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MORPHOLOGICAL VARIANT OF FORE ARM MUSCLES- PALMARIS LONGUS MUSCLE.

Anatomy

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ABSTRACT

INTRODUCTION : Palmaris longus muscle originates from medial epicondyle and forms long slender tendon.The palmar aponeurosis is degenerated part of Palmaris longus. Its nerve supply is from median nerve,it is weak flexor.Hence the study of this muscle and its variation is important.

AIMS AND OBJECTIVES: To study the variations in the Palmaris longus and to discuss the clinical and surgical implications of these variations.

METHODOLGY: This study was conducted in Department of Anatomy of Osmania medical college , koti, Hyderabad. During routine undergraduate dissection on human cadavers(22upperlimbs); 20males & 2female cadavers were dissected for the study. The cadavers with visible trauma, pathology or prior surgeries were excluded from the study. Routine dissection of the upper limb was followed. During the dissection of the anterior compartment of forearm, the Palmaris longus muscle was identified & carefully dissected. At first, the origin was confirmed and then, it was traced towards its insertion. Any variations found were noted and photographed. The results were analysed and compared to previous studies.

RESULTS: Unilateral absence of Palmaris longus muscle was found in two male cadavers on left side .The percentage of absence of Palmaris longus muscle is 9 % [one left side -4.5% and the second left -4.5%].

CONCLUSION: Palmaris longus muscle is one of the common flexor muscles of the forearm. The Palmaris longus muscle is considered as the most variable and one of the degenerated muscle of the human body. Precise knowledge of variations in the Palmaris longus is essential for surgeons, orthopaedicians, plastic surgeons, anatomists and researchers.

KEYWORDS

palmaris longus, flexor digitorum superficialis, flexor carpi ulnaris, flexor carpi radialis.

INTRODUCTION

Palmaris longus is described as a slender superficial flexor muscle of the forearm. The muscle belly is fusiform in shape which takes origin from medical epicondyle of humerus in common with the other superficial flexor muscles of forearm, just medial to flexor carpi radialis muscle. It converges to form a longtendon, which passes superficial to flexor retinaculum and then the tendon broadens out to form a flat sheet which gets attached to the apex of palmar aponeurosis. Palmaris longus muscle is innervated by median nerve (C7,C8) and "phylogenetically it is a degenerate metacarpophalangeal joint flexor" and a weak flexor of the wrist joint. At the wrist, median nerve lies partly undercover of Palmaris longus or between the tendons of flexor carpi radialis and Palmaris longus [1].Palmaris longus is often absent on one or both sides. Sebastin and co-workers (2005) reported that the absence of the Palmaris longus is not correlated with a decrease in the strength of one's grip or pinch [2].

The knowledge of the anatomical variations of Palmaris longus is important due to its clinical significance. Variations of Palmaris longus are common but asymptomatic; they may become important during surgeries .The study is helpful for surgeons performing tendon grafting, plastic and reconstructive surgeries.

MATERIALS AND METHODS

The dissection was carried in department of anatomy Osmania medical college, koti telangana. During routine undergraduate dissection, 22 formalin fixed human cadavers(22upperlimbs); 20 males & 2 female cadavers were dissected for the study. The cadavers with visible trauma, pathology or prior surgeries were excluded from the study. During the dissection of the anterior compartment of forearm, the Palmaris longus muscle was identified & carefully dissected. At first, the origin was confirmed and then, it was traced towards its insertion. Any variations found were noted and photographed. The results were analysed and compared to previous studies.

RESULTS

Unilateral absence of Palmaris longus mucle was found in two male cadavers on left side .The percentage of absence of Palmaris longus muscle is 9 % [one on left side -4.5% and second one left -4.5%]FIG-1 AND FIG2.

FIG 1

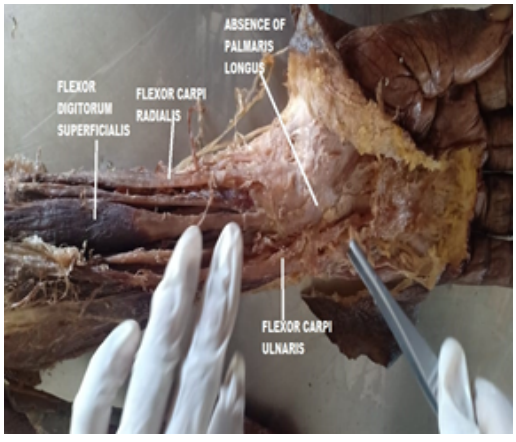

FIG 2

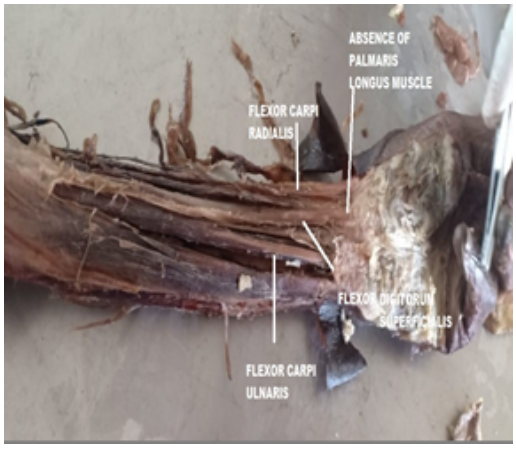

TABLE -1: Prevalence of the Palmaris longus muscle, a comparison between different studies found in the literature.

Study in different population	Total sample	Present bilaterally		Absent bilaterally		Unilateral Absence (left)		Unilateral Absence (right)	
		n	%	N	%	n	%	n	%
Zimbabwean[6]	890	-	-	5	0.6	-	-	-	-
Southern Indian[7]	30	-	-	1	3.3	3	10	-	0
Asian [2]	418	394	94.3	7	2	12	2.9	5	1.2
American[8]	362	302	83.4	30	8.3	13	3.6	17	4.7
North American[9]	120	-	-	6	5	-	-	-	-
North American[10]	186	156	83.9	18	9.7	0	0	4	2.2
Amazon Indian[11]	379	-	-	10	2.6	-	-	-	-
European [12]	300	228	76	26	8.7	20	6.7	29	9.7
Malaysian [13]	450	-	-	13	2.9	-	-	-	-
Indian [14]	500	414	82.8	40	17.2	31	6.2	15	3
Iranian [15]	64	-	-	5	7.8	-	-	-	-
Nigerian [16]	600	188	31.3	112	18.75	150	25	150	25
Global prevalence (Average %)	5005	-	75	-	7.6	-	7.8	-	6.6
Present study	22	20	91	-	-	2	9	-	-

DISCUSSION

The focal point in the present study was to determine the incidence and morphology of the Palmaris longus muscle. The results of the above-mentioned were then compared with what has been reported in the literature in studies done on other population groups. From the information gained from this study may aid surgeons, using these muscles as grafts or flaps in reconstructive surgery.

Palmaris longus absence will not affect the function of the wrist significantly [4]. However, the congenital absence of this muscle can be seen as a disadvantage when the use of this muscle is indicated for use in reconstructive surgery.Carlson and co-workers (1993) even mentioned a Palmaris longus with more than one tendon [3].

Morphological significance: With the development of forelimb as a prehensile organ, the long flexors muscles of the forearm, Palmaris longus muscle started degenerating in a caudo cranial direction. Degeneration of functionless muscle occurred much earlier in phylogenetic forebearers likes Gibbon and Orangutan.Chimpanzees and apes show maximum degeneration, only 25% of Gorillas have got Palmaris longus muscle. Palmaris longus is more degenerate in apes and monkeys than in man[5].

Clinical Significance:

The results of this study confirms , the Palmaris longus tendons of ideal width and strength would be used as grafts in reconstructive surgeries.

CONCLUSION:

Palmaris longus muscle is one of the common flexor muscles of the forearm. Phylogenitically classified as retrogressive muscles because it has got a short belly and long tendon. The Palmaris longus muscle is considered as the most variable and one of the degenerated muscle of the human body.

It has been the subject of several cadaveric as well as in vivo studies because of its clinical importance as a donor tendon. Although it is well known that there is a wide variation in the reported prevalence of Palmaris longus absence in different ethnic groups, the study of such variations including its presence or absence was taken up not only to update knowledge but also to help the surgeons in various surgeries.
Absence of palmarislongus unilaterally on left side in two male cadavers total absence is 9%. Knowledge of these variations is important for surgeons before harvesting the tendons for graft.

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