ANATOMICAL VARIATION OF THE PALMARIS LONGUS MUSCLE: A CASE REPORT

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ABSTRACT
Palmaris longus muscle is one of the common flexor muscles of the forearm. It is one of the most variable muscles and is having immense importance in doing the surgery of the wrist where good orientation is very essential. The variations of this muscle cause compression of the median nerve in the wrist and produce the symptoms of Carpal tunnel syndrome. In routine dissection class of 1st professional MBBS course in NEIGRIHMS, Shillong, in a male cadaver we observed variations of palmaris longus on both the forearm.

Keywords: Palmaris Longus, Anatomic Variations, Carpal Tunnel Syndrome

INTRODUCTION
Palmaris longus is a long, slender and fusiform muscle of the forearm and lies medial to flexor carpi radialis. It takes origin from the medial epicondyle of humerus by the common flexor tendon and from adjacent intermuscular septa and deep fascia. It converges on a long tendon, which passes superficial to the flexor retinaculum. A few fibers leave the tendon and interweave with the tranverse fibers of the retinaculum but most of the tendon passes distally. As the tendon crosses the retinaculum it broadens out to become a flat sheet which becomes incorporated into the palmar aponeurosis. Palmaris longus is often absent on one or both sides. The muscle is innervated by the median nerve (C7 and C8) which lies partly between the tendons of palmaris longus and flexor carpi radialis at the wrist joint (Standring, 2008). The Palmaris longus muscle undergoes a process of phylogenetic degeneration (William and Straus, 2005). It is a weak flexor of wrist and anchors the skin and fascia of the hand against shearing forces in a distal direction (Sinnatamby, 2011).

CASES
During the routine cadaveric dissection in the practical classes for the medical students of 1st professional MBBS (Batch 2014-2015) of NEIGRIHMS, Shillong, Meghalaya, India, the authors observed the variations of palmaris longus muscle on both the forearm in a 63 years old male cadaver.

Figure 1: Showing the palmaris longus muscle of the right forearm with long tendon proximally and large muscular belly distally (MB = Muscular Belly, T = Tendon)
The palmaris longus on the right forearm was originated as a long tendon with a normal origin from the medial epicondyle of humerus and had a large muscle belly which was inserted directly into the superficial aspect of the flexor retinaculum (figure 1).

The palmaris longus on the left forearm had a long tendentious origin from the medial epicondyle of the humerus with a large belly at the middle part of the muscle. The muscular belly was inserted as tendon which was divided into superficial and deep slips. The superficial slip was inserted directly into the superficial aspect of the flexor retinaculum while the deep slip of the tendon of palmaris longus showed a descendant pathway deep to the flexor retinaculum (Figure 2a and 2b).

**Figure 2(a):** Showing the palmaris longus muscle of the left forearm with long tendon proximally and a large muscular belly (MB = Muscular Belly, T = Tendon)

**Figure 2(b):** Showing the palmaris longus muscle of the left forearm with long tendon proximally and a large muscular belly and superficial and deep slips of tendons distally (MB = Muscular Belly, T = Tendon, TD = Deep slip of tendon, TS = Superficial slip of tendon)

**DISCUSSION**

Palmaris longus is one of the most variable muscles in both number and form (Yildiz et al., 2000) and is phylogenetically classified as a retrogressive muscle; i.e., a muscle with a short belly and a long tendon (Eric et al., 2010; Thompson et al., 2001). Its tendon may be divided into two or three; it may show aberrancy of attachment at its origin or insertion or the muscle may be completely absent (Reimann et al., 1944; Bergman et al.). It was observed that about 11% of bodies palmaris longus was absent and was
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more common in females and on the left side (Depuydt et al., 1998). Agenesis of the palmaris longus has been attributed to Mendelian characteristics. The absence of the muscle had been described as ranging from a high of about 25% to 16% in white Caucasians (Trohat et al., 1990; Thompson et al., 2001; Webbe et al., 1992) to a low of 4% in mongoloids (Reimann et al., 1944; Sebastin et al., 2006).

The muscle may be digastric or fleshy throughout its entire length. The muscle may have a proximal tendon as well as a distal one. It may be fleshy distally and tendinous proximally. It may be reduced to a mere tendinous band. There may be two palmaris longus muscles. The additional muscle may arise from the medial intermuscular septum, biceps or brachialis, the fascia of the forearm proximally or one of the neighboring muscles, the coronoid process or the radius (Bergman et al., 1984). The muscle may be doubled at its proximal end, with the additional slip arising from one of the sites just mentioned. The insertion of the muscle is also highly variable. It was seen that it was attached to the fascia, the tendon of flexor carpi ulnaris, flexor retinaculum, pisiform bone, scaphoid bone, abductor pollicis brevis, fascia or muscles of the hypothenar eminence, one of the flexor tendons or near the metacarpophalangeal joint (Bergman et al., 1984; Backhouse and Churchill–Davidson, 1975).

Various anomalies of the origin, course and insertion of the palmaris longus muscle have been described by different workers. It was reported that the palmaris longus had a distal belly and was inserted deep to the flexor retinaculum (Backhouse and Churchill–Davidson, 1975). Roberts reported accessory palmaris longus muscle which appeared to compress the ulnar nerve during repeated contractions (Roberts, 1972).

Conclusion

Palmaris longus is considered as an accessory muscle and not essential for normal function of the hand (Eric et al., 2011; Stecco et al., 2009). The belly of palmaris longus muscle situated distally may produce symptoms of median and ulnar nerves compression. However, an asymptomatic muscle may also be of interest in clinical situations because an unexpected muscular belly in the wrist region can cause difficulties in the interpretation of local radiological images.

Palmaris longus tendon is commonly used as a source of graft material by surgeons because it fulfills the necessary requirements of length, diameter and availability and can be used in various reconstructive surgeries. Therefore, every surgeon, radiologist as well as the clinicians must be aware of the variations of palmaris longus muscle.

REFERENCES


