had no symptoms related to overcrowding of the Guyon's canal before the injury. A hand surgeon should be well informed about the anatomic

variations of the hand to be comfortable during surgical practice.

Keywords Reverse palmaris longus · Ulnar nerve · Anomalous muscle · Forearm

Introduction

The prevalence of muscle anomalies around the wrist related to the palmaris longus muscle and the Guyon's canal is relatively high [1, 2, 4, 6, 12]. The palmaris longus muscle can have variations in the form of duplication, accessory slips, and substitute structures, or it could even be completely missing. Also, its origin or insertion can have frequent variations. These anatomical variations have clinical implications including possible median and ulnar neuropathies [9, 5, 10, 11]. The presence of a muscle belly in the Guyon's canal has also been reported as a contributory factor in ulnar artery thrombosis [8]. The tendon of palmaris longus is often harvested for use as a graft in many surgical procedures such as tendon interpositions and ligament repairs [3, 7]. The hand surgery practice requires familiarity with its variations. We present two concomitant anomalous muscles of forearm origin directed toward the Guyon's canal.

Case Report

A 20-year-old man presented with a zone-5 flexor injury of the right forearm after a blow on a window. During the operation, an anomalous muscle with a broad muscular origin from the radial part of the distal third of the antebrachial

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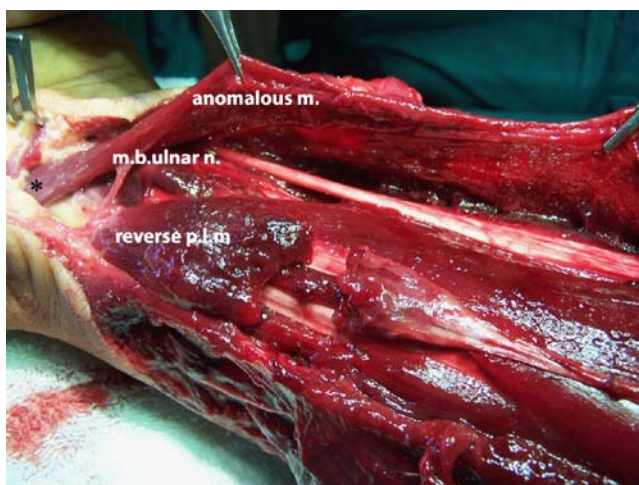


Figure 1 View of motor branch of ulnar nerve (m.b. ulnar n.), anomalous muscle, reverse palmaris longus muscle (p.l.m.) upon exploration. (*asterisk*) anomalous muscle entering Guyon's canal.

fascia was discovered. Its origin was superficial to all other forearm muscles including the flexor carpi radialis (Fig. 1). It then traversed the forearm muscles, directed to the Guyon's canal and acquired a motor branch from the ulnar nerve on its way.

The other anomalous muscle was a reverse type palmaris longus muscle except for its orientation to the Guyon's canal where it blended with the fibers of the flexor carpi ulnaris tendon (Fig. 2).

Discussion

In its most frequent form, the palmaris longus muscle springs from the medial epicondyle by the common tendon, from adjacent intermuscular septa, and antebrachial fascia.

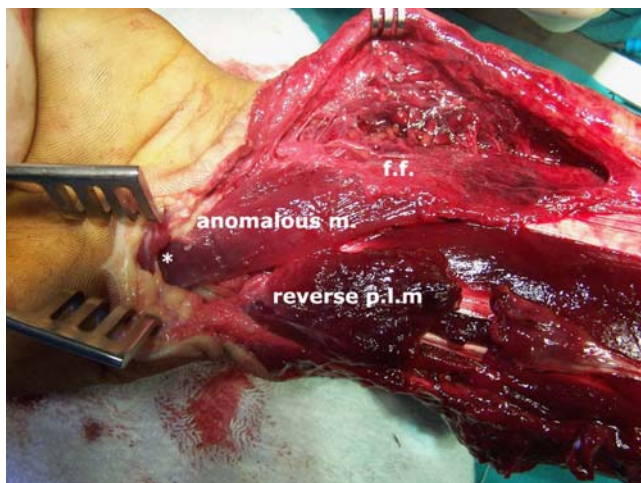


Figure 2 View of anomalous muscle (m) originating from forearm fascia (f.f.) and reverse palmaris longus muscle (p.l.m.) upon exploration. (*asterisk*) anomalous muscle entering Guyon's canal.

Its long slender tendon passes anterior to the flexor retinaculum and is attached to the distal half of its anterior surface and centrally to the palmar aponeurosis [12]. The prevalence of anomalies of the palmaris longus muscle is higher than any other muscle in the forearm. Double and reverse palmaris longus muscles have been reported which can cause median nerve compression [11]. In the present case, there was a palmaris longus muscle of the reverse type. However, the uniqueness of the case came from its origin, which was to the tendon of the flexor carpi ulnaris at the level of the pisiform bone and to the inferior and ulnar part of the volar carpal ligament and its being together with another muscular anomaly.

Dodds et al., reporting a series of 58 cadaver wrist dissections, described a 22% incidence of anomalous muscles at Guyon's canal [1]. Zeiss et al. [13] studied the normal anatomy of Guyon's canal in 36 wrists using magnetic resonance imaging (MRI). There were five anomalous muscles that originated proximal to Guyon's canal from the antebrachial fascia. However, the origin of these muscles was from the radial side of the pisiform bone and the posterior surface of flexor retinaculum. In the present case, the origin was well proximal to the flexor retinaculum and on the radial side of the forearm fascia. Saadeh and Bergman described a similar combination of anomalous muscles with an accessory flexor (opponens) digiti minimi brevis and a reverse palmaris longus [4]. The reverse palmaris longus muscle in their report originated from the posterior aspect of the flexor retinaculum, as opposed to pisiform origin in our case. In addition, the accessory flexor (opponens) digiti minimi muscle that they described originated from the antebrachial fascia at the level of palmar carpal ligament. The anomalous muscle in our case had a more proximal and broader origin. It also passed over and anterior to the flexor carpi radialis tendon, whereas in their case, this tendon was not overlaid by the muscle. Keeping these variations in mind can help clinicians differentiate the structures in complex injuries so that they feel comfortable during surgery. These variations should also be kept in mind that they could help explain various conditions of arterial and nerve dysfunctions which otherwise are thought to be idiopathic.

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