

Clinical Assessment of Absence of Palmaris Longus Muscle in Marathwada Region

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Abstract

Introduction: Palmaris longus is a small vestigial muscle with long tendon and short belly. It is phylogenetically retrogressive. It may be absent in 15 % of individuals. Palmaris longus used as a popular tendon graft. *Aim:* The present study is done to assess absence of palmaris longus unilaterally or bilaterally by using simple clinical tests in both sexes on both sides. *Method:* We examined 200 subjects for the presence or absence of palmaris longus. Standard clinical tests were used to determine the presence or absence of palmaris longus tendon. Observations were analyzed by statistical method. *Result:* The study showed Palmaris longus was absent in 11 (5.5%) males and 9 (4.5%) females unilaterally. It was absent in 7 (3.5%) males and 4 (2%) females on left side. Chi square test was 0.073 and P value was 0.39 ($P < 0.5$). *Conclusion:* In present study we conclude that Palmaris longus was absent 10 % unilaterally and 6% bilaterally. Absence was more on left side than right side.

Keywords: Palmaris Longus; Tendon; Graft.

Introduction

Palmaris Longus is one of the most variable and most superficial flexor muscle of forearm. It is a slender, fusiform, spindle shaped muscle medial to flexor carpi radialis. As the tendon crosses the flexor retinaculum superficially it broadens out to become a flat sheet which is incorporated into the palmar aponeurosis.

The palmaris longus is restricted to the mammals and is best developed in species using the forelimb for weight bearing and ambulation. It is the most desirable tendon in reconstructive surgery like total maxillectomy, ptosis correction, total mandible and chin reconstruction. It is the first choice donor tendon as it fulfills the necessary requirements of length, diameter and availability. It can be used without

producing any functional deformity. It is considered to be the ideal choice for tendon graft [1].

When one take a closer look at the Palmaris Longus tendon its superficial location makes the process of harvesting easier and these makes the procedure less complicated and safer. Palmaris Longus is also said to be a dispensable tendon, absence of which will not affect the function of the wrist significantly.

The advantages of using the Palmaris Longus muscle in reconstructive surgery, include that it is expandable, it has a nonessential function, readily available and easy to harvest. The presence of the Palmaris Longus is easily determined by preoperative examination.

The Palmaris Longus is a popular tendon graft, used in various reconstructive surgeries [2]. It is often described as most variable muscle in human body and is phylogenetically classified as a retrogressive muscle i.e muscle with short belly and long tendon. Palmaris longus muscle has little functional use in human but has a great significance when used as a donor tendon.

Aim

The present study is done to assess absence of palmaris longus unilaterally or bilaterally by using simple clinical tests in both sexes on both sides.

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Material and Methods

We examined 200 subjects (100 male and 100 female) for the presence or absence of Palmaris Longus in relation with visualization of its tendon. Healthy subjects between 18 to 50 years were randomly selected. Subjects with congenital or acquired abnormalities of hand were excluded from the study. Procedure was explained to each subject and written consent was taken for the same. Study was approved by Ethical committee of our institute.

Clinical tests which were done

1. Standard Schaeffer's test [3]- Each subject was asked while the forearm in supination to oppose the thumb and little finger and flex the wrist. If the palmarislongus tendon present then it will form a protuberance under the skin. (Figure 1). If the tendon was not seen or palpable then 3 additional tests were done to confirm the absence.



Fig. 1: Standard Schaeffer's test



Fig. 2: Mishra's 1st test



Fig. 3: Mishra's 2nd test



Fig. 4: Pushpakumar's two - finger sign test

2. Mishra's 1st test [4]- Subject was asked to do passive hyperextension of fingers at metacarpophalangeal joints with active flexion of wrist (Figure 2).
3. Mishra's 2nd test - Subject was asked to do abduction of thumb against resistance with slight palmar flexion of wrist (Figure 3).
4. Pushpakumar's two - finger sign test [5]- Subject was asked to do full extension of index & middle finger with apposed thumb over medial two fingers (Figure 4).

If the tendon was not seen or not palpated then it was considered as absence of palmarislongus tendon. We observed absence of palmarislongus muscle on both side.

Our Observations were analyzed by statistical method using chi square test and p- value was calculated.

Observation & Result

We found following observations in our study

Table 1 shows that Palmaris Longus was present in 181 upper extremities in male and 175 upper extremities in female subjects.

Palmaris Longus was present in 85 male subjects and 83 female subjects subject bilaterally.

Unilateral absence of Palmaris Longus was found in 11 male subjects (5.5%) and 9 female subjects (4.5%). Bilateral absence of Palmaris Longus was in 4 male subjects (2%) while it was in 8 female subjects (4%).

Overall absence of Palmaris Longus was in 32 subjects (16%). Out of which it was absent unilaterally in 20 subjects (10%) and bilaterally in 12 subjects (6%).

Chi-square statics was 1.4139. P value was calculated 0.2344 which is not significant.

Table 2 shows that Palmaris Longus was absent on right side in 4 male subjects (2%) and in 5 female Subjects (2.5%). Palmaris Longus was absent on left side in 7 male subjects (3.5%) and in 4 female subjects

Table 1: Presence and absence of Palmaris Longus in both genders

	PL present in		PL absent in	
	Males	Females	Males	Females
U/L	181	175	11	9
B/L	85	83	4	8

Table 2: Unilateral absence of Palmaris Longusin both the genders

U/L absence	Male Subjects	Percentage %	Female Subjects	Percentage%	Overall Subjects	Percentage%	P value
RT	4	2	5	2.5	9	4.5	0.39073
Lt	7	3.5	4	2	11	5.5	

Table 3: Comparison of the unilateral and bilateral agenesis of Palmaris Longus muscle in living subjects

Sr. No.	Authors	Year	U/L A	B/L A	Remark
1.	Thompson et al	2001	16%	9%	U/L A>B/L A
2.	Sandeep et al	2006	3.30%	1.20%	U/L A>B/L A
3.	Roohi et al	2007	6.40%	2.90%	U/L A>B/L A
4.	Kapoor et al	2008	9.20%	8%	U/L A>B/L A
5.	Pawan Agarwal	2010	16.90%	3.30%	U/L A>B/L A
6.	L. A.Enye, et al	2010	8%	4.6%	U/L A>B/L A
7.	Mirela Eric et al	2010	21.6%	9.5%	U/L A>B/L A
8.	James W M Kigera et al	2011	3.3%	1.1%	U/L A>B/L A
9.	Faisal Nazeer Hussain	2012	16.7%	7.75%	U/L A>B/L A
10.	D K Sharma	2012	10%	6.25%	U/L A>B/L A
11.	Sangeeta et al	2013	6.5%	9.5%	B/L A>U/L A
12.	Deepti O Kulkarni et al	2014	15%	8.33%	U/L A>B/L A
13.	Present study	2014	10%	6%	U/L A>B/L A

Table 4: Comparison of the unilateral agenesis of Palmaris Longus muscle in living subjects

Sr. No.	Authors	Year	Rt A %	Lt A %	REMARK
1	Reimann et al	1994	4.7%	3.6%	Rt A >Lt A
2	Sandeep et al	2006	1.7%M	0.8%M	Lt A>Rt A
			0.5%F	3.3%F	
3	Kapoor et al	2008	3%	6.2%	Lt A>Rt A
4	Godwin O Mbaka	2009	2.4%	3.4%	Lt A>Rt A
5	Mirela Eric et al	2010	8.6%	13%	Lt A>Rt A
6	Pawan Agarwal	2010	7.17%M	12.30%M	Lt A>Rt A
			4.21%F	10%F	
7	James W M Kigera et al	2011	1%	2.6%	Lt A>Rt A
8	D K Sharma	2012	5.25%	4.75%	Rt A >Lt A
9	FarivarAbdolahzadehLahiji	2013	10.2%	5.9%	Rt A >Lt A
10	Deepti O Kulkarni et al	2014	5.5%	6%	Lt A>Rt A
11	Present study	2014	4.5%	5.5%	Lt A>Rt A

(2%). Palmaris Longus was absent on right side in 4 male subjects (2%) and in 5 female subjects (2.5%).

Chi-square statics was 0.7367. P value was calculated 0.39073 which is not significant.

Discussion

Palmaris Longus is a small vestigial muscle which is phylogenetically retrogressive muscle. It has short belly and long tendon. Palmaris Longus may be absent in 15% individuals. It is the most desirable tendon in reconstructive surgery. It is also the first choice donor tendon as it fulfills the necessary requirements of length, diameter and availability and can be used without producing any functional deformity.

In carpal tunnel syndrome or arthritis, identification of palmarislongus tendon is useful during administration of drugs to relieve pain & median nerve wrist block. The most common variation found is agenesis of palmarislongus muscle. Its absence means losing potential site for reconstructive surgeries. Schaeffers test was first to be used and considered as a standard test. But it is difficult to demonstrate the tendon by this test then combinations

of tests were found to be useful. As palmarislongus is a wrist flexor, tensor of palmar aponeurosis and abductor of thumb (as sends slip to abductor pollicis brevis), test which help in wrist and finger flexion, thumb abduction and apposition help to make the tendon of palmarislongus prominent.

We compared our findings with the previous studies.

In the present study we found unilateral agenesis of Palmaris Longus more common than bilateral agenesis. Our findings correlated with all the authors except Sangeeta et al who found bilateral absence to be more than unilateral.

Findings of the unilateral and bilateral agenesis of Palmaris Longus muscle in living subjects of our study were similar to the authors in Table 3.

Table 4 shows that in the present study we found unilateral agenesis of Palmaris Longus to be more common on left side than on right side.

The findings of Reimann et al, DK Sharma and FarivarAbdolazadeh Lahiji did not correlate with the present study.

Table 5 shows that in the present study agenesis of Palmaris Longus was more common in female than in male subjects and these findings

Table 5: Comparison of agenesis Palmaris Longus muscle in both the genders

Sr. No.	Authors	Year	Male	Female	Remark
1	Sandeep et al	2006	4.2	4.8	F>M
2	Roohi et al	2007	5.8%U/L 1.3%B/L	7.1%U/L 4.4%B/L	F>M
3	L. A.Envy, et al	2010	9.5%	13.95%	F>M
4	Pawan Agarwal	2010	19.48%U/L 5.12% B/L	14.21%U/L 1.6%B/L	M>F
5	James W M Kigera et al	2011	4.9%	3.9%	M>F
6	D K Sharma	2012	8.5%	7.75%	M>F
7	Osonuga	2012	1.3%	1.8%	F>M
8	Deepti O Kulkarni et al	2014	10.53%	19%	F>M
9	Present study	2014	7.5%	8.5%	F>M

correlated with the findings of Sandeep et al, Roohi et al, LA Envy et al, Osonuga and Deepti Kulkarni et al. Pawan Agrawal, James WM Kigera et al and DK Sharma found agenesis of palmarislongus more common in male than in female subjects.

Conclusion

Absence of palmarislongus is more common in female and unilateral absence is more than bilateral. There was no stastical association between absence of palmaris longus & gender, body sides. Knowledge

about the frequency of its absence and the most effective test for detecting its absence may be highly relevant in preoperative work up when surgical intervention involving forearm or specially tendon transfer is being considered.

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