

A Rare Anatomical Variation of Palmaris Longus Muscle – A Case Report

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ABSTRACT

The palmaris longus, a slender fusiform muscle of the superficial anterior compartment of forearm, is especially prone to exhibiting anatomical variance relative to other muscles in the upper extremity. The most frequent anatomical variation is the completely absent palmaris longus, followed by the reversed, duplicated, bifid or hypertrophied palmaris longus muscles. The present report describes a case of variation in the insertion of palmaris longus muscle, followed by clinical and surgical relevance.

KEYWORDS: *Palmaris longus, Anatomical variations*

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INTRODUCTION

Palmaris longus (PL) is a slender, fusiform muscle medial to flexor carpi radialis. It arises in common with the superficial flexor muscles from the medial epicondyle of the humerus and forms a long slender tendon [1]. It has short muscle belly and long tendon which passes anterior (superficial) to the flexor retinaculum. A few fibres interweave with the transverse fibres of flexor retinaculum; as the tendon crosses retinaculum, it merges with palmar aponeurosis that occupies triangular area in the mid-palm with the apex pointing proximally and distally inserts to skin and fascia in the distal palm and digital webs [2]. Just proximal to wrist the median nerve projects laterally deep to the PL and lies in between the flexor carpi radialis and PL.

Variations in PL morphology are not uncommon: they may include an additional belly of the muscle, fusion with another muscle, bifurcated tendon, reversed muscle, may be as atypical tendon course and inserts or may be in the form of multiple

tendinous insertion. A knowledge of PL variations is important due to its usage as graft for tendon/ligament reconstruction, especially in reconstructive hand surgery. It is most frequently used as a graft for the finger flexors. The PL muscle tendon is a perfect choice for grafts, because it meets the most important criteria, such as the necessary length and diameter, and the functionality of the upper limb is undisturbed by the harvesting of the PL tendon [3].

CASE REPORT

During routine dissection for undergraduate medical students in the Department of Anatomy, Shri Dharmasthala Manjunatheshwara college of Ayurveda and hospital, Hassan, a unilateral variation of the PL muscle was observed on the right side of seventy-two years old female cadaver.

In the present case, during exposure of superficial flexors of forearm, it was noticed that PL was absent. But after exposure of other superficial muscles, while flexor digitorum superficialis was reflected

downwards by taking section in mid of forearm, the PL was observed originating from common flexor origin from the medial epicondyle of humerus and was seen lying deep to the other superficial flexor muscles. However, the muscle was short, proximal 2/3 was muscular and distal 1/3 was tendinous, with its insertion at the mid of forearm 4cms proximal to

the flexor retinaculum, where it was seen merging with fibres of one of the tendons of flexor digitorum profundus. Ulnar artery was seen passing beneath the tendon of PL from lateral to medial and continuing medial to it. Median nerve was coursing lateral to it (fig 1).

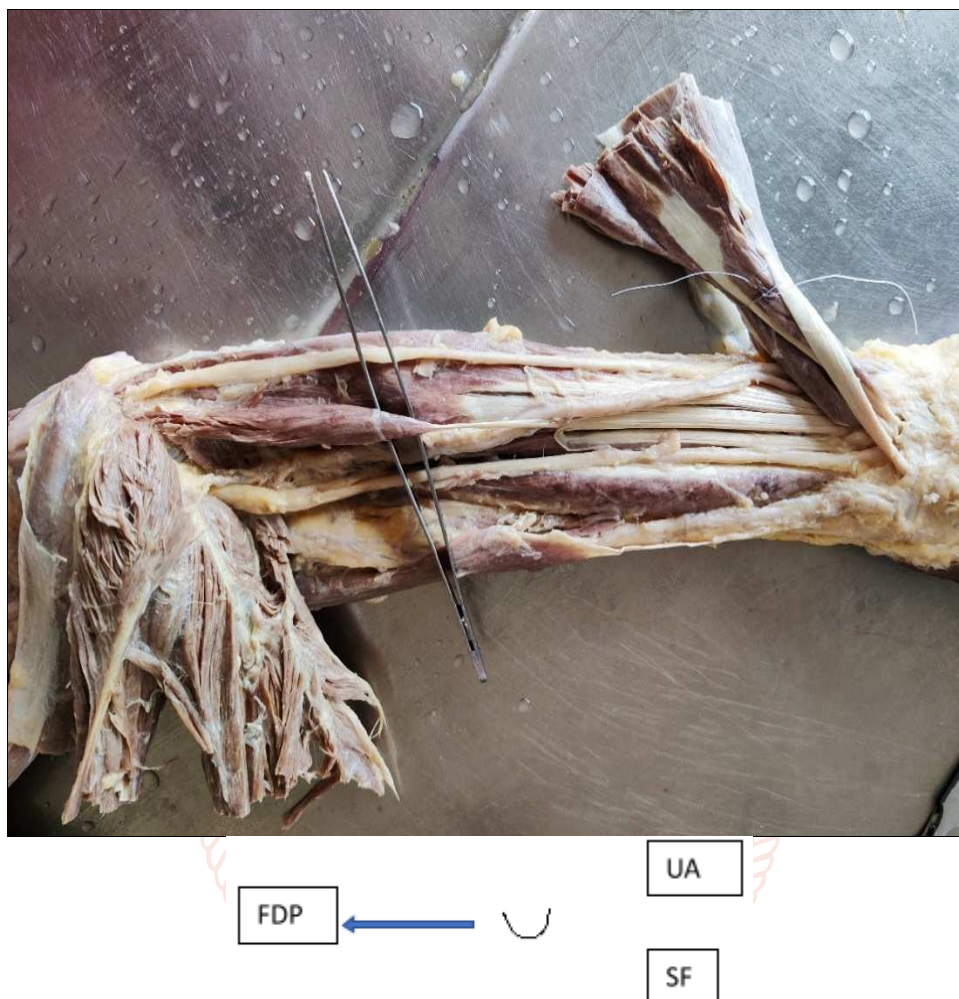


Fig 1: showing origin and Insertion of palmaris longus with its relation Common Origin (CO), palmaris longus (PL), Ulnar artery (UA), Insertion (I), Flexor digitorum profundus (FDP), Superficial flexors (SF), Median nerve (MN)

Discussion:

PL muscle is described as a mere phylogenetically degenerated tendon of metacarpophalangeal flexor because of its clinical insignificance and its numerous anatomical variations (2). However, the common variants can lead to pathological conditions due to the narrow topographical relationship between the PL and the neuro-vascular component, causing neurovascular compression (4).

Agenesis of PL has been described as the most common anatomical variation, observed in approximately 2% to 25% of the population, with a higher prevalence in Caucasians (5).

All other anatomical variants combined account for those found in approximately 9% of the population. These include duplicated or bifid PL (depending on

whether they share a common origin and muscle belly); triple-headed PL muscles; accessory PL; palmaris profundus (distal tendon passes deep to the flexor retinaculum); and reversed PL (6).

In present study, a rare variation of palmaris longus has been noted where the origin was normal from medial epicondyle, lies deep to the other superficial flexor muscles and tendon fuses with flexor digitorum profundus 4cms above the flexor retinaculum.

Understanding the anatomical variations of the PL is important because it often plays a crucial role during reconstructive surgeries, used as a tendon graft and in neurovascular compression syndromes.

Tendon grafting involves the bridging of a gap in a tendon with an autogenous donor tendon from the

same or a separate extremity. Types of tendon grafting are Tendon allograft (refrigerated flexor tendon graft), Artificial tendon graft (nondegraded materials to substitute tendon tissues), Tissue engineering (generating autologous graft using scaffold).

Potential donors should have adequate length and diameter, ease of harvest and lack of donor site morbidity, get well incorporated with bone (7). Preferable donor tendons are Palmaris longus, Plantaris, External digitorum longus, Extensor indicis proprius.

PL tendon is often considered as ideal donor of tendon grafts for replacement of long flexors of thumb and fingers. It is essential to clinically examine reconstructive patients for potential PL anatomical variations to avoid inappropriate surgical procedures and prevent disappointing surgical results.

PL tendon can be assessed with clinical tests whose reliability varies. The '**Bunched Finger**' test- the participants are asked to place their hand flat on the table with the palm facing upwards. They are then asked to bunch their fingers and exert firm pressure at the opposing fingertips. This fixes the distal portion of the PL musculotendinous unit. Next, they are asked to flex the wrist which makes the tendon to stand out prominently. The '**Hooked finger test**' The participants are asked to stretch out their arm and then hook their fingers. The examiner then hooks the fingers of his hand and then locks his fingers into the hooked fingers of the patient. The patients are then asked to flex their wrist while the examiner gives resistance. This makes the PL tendon stand out prominently (8).

Conclusion:

The clear knowledge of variants of palmaris longus is important due to its role in vasculo-neural compression. In addition, surgical procedures performed in this region requires accurate knowledge of the mean distance between the interstyloid line and structures crossing with the palmaris longus.

Importantly, its usage as a graft for tendon/ligament reconstruction; especially in reconstructive hand surgery, and most frequently as a graft for the finger

flexors [3]. It is essential to understand the variants for achieving successful graft surgical procedures.

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