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Case Report

Anatomical variation of the palmaris longus muscle: finding in zone V flexor injury

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ABSTRACT

The palmaris longus is a muscle located on the anterior surface of the forearm, known for its significant anatomical variability. This ranges from its absence, the most common variant, to having multiple insertions or muscular bellies. The aim of the study is to highlight the uncommon anatomical variant diagnosed as an incidental finding and to contribute to the statistics of this type of pathology in our country. A case is reported involving a 14-year-old patient with no significant medical history who sustained a cut injury. Surgical exploration through the previous wound was conducted by the plastic surgery department at the General Hospital of Mexico (2023). The incidental finding revealed complete laceration of both tendons of the palmaris longus muscle, prompting the repair of both tendons. The bifid palmaris longus is a rare anatomical anomaly, not previously described in the statistics of our country. Therefore, the significance of reporting this anatomical variant as an incidental finding is noteworthy.

Keywords: Palmaris longus, Flexor carpi ulnaris, Flexor carpi radialis

INTRODUCTION

The palmaris longus muscle is a slender muscle with a short belly that is part of the anterior compartment of the forearm. It is located in the group of the most superficial muscles, medial to the flexor carpi radialis muscle and lateral to the flexor carpi ulnaris. It consists of a fusiform muscular belly from the proximal third to the middle third, and in the distal third, its composition becomes tendinous. Its origin is from the medial epicondyle of the humerus with insertion into the palmar fascia, as well as tendinous fibers towards the flexor retinaculum. The innervation is provided by the median nerve, and its blood supply comes from the anterior ulnar recurrent artery. The palmaris longus muscle has the function of weakly flexing the wrist as an accessory flexor muscle. It also anchors the palmar fascia, helping to tighten the skin on the anterior surface of the hand. Secondarily, it assists in abducting the thumb. The palmaris longus muscle is one of the muscles that exhibits the greatest variability in humans. Its absence or agenesis is considered the most common anatomical anomaly worldwide, ranging from 1.5% to 63.9%, as reported by Ioannis and colleagues in 2015, in a literature review covering the period from 1944 to 2014. A study conducted in 2019 by Yammine described nine types of variations in its insertion and shape, including the classic form, bifid tendon (2%), trifurcated tendon, proximally divided duplicated tendon (1.36%), communicating sliding, with the flexor carpi ulnaris, central muscular belly with a distal or bifurcated tendon, inverted muscle (1.9%), duplicated muscular belly (5.1%), and absence of the palmaris longus muscle, ranging from 4.0% to 53.19%. The objective of the study is to highlight the uncommon anatomical variant as an incidental finding and contribute to the statistics of this type of pathology in our country.

CASE REPORT

A 14-year-old male with no significant medical history was presented to the plastic and reconstructive surgery department at the General Hospital of Mexico with a cut

injury on the anterior surface of the right forearm in the V flexor zone. Physical examination revealed limitation in the flexion of the radiocarpal joint and the distal interphalangeal joint. X-rays ruled out bone involvement. Surgical intervention with sedation and local anesthesia was performed. During exploration through the wound, dissection was carried out through planes until all structures corresponding to each group of muscular planes were visualized. A total laceration of the flexor carpi ulnaris was identified, and incidentally, two tendons of the palmaris longus muscle were found to be completely lacerated, along with a laceration of the fourth flexor digitorum profundus (Figure 1). Following the identification of these structures, tenorrhaphy with modified Kessler stitches was performed for the fourth flexor digitorum profundus, and tenorrhaphy of the flexor carpi ulnaris with modified Kessler locking suture was carried out. The pulvertaft technique was employed with a graft from one tendon of the palmaris longus and continuous suturing using the Krakow-type locking loop, as described by Echeverria and colleagues in 2022. The remaining palmaris longus tendon was sutured with a modified Kessler stitch (Figure 2). The skin was closed with simple sutures, and a dorsal splint was applied. Rehabilitation was initiated 24 hours post-surgery.

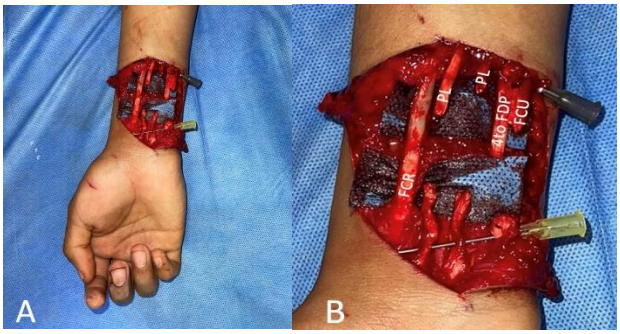

Figure 1: (A) Injury in zone V flexor, and (B) FCR, FCU, PL, 4th FDP.

Figure 2: (A) Tendon repairs, (B) tenorrhaphy with modified Kessler stitches of the 4th flexor digitorum profundus, (C) tenorrhaphy of the flexor carpi ulnaris with modified Kessler locking suture, pulvertaft with graft from a palmaris longus tendon, and continuous suturing with Krakow-type locking loop, and (D) palmaris longus with modified Kessler.

DISCUSSION

According to the literature consulted during this case report, it is observed that most research on anatomical variations in the forearm, particularly the palmaris longus muscle, is diagnosed through cadaveric dissections, except for its absence, which is manifested through clinical tests. The palmaris longus muscle exhibits the highest variability in the forearm, as reported in studies by Hagedorn and colleagues in 2021, conducted through cadaveric dissections.[4] This case report is thus conducted, as it is one of the few cases reported in living individuals, making most of these variants go unnoticed, with only incidental reports. According to the article by Hagedorn and colleagues, only three variants of the palmaris longus with three heads, having different insertion sites, had been reported, representing a low-incidence variant similar to the palmaris longus bifidus reported in this case.[4] It is essential to note that, among the variants the palmaris longus muscle may present, only one may cause symptoms, namely the inverted palmaris longus muscle, as mentioned by Georgiev and colleagues.[5] The significance of the palmaris longus muscle, and its presence, lies in its being the primary choice as a tendon donor for various reconstructive surgical options due to its length, diameter, and widespread availability. Therefore, it is crucial to identify its presence through clinical tests or ultrasound examinations, as mentioned by Pulakunta and colleagues.[6] The importance of reporting this incidental finding lies in its contribution to the statistics of such variants. Given the rarity of this pathology, its occurrence is not commonly reported in our country.

CONCLUSION

The anatomical variations of the palmaris longus muscle are not uncommon, especially when considering its absence, which varies in different regions. The bifid palmaris longus is a rare anatomical anomaly, not described in the statistics of our country. Therefore, the importance of reporting this anatomical variant as an incidental finding is significant.

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