Original Article

Congenital Absence of Palmaris Longus Muscle Frequency in Hayatabad Medical Complex, Peshawar

Congenital Absence of Palmaris Longus Muscle

Zainab Rehman[1], Shazia Iftikhar[1], Shabnum Aamir[1], Falak Naz[1], Shagufta Sultana[1] and Parkha Rehman[2]

ABSTRACT

Objective: The objective of the study was to determine the absence of Palmaris Longus muscle in patients presenting at Hayatabad medical complex, Peshawar.
Study Design: Descriptive Cross Sectional study.
Place and Duration of Study: This study was conducted at the Hayatabad Medical Complex, Peshawar for a period of six months from January 2019 to June 2019.
Materials and Methods: A total of 432 cases which included male and female both of all ages were included in the study. Schaeffer Test was performed on them to find out the absence of Palmaris longus tendon.
Results: Out of 432 subjects, 202 females and 230 males, 70 (16.2%) were found to have absence of Palmaris longus muscle. Out of this 58 (82.8%) were female and 12 (17.1%) were male.
Conclusion: The findings of this study highlight the variation in the presence of Palmaris longus muscle.
Key Words: Palmaris Longus, vestigial, tendon graft, agenesis

Citation of article: Rehman Z, Iftikhar S, Aamir S, Naz F, Sultana S, Rehman P. Congenital Absence of Palmaris Longus Muscle Frequency in Hayatabad Medical Complex, Peshawar. Med Forum 2021;32(9):115-117.

INTRODUCTION

In humans Palmaris longus muscle is one of the most variant muscles[1]. It has no active function and is generally accepted as a vestigial muscle. Its absence does not cause any deformity but it has great significance in tendon transfer during reconstructive plastic surgeries as well as hand procedures[2,3]. It is also used as tendon grafts in otolaryngology and ophthalmology (e.g. facial paralysis treatment, restoration of lip and chin defect, correction of ptosis, augmentation of lips, etc.

Palmaris longus muscle is a thin and spindle shaped muscle belonging to the superficial flexor muscles of the forearm which has a short belly and a long tendon. It lies in the volar compartment of the forearm, arising from the medial epicondyle of the humerus and its tendon runs between the flexor carpi radialis and flexor carpi ulnaris[4].

1. Department of Anatomy, Khyber Medical College, Peshawar.
2. Department of Anatomy, Nowshera Medical College, Nowshera.

Correspondence: Shazia Iftikhar, Assistant Professor, Anatomy, Khyber Medical College, Peshawar.
Contact No: 03000452113
Email: shaziaijaz28@yahoo.com

Received: April, 2021
Accepted: July, 2021
Printed: September, 2021

It also lies anterior to the transverse carpal ligament and cross the flexor retinaculum superiorly. It inserts into the palmar aponeurosis. Its nerve supply is from the median nerve and blood is supplied by the ulnar artery. It helps to flex the wrist, abduct the thumb and anchor the fascia but these functions are negligible and its absence does not cause any handicap[5-7].

Many studies have been conducted to find out the frequency of congenital absence of Palmaris Longus Muscle which have shown variations in this muscle. Studies have revealed that almost 15% of the population could be lacking this muscle either unilaterally or bilaterally[8,9.] Many tests can be performed to confirm the presence of this muscle which includes the Schaeffer's test, Mishra Test, Thompson Test and Phushpa kumar Test. In addition to these standard test other tests can be done to confirm the presence of Palmaris Longus muscle which includes the Lotus sign test, the four-finger sign, the Cangata test, the Bhattacharya test and the Hiz-Ediz test.

This study was conducted to find out the frequency of congenital absence of Palmaris longus muscle in patients presenting at Hayatabad Medical complex as Palmaris Longus muscle tendon has great significance in tendon transfer and tendon graft.

MATERIALS AND METHODS

This study was a descriptive cross sectional review of data from Surgical ward of Hayatabad Medical Complex, Peshawar where Schaeffer test was performed on 432 patients over a six-month duration

which included 202 females and 230 males. Patients of all ages above 10 years without neurological deficit and previous injury/surgery on the hand or forearm were included. Schaeffer test involves moving the thumb in opposition towards the little finger with the wrist partially flexed. In this state, the palmaris longus muscle tendon is raised under the skin which can be observed and palpated. This test was performed to confirm the presence or agenesis of the muscle in both limbs.

RESULTS

Our study revealed that out of 432 patients, 70 patients had absence of Palmaris Longus muscle. 30(6.9%) patients had bilateral agenesis of the muscle among which 20(66.7%) were female and 8(26.7%) were male. In 24 (5.6%) patients Palmaris Longus muscle was absent in the left upper limb out of which 22(91.7%) were female and 2(8.3%) were male. In 16(3.7%) patients Palmaris Longus muscle was absent on the right side and among them 14(87.5%) were female and 2 were male (12.5%).

Table No.1: Frequency of absence of Palmaris longus Muscle

Absence	Total	Female	Male
Bilateral agenesis	30(6.9%)	20(66.7%)	8(26.7%)
Left hand agenesis	24(5.6%)	22(91.7%)	2(8.3%)
Right hand agenesis	16(3.7%)	14(87.5%)	2(12.5%)
Total	70(16.2%)	58(28.7%)	12(5.2%)

DISCUSSION

Palmaris longus muscle has been studied extensively due to its clinical importance and its variations. Absence of palmaris longus muscle does not cause any deformity hence it can be easily used during tendon transfer and as a graft[10-15]. Hence it is important for surgeons to know its variations. There is also variation in the occurrence percentage with its absence ranging from 1.5% to 63.7%[16-18]. The low percentages were reported in Zimbabwe (1.5%)[19-20], China (4.1%)[5] and South Korea (4.6%)[21-22] while the highest percentage of absence of Palmaris longus muscle was reported by Ceyhan and Mavt[8] which was 63.9%.

Our study revealed that bilateral agenesis (6.9%) was more common followed by left hand agenesis (5.6%) and that the absence of Palmaris Longus muscle was more common in females (28.7%) as compared to males (5.2%). Our study was similar to studies carried out by Osonagu et al[12] (3.1%) and Kose et al [15] (26.6%). Another study carried out by Sater et al (36.8%)[20] also revealed increased percentage of bilateral agenesis with the incidence more in females.

A study carried out by Karimi et al[22] in South Iran revealed the prevalence of absence of Palmaris Longus muscle to be 30.7% which was different to a study carried out in Tehran which reported the absence of Palmaris longus muscle to be 22.8%. Hence there is also variation in the absence of Palmaris longus muscles in different regions[13,14].

CONCLUSION

Palmaris Longus muscle is the most variant muscle. It has great importance in tendon transfer and tendon graft during reconstructive plastic surgeries like lip augmentation, facial paralysis treatment[13,14]. It also has significance in identifying median nerve during operations. Hence it is important to study its variations. Our study highlighted the fact that Palmaris Longus muscle is indeed one of the most variable muscle and the variations differ in different parts of the world.

Author's Contribution:

Concept & Design of Study:	Zainab Rehman
Drafting:	Shazia Iftikhar, Shabnum Aamir
Data Analysis:	Falak Naz, Shagufta Sultana, Parkha Rehman
Revisiting Critically:	Zainab Rehman, Shazia Iftikhar
Final Approval of version:	Zainab Rehman

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Enye LA, Osinubi AA, Saal U. The prevalence of agenesis of Palmaris longus muscle amongst students in two Lagos Based. Int J Morphol 2010; 28(3):849-54.
2. Alves N, Ramirez D, Deana NF. Study of frequency of the palmarislongus muscle in Chilean subjects. Int J Morphol 2011; 29(2):485-89.
3. O'Sullivan E, Mitchell BS. Association of the absence of palmaris longus tendon with an anomalous superficial palmar arch in the human hand. J Anat 2002;201(5):405–408.
4. Ruengsakulrach NW, Thompson BJ, Mockford GW. Cran: Absence of the palmaris longus muscle: a population study. Ulster Med J 2001;70(1): 22–24.
5. Sebastin SJ, Puhandrian ME, Lim AYT, Lim IJ, Bee WH. The Prevalence of Absence of the Palmaris Longus – A Study in a Chinese Population and a Review of the Literature. J Hand Surg Eur 2005;30(5):525-527.
6. Schaeffer JP. On the variations of the palmarislongus muscle. Anat Rec 1909;3:275-78.
7. Ali MS, Mirna P, Francis CS. The Variation in the Absence of the Palmaris Longus in a Multiethnic Population of the United States: An Epidemiological Study. Plastic Surg Int 2012;4.

8. Ceyhan O, Mavt A. Distribution of agenesis of palmarislongus muscle in 12 to 18 years old age groups. Ind J Med Sci 1997; (51):156-60.
9. Igbigbi PS and Sekitoleko OHA. Incidence of agenesis of the palmarislongus muscle in Ugandans. West African J Anat 1998;6(3):21-23.
10. Natsis K, Levvaa S, Totlisa T, Anastasopoulosa N, Paraskevasa G. Annals of Anatomy - Anatomischer Anzeiger; Three-headed reversed palmaris longus muscle and its clinical significance 2007;189(1): 97-101.
11. Keese GR, Wongworgawat MD, Frykman G. The Clinical Significance of the Palmaris Longus Tendon in the Pathophysiology of Carpal Tunnel Syndrome. J Hand Surg Eur 2006;31(6):657-660.
12. Osonuga A, Mahama HM, Brown AA, Osonuga OA, Serbeh G, Harding AN, et al. The Prevalence of Palmaris longus agenesis among the Ghanaian population. Asian Pacific J Tropical Dis 2012; 2:S887–S889.
13. Pai MM, Prabhu LV, Nayak SR, Madhyastha S, Vadgaonkar R, Krishnamurthy A, Kumar A. The palmaris longus muscle: its anatomic variations and functional morphology. Rom J Morphol Embryol 2008;49(2):215–217.
14. Yammine K. Clinical prevalence of palmaris longus agenesis: a systematic review and meta-analysis. Clin Anat 2013;26(6):709–718.
15. Kose O, Adanir O, Cirpar M, Kurklu M, Komurcu M. The prevalence of absence of the palmaris longus: a study in Turkish population. Arch Orthop Tr16.
16. Oluyemi KA, Adesanya OA, Odion BI, Ukwenya VO. Incidence of palmaris longus muscle absence in Nigerian population. Int J Morphol 2008; 26(2):305–308. auma Surg 2009;129(5):609–611.
17. Thompson NW, Mockford BJ, Cran GW. Absence of the palmaris longus muscle: a population study. Ulster Med J 2001;70(1):22–24.
18. Ertem K, Karakoc Y, Pepele D. The absence of palmaris longus tendon and its contribution to pinch strength in the Anatolian population. J Hand Surg Eur 2011;36(6):517–518.
19. Gangata H. The clinical surface anatomy anomalies of the palmaris longus muscle in the Black African population of Zimbabwe and a proposed new testing technique. Clin Anat 2009;22(2):230–235.
20. Sater MS, Dharap AS, Abu-Hijleh MF. The prevalence of absence of the palmaris longus muscle in the Bahraini population. Clin Anat 2010;23(8):956–961.
21. Kyung DS, Lee JH, Choi IJ, Kim DK. Different frequency of the absence of the palmaris longus according to assessment methods in a Korean population. Anat Cell Biol 2012;45(1):53–56.
22. Karimi-Jashni H, Karamatollah R, Abdolreza SJ. Agenesis of palmaris longus in southern of Iran: a polulation based study. Online J Biological Sci 2013;14(1):8.