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Case Report Open Access

Right Sided Variant Palmaris Longus Invertus Enclosing Ulnar Nerve and Ulnar Artery – A Case Report

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Abstract

Introduction: The anatomical knowledge regarding variations in muscles, blood vessels and nerves reveal vital aspects worth considering, when treating musculoskeletal diseases.

Case report: The present case reports a male cadaver with a variant palmaris longus muscle in the right forearm. The right palmaris longus muscle originated by a thin long tendon from the medial epicondyle of the humerus and presented as an inverted fusiform muscle belly in the distal half of the forearm. The muscle belly at its distal end was split into two slips enclosing the ulnar artery and the ulnar nerve.

Conclusion: It is important for a physician to be aware of this variation, as the excessive contraction of this palmaris longus invertus muscle may compress the ulnar artery and ulnar nerve with subsequent lack of blood supply to the hand and weakness/atrophy of muscles supplied by the ulnar nerve. The hand surgeon has to be cautious as well, while harvesting the palmaris longus tendon/muscle as a graft and observe its relationship with ulnar artery and ulnar nerve.

Keywords: Palmaris longus; Invertus; Ulnar nerve; Ulnar artery

Introduction

The most common examples of the partial or complete absence of one or more muscles are pectoralis major, palmaris longus, serratus anterior and quadratus femoris [1]. The palmaris longus is one of the most variable muscles in the body. Its absence has been reported as early as 1543 by Vesalius [2,3]. It is phylogenetically a degenerate metacarpo-phalangeal joint flexor [4]. Palmaris longus may be digastric or fleshy throughout its entire length. It may be fleshy distally and tendinous proximally or may be reduced to a tendinous band [5].

While carefully reviewing all the variations mentioned in the literature, the present case is probably the first one to be reported in the literature. The present case describes a unique variation in palmaris longus invertus, where the distal fusiform muscle belly of palmaris longus splits into two slips of insertion to enclose the ulnar artery and the ulnar nerve.

Case Presentation

The observations were made in an 87-year-old-male cadaver during regular educational dissection in the gross anatomy lab of the medical college.

While dissecting the flexor compartment of the forearm, the palmaris longus muscle showed a unique variation only on the right upper extremity, whereas on the left side, it showed normal anatomy. On the right forearm, the palmaris longus muscle had a long thin tendon with its proximal attachment to the medial epicondyle of the humerus.

The tendon was lying in between the flexor carpi radialis and flexor carpi ulnaris muscles, on the anterior surface of flexor digitorum superficialis muscle. The thin long tendon became a fusiform muscular belly in the distal half of the forearm (Figure 1).

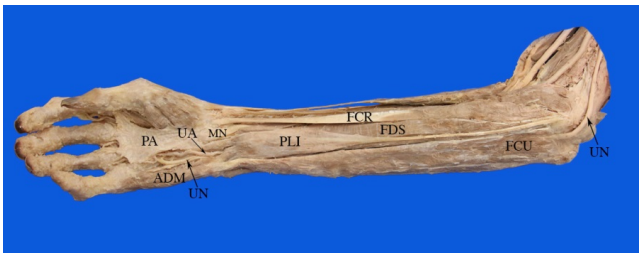

Figure 1: Flexor compartment of the right forearm and palm of hand: showing Palmaris longus invertus (PLI), palmar aponeurosis (PA), flexor carpi radialis (FCR), flexor carpi ulnaris (FCU), ulnar nerve (UN), ulnar artery (UA), median nerve (MN), abductor digiti minimi (ADM).

At the distal end of the forearm, the muscle belly of palmaris longus invertus was split into two slips to enclose the ulnar artery and the ulnar nerve between them (Figures 1 and 2).

The lateral slip of insertion of palmaris longus muscle belly was attached distally to palmar aponeurosis and flexor retinaculum and was related to the median nerve laterally and to the ulnar artery medially. The medial slip of insertion of the palmaris longus muscle belly was fused with the abductor digiti minimi muscle (Figure 2). At the wrist, the ulnar artery and the ulnar nerve were enclosed in

between the two slips of insertion of fusiform muscle belly of palmaris longus invertus (Figures 1 and 2).

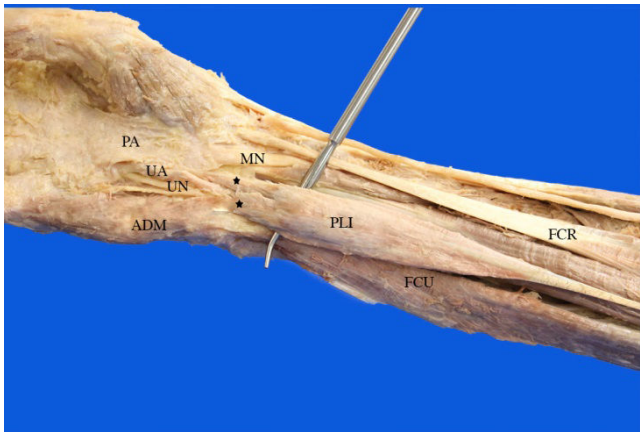

Figure 2: Distal forearm and hand: showing the distal muscle belly of Palmaris longus invertus (PLI), the lateral and medial slips (*) of insertion of palmaris longus invertus enclosing ulnar nerve (UN) and ulnar artery (UA), palmar aponeurosis (PA), flexor carpi radialis (FCR), flexor carpi ulnaris (FCU), median nerve (MN), abductor digiti minimi (ADM).

Discussion and Conclusion

The palmaris longus muscle belongs to the superficial flexor muscles of the forearm taking a common flexor origin from the medial epicondyle of humerus with other superficial flexor muscles of the forearm [4]. The most common variations are its absence, digastric muscle, duplication and reversed muscle [5-9]. The palmaris profundus is a rare anatomical variation, which may lead to compression of median nerve [10]. Effort related compression of median and ulnar nerves has been seen as a result of hypertrophied palmaris longus muscle with extension into the Guyon's canal [11]. The present case showed palmaris longus invertus with a proximal long tendon taking origin from the medial epicondyle of humerus and distal half of fleshy belly. The muscle belly at its distal end was split into two slips to enclose the ulnar artery and the ulnar nerve. This variation should be kept in mind by the surgeon, as the palmaris longus tendon is often considered an ideal graft in replacement of long flexor tendons of the hand in reconstructive surgeries.

While planning to use palmaris longus muscle/tendon for grafting, it is important for the surgeon to get preoperative evaluation by using important imaging modalities like ultrasound and magnetic resonance imaging (MRI) to evaluate variations in the palmaris longus muscle and its relationship to the nerves and vessels, i.e., ulnar nerve, ulnar artery and median nerve before surgery [12,13]. The presence of muscle belly of palmaris longus invertus in the distal part of the forearm may cause difficulties in endoscopic wrist surgery or electromyographic studies of the median and ulnar nerves at the wrist [11,14]. Overuse of the palmaris longus invertus may also give rise to swelling in the distal forearm and hand. It may also produce pressure on the ulnar nerve and ulnar artery, which are enclosed in between the distal slips of insertion of the palmaris longus invertus. The pressure on the ulnar nerve and the ulnar artery may give rise to the ischemia/weakness of the hand muscles and numbness/tingling in the area of distribution of ulnar nerve [10,11].

An 87-year-old male cadaver during educational dissection of the forearm in gross anatomy lab revealed a variant palmaris longus invertus with a proximal long tendon of origin from the medial epicondyle of humerus and an inverted fusiform muscle belly in the distal half of the forearm. The muscle belly of the palmaris longus invertus was split at its distal end into two slips to enclose the ulnar nerve and ulnar artery, which made them vulnerable to compression during contractions of the muscle. Since the palmaris longus is commonly used for grafting of long tendons of hand, this unique variation and its close relationship with ulnar nerve and artery should be kept in mind by the surgeon.

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