Research Article

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A STUDY ON MORPHOLOGY OF PALMARIS LONGUS

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Abstract: Palmaris longus muscle is one of the highly variable muscles of flexor compartment of forearm. In man, due to loss of prehension, the muscle became an almost vestigial structure, more tendinous than muscular and started becoming unilaterally or bilaterally agenetic. This muscle has got an evolutionary interest along with a high degree of importance in tendon graft surgeries. In this study the morphology of palmaris longus muscle was studied using routine dissection procedure in a total of 50 upper limbs, out of which 45 (90%) upper limbs showed normal anatomy. Two upper limbs (4%) showed reverse palmaris longus, one upper limb (2%) showed proximal and distal tendinous portion with a long middle belly, (here the muscle belly was much longer when compared to the combined length of the proximal and distal tendons). These variations in their morphology were noted and their clinical significance was discussed.

Keywords: Palmaris longus, Tendon Graft, Tendon Transfer, Variations

INTRODUCTION

Palmaris longus is a highly variable flexor muscle of the forearm. It has a short slender belly and a long tendon. It originates from the medial epicondyle of the humerus as a common flexor tendon along with other flexors of forearm and from the inter muscular septum and antebrachial fascia. It gets inserted to the flexor retinaculam and palmar aponeurosis.[1, 2, 3, 4] In this study different forms of variation in the morphology of Palmaris longus muscle and its clinical importance like auto graft in tendon transfer surgeries were also discussed.

MATERIALS AND METHODS

Study was conducted by dissection of cadavers of both sexes in the Department of Anatomy of Sree Mookambika Institute of Medical Sciences, Kulasekharam, Tamilnadu and in the Department of Anatomy of Sri Ramachandra Medical College and Research Institute, Chennai. The forearm was exposed and the morphology of palmaris longus was noted and their observations were tabulated.

RESULTS

In the present study of 50 upper limbs, palmaris longus was present only in 48 (96%) upper limbs. Two (4%) upper limbs showed absence of palmaris longus (Fig.1), 3 upper limbs (6%) showed variations in their morphology.

Out, of 3 variations 2 (4%) upper limbs had reverse palmaris longus (palmaris longus inversus) in the same cadaver (Fig.2). One upper limb (2%) had palmaris longus with proximal and distal tendinous portion and an unusually long middle belly (Fig.3) as shown in Table 1.

Table 1: Morphology of Palmaris longus observed in this study

Morphology		No. of upper limbs	Percentage (%)
No variations		45	90%
Morphological variations observed in the palmar longus in this study	Absent	2	4%
	Reverse palmaris longus	2	4%
	Proximal and distal tendon with long middle belly	1	2%
Total		50	100%

Fig. 1: Absent of palmaris longus

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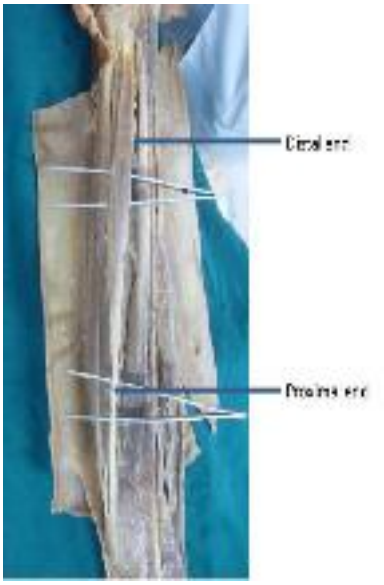

Fig.2: Reverse Palmaris longus

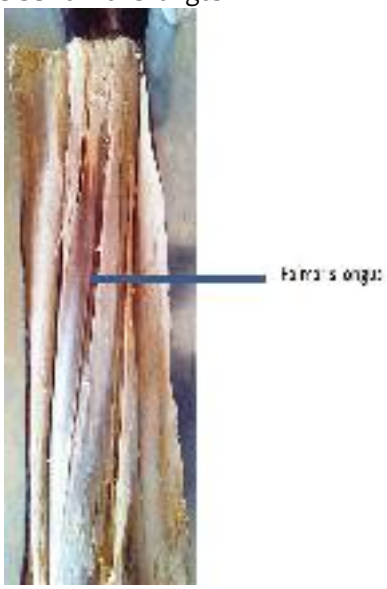

Fig.3: Proximal and Distal Tendon with long middle belly

DISCUSSION AND CONCLUSION

Palmaris longus is a phylogenitically degenerating muscle which has become an almost vestigial structure. Even though it has become functionally insignificant, it serves as an ideal auto graft for various reconstructive surgeries.

Many variations are noted in the morphology of palmaris longus, such as absent palmaris longus, double tendon, reverse palmaris longus[5], abnormal origin, abnormal insertion etc., which may result in carpal tunnel syndrome[6], guyons syndrome[7] or it may present as an soft tissue mass in the front of forearm and hence the knowledge of various variations of palmaris longus is very essential for surgeons and radiologist for diagnosis and treatment of some of the diseases in the upper limb caused due to such variations like palmaris longus opponensplasty[8], replacement of first dorsal interosseous muscle[9], palmaris longus abductor plasty for severe thenar atrophy[10], Lumbrical replacement for ulnar claw hand, Reconstruction of tendo calcaneus[11], Reconstitution of glottis[12] and also for harvesting palmaris longus tendon graft for tendon transfer surgeries.

Palmaris longus is the first choice for harvesting of donor graft in tendon transfer surgeries and it does not cause much of functional deformity[13], hence it is used as an ideal replacement graft for long flexors of fingers and thumb.[14]

Over use of Reverse palmaris longus may result in hypertrophy of distal muscular part and may result in median nerve or ulnar nerve compression.[1, 4, 5]

In case of middle long belly a simple hypertrophy of such muscular part may present as a soft tissue mass in the forearm[15], hence Radiologist and Surgeons should be aware of such variations before making a diagnosis of soft tissue mass in the front of forearm.

Absence of palmaris longus is a common entity, which is seen in about 11% of upper limbs.[16] Absence of palmaris longus may be inherited.[17] One should look for the presence of palmaris longus using simple clinical test[18, 19] before planning to use palmaris longus tendon graft for reconstructive surgeries.

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REFERENCES

1. Gray H, Bennister LH, Berry MM and Williams PL, Gray's Anatomy, The Anatomical Basis of Medicine and Surgery, 38th edition, London, Churchill Livingstone, 1999, 853.

2. Sharma DK, Shukla CK, Sharma V, Clinical assessment of palmaris longus and its association with gender, body sides, handedness and other anomalies in population of central India, J Anatomical society of India, 2012, 61, 1, 13-20.

3. Jones FW, The Principles of anatomy as seen in the hand, Baillere, Ondon, Tindall and Cox, 1941.

4. Valeria Paula Sassoli Fazan, Reversed Palmaris Longus muscle and median nerve relationships, case report and literature review, Braz J Mprphol Sci, 2007, 24, 2, 82-91.

5. Cope JM, Looney EM, Craig CA, Gawron R, Lampros R, Mahoney R, Median nerve compression and reverse palmaris longus, International Journal of Anatomic variations, 2009, 2, 102-104.

6. Schuurman AH, Van Gils APG, Reversed palmaris longus muscle on MRI: report of four cases, European Radiology, 2000, 10, 8, 1242-1244.

7. Regan PJ, Feldberg L, Bailey BN, Accessory palmaris longus muscle causing ulnar nerve compression at the wrist, J Hand Surg Am, 1991 jul, 16, 4, 736-738.

8. Foucher G, Malizos C, Sammut D et al, Primary palmaris longus transfer as an opponensplasty in carpal tunnel release A series of 73 cases, J Hand Srg Br, 1991, 16, 56-60.

9. Hirayama T, Atsuta Y, Takemitsu, Palmaris longus transfer for replacement of the first dorsal interosseous, J Hand Surg Br, 1986, 11, 1, 84-86.

10. Terrono AL, Rose JH, Mulroy J et al, Camitz palmaris lungus abductorplasty for severe thenar atrophy secondary to carpal tunnel syndrome, J Hand Surg 1993, 18A, 205.

11. Isenberg J, Fusi S, Achilles tendon reconstruction with composite forearm palmaris longus tendon free flap, Annals of plastic surgery, 1995, 34, 2, 209-211.

12. Chantrain G, Deraemaecker R, Glottic reconstruction after cricothyroidoepiglottopexy with a radial forearm free flap that includes the tendon of palmaris longus, Preliminary results and perspectives, Laryngoscope, 1994, 104, 8, 1035-1040.

13. Troha F, Baibak GJ, Kelleher JC, Frequency of the palmaris longus tendon in North American Caucasians, Ann Plast Surg, 1990, 25, 477-478.

14. Zeybek A, Gurunluoglu R, Cavdar S, Bayramiqli M, A Clinical Reminder: a palmaris longus muscle variation, Ann Plast Surg, 1998, 41, 224-225.

15. Bencteux P, Simonet J, el Ayoubi L, Renard M, Attignon I, Dacher JN, Thiebot J, Symptomatic palmaris longus muscle variation with MRI and surgical correlation, report of a single case, Surg Radiol Anat, 2001, 23, 273-275.

16. Romanes GJ, Cunningham's text book of anatomy London, New York and Toronto, Oxford university press, 1964, 331.

17. Wehbe MA, Mawr Bryn, Tendon graft donor sites, J Hand Surg, 1992, 17A, 1130-1132.

18. Mobin N, Saraswathi G, Anatomical variation of palmaris longus muscle, Anatomica Karnataka, 2010, 4, 2, 74-72.

19. Ali AA, Pawm, Kadhim J, Anamalous V shape palmaris longus tendon, two cases, J med cases, 2010, 1, 2, 68-70.

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