

Reversed palmaris longus muscle: Anatomical variant – case report and literature review

Amera Murabit MD FRCSC, Maria Gnarra MD, Adel Mohamed MD

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The palmaris longus, a slender fusiform muscle, 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 reversed palmaris longus muscle represents a structure that is tendinous proximally and muscular distally (opposite of the normal palmaris longus). The present report describes a case of reversed palmaris longus muscle, followed by a literature review to illustrate the wide spectrum of anatomical variations in the palmaris longus muscle and their clinical and surgical relevance.

Key Words: *Anatomical variations; Palmaris longus*

L'inversion du grand palmaire, une variante anatomique : rapport de cas et analyse bibliographique

Le grand palmaire, un muscle fusiforme mince, est particulièrement enclin aux variations anatomiques par rapport aux autres muscles des membres supérieurs. La variation anatomique la plus fréquente est l'absence de grand palmaire, suivie de son inversion, de son dédoublement, de sa bifidité et de son hypertrophie. L'inversion du grand palmaire est une structure tendineuse sur le plan proximal et musculaire sur le plan distal (à l'opposé du grand palmaire normal). Le présent rapport décrit un cas d'inversion du grand palmaire, suivi d'une analyse bibliographique pour démontrer le large spectre de variations anatomiques du grand palmaire et leur pertinence clinique et chirurgicale.

CASE PRESENTATION

Routine dissection of the left upper extremity of an 82-year-old Caucasian female cadaver, performed in the Department of Anatomy at the University of Saskatchewan (Saskatoon, Saskatchewan), revealed a rare variation in the anatomy of the palmaris longus (PL) muscle.

On dissection and examination, it was discovered that the PL of the left upper extremity of this cadaver was 'reversed' – with the proximal portion being tendinous and the distal portion being muscular.

Examination of the upper extremity showed no signs of atrophy or hypertrophy, nor median or ulnar nerve entrapment in the left upper extremity. The cadaver's medical history, occupation and handedness were unknown. No anatomical variations were noted in the right upper extremity of this cadaver.

In the present case, the PL originated at the common flexor origin from the medial epicondyle. However, the origin was tendinous – a long thin tendon, instead of the normally observed PL muscle fibres.

Two-thirds down the forearm, the PL structure became more muscular in nature, with a muscle belly that spanned the distal one-third of the forearm. At the distal insertion of the PL, at the level of the wrist, the muscle fibres became tendinomembranous and continued into the palmar aponeurosis where they ultimately terminated (Figure 1).

DISCUSSION

The standard anatomical origin of the PL is the common flexor at the medial epicondyle, shared by other superficial flexors such as the flexor digitorum superficialis – located beneath the PL – and the flexor carpi radialis and flexor carpi ulnaris – between which the PL is located. The standard anatomical insertion is the palmar aponeurosis, volar to the flexor retinaculum. Although the palmar aponeurosis joins the PL tendon, the two are distinct entities, as shown by their different origin and development (1). The vascularity is most commonly supplied by branches of the ulnar artery, followed by branches of the brachial artery. Branches of the median nerve supply innervation (2).

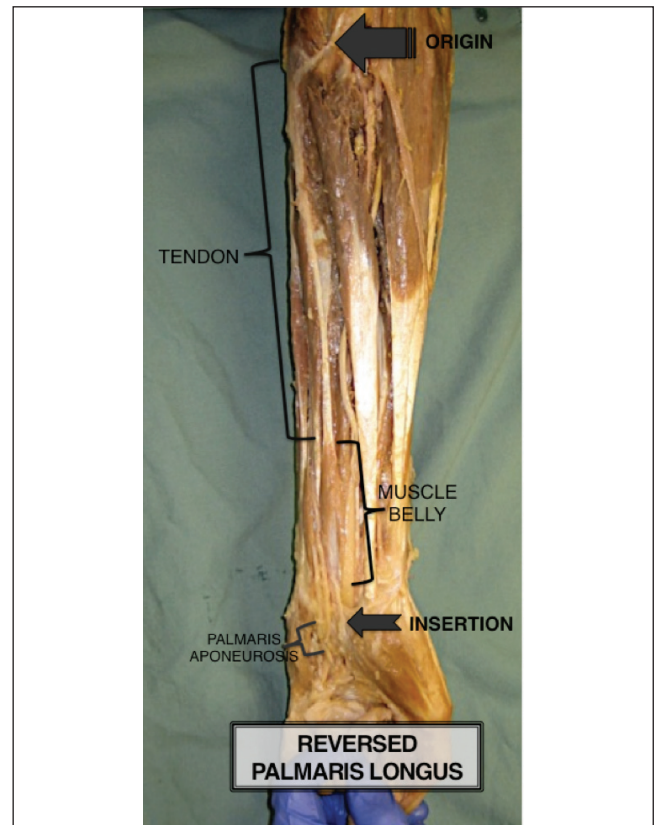


Figure 1 Anomalous reversed palmaris longus muscle found during cadaveric dissection, illustrating the palmaris longus origin, palmaris longus insertion and palmaris aponeurosis, as well as the palmaris tendinous portion (proximal) and the palmaris muscle belly (distal)

Department of Anatomy and Cell Biology, College of Medicine, University of Saskatchewan, Saskatoon, Saskatchewan

Correspondence and reprints: Dr Adel Mohamed, Department of Anatomy and Cell Biology, University of Saskatchewan, 3D01.16 Health

Science Building, 107 Wiggins Road, Saskatoon, Saskatchewan S7N 5E5. Telephone 306-966-4085, fax 306-966-4298,

e-mail adel.mohamed@usask.ca

Several authors have described the PL muscle as a mere phylogenetically degenerate metacarpophalangeal flexor because of its clinical insignificance and its numerous anatomical variations (3-5). However, the less common variants can lead to pathological conditions due to the narrow topographical relationship between the PL and the median nerve, causing median nerve compression (6).

Agensis 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 (7-9).

All other anatomical variants combined account for those found in approximately 9% of the population (8). 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 (9).

In the present case, the PL had a long tendinous origin proximally and a muscular portion distally. Since the initial description of a reversed PL in 1916 (10), several cases have been reported in the literature together with the clinical implications (11-14).

The reversed muscle belly can divide into separate muscular slips, which can insert into the flexor retinaculum, or onto the flexor carpi radialis tendon and volar carpal ligament (15). Thus, patients with a reversed PL may present with development of edema and inflammation accompanied by a bluish discoloration leading to numbness or pain in the volar aspect of the distal forearm. This results in a reduction of hand function usually exacerbated by wrist flexion (9).

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KEY POINTS

- The PL is one of the anatomical structures most prone to exhibiting variance in the human body.
- Understanding the anatomical variations of the PL is essential due to its crucial role during surgery as a landmark guide and as a reconstructive tool.

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