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Study on Structural Variations of Palmaris Longus Muscle

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Abstract:

Aim: To find out the frequency of structural variations of Palmaris longus muscle in cadavers.

Materials and Methods: The structural variations of Palmaris longus muscle were studied in 60 dissected formalin fixed upper limb specimens of Anatomy department of Chettinad Hospital and Research Institute, Chennai.

Result: out of 60 upper limb specimens 2 specimens showed reverse Palmaris longus muscle and 1 specimen showed whole length as a muscular part of Palmaris longus muscle.

Conclusion: these types of rare variations lead to compression of distal part of median nerve so surgeons and clinicians should be aware of these types of variations before going to management of median nerve compression syndrome.

Keywords: *Palmaris longus, median nerve compression syndrome*

1. Introduction

Palmaris longus (PL) is a well-known, thin, slender, fusiform shape, superficial group of flexor compartment muscle of forearm, located in between Flexor Carpi Radialis (FCR) and Flexor Carpi Ulnaris (FCU) muscle. It is a small vestigial muscle that is phylogenetically degenerating type like human vestigiality of the human appendix, tailbone, wisdom teeth, and inside corner of the eye.

Although the function is very less, it receives the attraction of the orthopedicians, hand and reconstructive surgeons, cosmetic and plastic surgeons. It is commonly used by hand surgeons for tendon transfers, second stage of tendon reconstruction, pulley reconstruction as well as tendon graft. Plastic surgeons also utilise the palmaris longus in restoration of lip and chin defects.

Identification of PL is very important to clinicians for find out the injection site during administration of medicine/corticosteroids in carpal tunnel to relieve the pain of carpal tunnel syndrome/arthritis and in median nerve wrist block or compression syndrome.

Palmaris longus muscle most common variation was agenesis. It is one of the most variable muscles in the human body. It varies in the incidence of its absence, form, attachment, duplication and its ability of having accessory slips and substitute structures.

2. Materials and Methods

The study was carried out 60 (30 Right & 30 Left) formalin fixed upper limbs specimens in the department of anatomy at Chettinad hospital and research institute during routine dissection of undergraduate teaching period.

A vertical incision were made in the center of the anterior surface of the forearm from the cubital fossa to the distal transverse crease of the wrist and Incised the skin transversely across the front of the wrist, Reflected the skin flaps medially and laterally to exposed the muscle from its origin to its insertion and find out any variations are present or not.

Out of 60 upper limb specimens 2 specimens were present reverse Palmaris longus muscle and 1 specimen present whole length as a muscular part of Palmaris longus muscle.

S. No	Type of variation	Number of specimens	Incidence of variations
1.	Reverse PL	2	3.3 %
2.	Whole length as a muscle belly	1	1.7 %

Table 1: type of variation and its incidence

2.1. Variation 1

Reverse Palmaris longus muscle were observed in 2 upper limb specimens. Both the variant originated from medial epicondyle and inserted into flexor retinaculum, but origin part was tendinous and towards the insertion muscle belly was present as like below picture (Copy right @ Janet M. COPE et al).



*Figure 1: Reverse Palmaris Longus
(Copy right @ Janet M. COPE et al)*

2.2. Variation 2

Variant arise as a tendon in the medial epicondyle of humerus, inserted into flexor retinaculum as a small tendinous part but rest of the whole muscle as a muscular part.

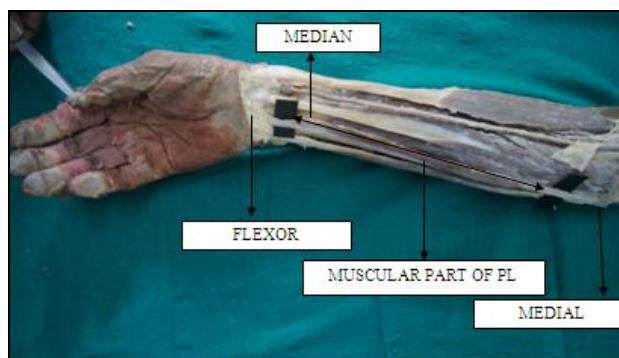


Figure 2: Whole Muscle as a Muscle Belly

3. Discussion

Generally, common variations in palmaris longus anatomy were thought to be agenesis of PL muscle but rare variants also many authors reported like reverse PL, different insertion site, duplication of muscle, etc; In the present study 2 specimens having reverse PL type of variation, it showed the incidence in overall 3.3% in these study. However, several authors have described variations of the reverse Palmaris longus muscle (janet M. cope et al, Schuurman A H) but first reported by Captain John T. Morrison in 1916 as an incidental, post-amputation finding. It may cause symptomatic median nerve compression like paresthesia in the median nerve distribution areas and swelling on the flexor aspect of the wrist resembling tenosynovitis. Clinicians should be aware of this variant and differentiate the diagnosis of carpal tunnel syndrome or median nerve compression syndrome

Another most rare variation was observed in this study that was whole PL muscle was muscular part, in these variation was rare one, it also compresses the distal part of median nerve and the incidence was 1.7%.

The normal Palmaris longus muscle is functionally not more useful in human beings but it is useful in various reconstructive surgeries. As present study showed rare types of less common variants of the PL muscle may cause various pathologic affects that may new to many surgeons and clinicians. All hand and reconstructive surgeons should be aware of these type anatomical variations of the palmaris longus muscle, not only because of the usefulness of the Palmaris longus tendon in the reconstructive surgical procedures and management of median nerve compression syndrome but early recognition of the rare variants can help avoid repetitive, unsuccessful

surgical exploration or other therapeutic measures. Early detection of rare variants of Palmaris longus can be challenging preoperatively. Most of the surgeons would not consider imaging studies as part of their diagnostic workup of carpal tunnel syndrome and median nerve compression syndrome. Most of the time, a diagnosis of median nerve compression syndrome is based on clinical findings along with the results of EMG studies. A recent study suggests that MRI may helpful diagnosis method of outcome from carpal tunnel release better than EMG studies. So detection of Palmaris longus muscle through MRI imaging would be more helpful method for preoperative planning for various reconstructive procedures like management of carpal tunnel syndrome and median nerve compression syndrome.

With this study, we have conveyed strongly current knowledge of the anatomical variations of the Palmaris longus muscle was important one for reconstructive surgeons and clinicians.

4. Conclusion

These types of rare variations leads to compression of distal part of median nerve so surgeons and clinicians should be aware of these type of variations before going to management of median nerve compression syndrome and carpal tunnel syndrome.

5. References

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