

Frequency Of Agenesis Of The Palmaris Longus Muscle In Nigerians

S Oladipo Gabriel, C Didia Blessing, A Ugboma

Citation

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Abstract

This study was carried out to document the percentages of palmaris longus muscle amongst Nigeria for anthropological purposes. Three thousand (3,000) Nigerian subjects comprising 6000 extremities out of which 1932 (3864 extremities) were males and 1068 (2136 extremities) were females were inspected for the frequency of agenesis (absence) of the palmaris longus muscles. The presence or absence of palmaris longus was determined by physical examination of the palmaris longus tendon at the wrists of both hands. The muscle was made visible by opposing the thumb on the little finger and slightly flexing the wrist joint (in vivo examination). The frequency of agenesis of this muscle based on sex, side of the body and the overall incidence were determined. From the study, the muscle was found to be absent in 0.16% of the males on the right side and 0.19% of the females on the right side. On the left side, it was absent in 0.21% of males and 0.09% of females. On the average, percentage of agenesis was 0.18% in males and 0.14% in females. Thus the percentage was higher in males than females. The overall percentage of agenesis in Nigerians was 0.17%. This percentage is much lower than other populations. Bilateral absence was found in one male subject. There was no case of bilateral agenesis in females. The result is also reliable for anthropological studies involving Nigerians. It could be a useful guide to clinicians who may want to localize the median nerve amongst Nigerians. The tendon can still be counted on by surgeons treating Nigerian patients for use as a donor tendon, which will be present in a vast majority of Nigerian patients.

INTRODUCTION

Palmaris longus has long been described as the most variable muscle in the human body ¹. This small fusiform muscle is absent on one or both sides (usually the left) in approximately 14% of people ², its incidence varies amongst different people ³.

The palmaris longus tendon is a useful guide to the median nerve at the wrist. The tendon lies deep and slightly medial to this nerve before it passes deep to the flexor retinaculum ². To test the muscle, the wrist is flexed and the pads of the little finger and thumb are pinched together. If present, the tendon can be easily seen and palpated ²⁴⁵.

Previous studies showed differences in incidence of the muscle among different races [[[3.]]] Amongst Ugandans, the incidence of agenesis of palmaris longus has been reported to be 1.02% ⁶, amongst Zimbabweans and Congolese, the incidences are 1.5% and 3.0% respectively ⁷. In Turks it has been reported to be 26.6% ⁸. Amongst Indians the incidence is 17.2% ⁹. In a similar study carried out on Americans, percentage of agenesis was found to be 12.8% ¹⁰.

. A high value of 20.4% was also reported for Germans ¹¹. For the Japanese and Chinese, the incidences were reported as 3.4% ¹² and 2.2% respectively ¹³.

In Nigeria, a group of researchers ¹⁴ reported the incidence of agenesis of palmaris longus in the Edo tribe of Nigeria, based on sex and side of the body. They worked on a sample of 400 students which comprised 180 females and 220 males and found the incidence to be 1.25% for the limb, 1.0% for the right, 0.5% for females, 1.59% for males and 1.13% for the overall population. Conversely, previous works indicate a higher incidence value for whites than blacks and males than females. The Yorubas were said to have incidence of 6.7% ¹⁵.

The objective of the present investigation was to present a useful data on the frequency of agenesis (absence) of palmaris longus on Nigerian population as a whole.

MATERIALS AND METHODS

The study was carried out on an open populace who were Nigerians by both parents and grand parents (children were excluded). They were randomly selected across the

geopolitical zones of Nigeria. A total of 3000 Nigerians (6000 extremities) were inspected. One thousand nine hundred and thirty-two (1,932) were males (i.e. 3864 extremities), one thousand and sixty – eight (1,068) were females (i.e. 2136 extremities). The palmaris longus tendon was made visible by opposing the thumb on the little finger and slightly flexing the wrist (in vivo examination) ²⁴⁵ . (figure 1).

Figure 1

Figure 1: Palmaris longus made visible by opposing the thumb and little finger and slightly flexing the wrist.



RESULTS

The data obtained in this investigation are presented in table1–3. Incidence (frequency) of agenesis of palmaris longus is recorded in table 1. The values for both sexes and both sides of the hands are shown in the table. The value for the right side in males was 3 while it was 2 for the right side in females. On the left side, incidence of agenesis was 4 in males and 1 in females. The total incidence in males and females were 7 and 3 respectively. In the overall population (male and female), the value was 10. Females did not show bilateral agenesis while there was a case of bilateral agenesis in male.

Table 2 represents the calculated percentages of agenesis of palmaris longus in both sexes in right and left hands. The percentages in the right hands of the males and females were 0.16% and 0.19% respectively. The percentages in the left hands of males and females were 0.21% and 0.09% respectively. The overall percentage in Nigerians was

0.17%.

Table 3 represents the comparison of the overall percentages in total population of males and females in both hands in different populations. From the table, Germans had the highest percentage of agenesis (19.4%) followed by Americans (12.8%), Japanese (3.4%), Chinese (2.2%) Edo Tribe of Nigeria (1.13%), Ugandans (1.02%). Nigerians (present study) had the lowest percentage of 0.17%.

Figure 2

Table 1: Incidence of Agenesis of the palmaris longus muscle in Nigerians.

Sex	Sample Size (n)	Incidence of Agenesis		Total
		Right hand	Left hand	
Male	1932	3	4	7
Female	1068	2	1	3
Overall population	3000	5	5	10
Total no of extremities	6000	10		10

Bilateral agenesis in male = 1

Bilateral agenesis in female = 0

Figure 3

Table 2: Percentage of Agenesis of the palmaris Longus Muscle in Nigerians.

Sex	Samples Size (n)	Percentage of Agenesis (%)		
		Right hand	Left hand	Total
Male	1932	0.16	0.21	0.18
Female	1068	0.19	0.09	0.14
Overall population	3000	0.17	0.17	0.17

Total number of Extremities in male= 3864

Total number of extremities in female = 2136

Total number of extremities in overall population = 6000.

Figure 4

Table 3: Comparison of percentages of palmaris Longus agenesis in different populations.

Populations	Percentages of Agenesis (%)	
Americans	12.8	Remann et al ¹⁰
Congolese	3.0%	Gangata ⁷
Zimbabweans	1.5%	Gangata ⁷
Ugandans	1.02	Igbigbi and Ssekitoileko ⁶
Turkish	26.6%	Kose et al ⁸
Germans	20.4	Gruber ¹¹
Japanese	3.4	Adachis ¹²
Indians	17.2	Kapoor et al ⁹
Chinese	2.2	Nakano ¹³
Yorubas	6.7	Mbaka and Ejiwumi ¹⁵
Edo Tribe	1.13	Oyinbo et al ¹⁴

DISCUSSION

The frequency of agenesis of palmaris longus recorded in this present study is lower than those recorded for other populations of the world previously reported^{6,7,8,9,10,11,12,13,14,15}. The present study supports the findings of Igbigbi and Ssekitoileto⁶ and Remann et al¹⁰ who reported that agenesis was more in males than in females. This is, however, at variant with the findings of Thompson et al¹⁶ who reported higher percentage of agenesis of palmaris longus, in female Caucasians than in males. Unlike Oyinbo et al¹⁴ and Mbaka and Ejiwumi¹⁵ who reported 1.13% and 6.7% for agenesis of palmaris longus in Edo tribe and Yorubas respectively, our findings have shown that in Nigerian population, as a whole, palmaris longus is absent in 0.17% of the population. The larger percentage reported by the previous authors^{14,15} on Edo and Yoruba tribes might be due to a smaller sample size which does not seem to perfectly represent the Nigerian population.

CONCLUSION

Amongst Nigerians, palmaris longus is absent in 0.17% of the population and unilateral agenesis is more frequent. Since most Nigerians have palmaris longus muscle, it can be very useful in determining the exact location of the median nerve. The result is also reliable for anthropological studies involving Nigerians. It could be a useful guide to clinicians

who may want to localize the median nerve amongst Nigerians.

The tendon can still be counted on by surgeons treating Nigerian patients for use as a donor tendon, which will be present in a vast majority of Nigerian patients.

References

1. Williams PL; Bannister LH; Dyson M; Berry MM; Collins P; Dusset J.E; Fergusson MWJ. Gray's Anatomy In: The muscular system. 38th edition, Churchill Livingstone, London. 1995. Pp 846.
2. Keith LM; Arthur FD; Paul JK; Crystal T; Lisa SD; Karen R. Clinically oriented Anatomy. 4th Edition. Williams & Wilkins, Wolters Kluwer Co., New York. 1999. Pp 737.
3. Machado AB; Didio LJ. Frequency of the musculus palmaris longus studied in vivo in some Amazon Indians. American Journal of Physical Anthropology, 1967; 27. Pp 11 – 20.
4. Schaeffe, JP. On the variations of the palmaris muscle. Anatomical Records .1909.3. Pp 275 – 278.
5. McMinn RHM. Last's Anatomy Regional and Applied, 9th edition. Churchill Livingstone, 1998. Philadelphia. Pp.90.
6. Igbigbi PS; Ssekitoileko HA. Incidence of agenesis of the palmaris longus muscle in Ugandans. West African Journal of Anatomy 1998. 6: 21 – 23.
7. 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):230-35.
8. 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 Trauma Surg. 2009. 129(5):609-611.
9. Kapoor SK; Tiwari A; Kumar A; Bhatia R; Tantuway V; Kapoor S. Clinical relevance of palmaris longus agenesis: common aberration. Anat Sci. Int. 2008. 83(3):45-48.
10. Remann AF; Dasler FH; Anson BJ; Beaton LE. The palmaris longus muscle and tendon. A study of 1600 extremities. Anatomical Record. 1944. 89: 495 – 505.
11. Gruber W. Beobachten ans der menshlicher undvergleichendan Anatomic Berlin. Merories del 'Academic imperiale de st. peterburg. 1972. 11: 1-26.
12. Adachi B. Beitrage Zur Anatomic der Japaner. Die statistic der muskel variataben Zweite mitteiloung. Zeitsch folia morphologie der Anthropolgie. 1909. 12: 261 – 312.
13. Nanako T. beitrade Zur Anatomic der Chinesen. Die satistik der muskelvalet aten. Folia Anatomic der Japaner. 1923. 1: 273-282.
14. Oyinbo CA; Dare WN; Nwaopara AO; Anyanwu LC. The incidence of agenesis of palmaris longus muscle in the Edos of Nigeria. J. Expt & Clin. Anat. 2004. 3(1): 48-49.
15. Prevalence of palmaris longus absence- a study in the Yoruba population. Ulster Med. J. 2007.8(2):90-93.
16. Thompson JW; Mcbatts J; Dan Forth CH. Hereditary and racial variation in the musculus palmaris longus. American Journal of physical Anthropology. 1921. 4: 204-218.

Author Information

S. Oladipo Gabriel, MSc

Department of Anatomy, Faculty of Basic Medical Sciences, College of Health Sciences, University of Port Harcourt, Port Harcourt, Rivers State-Nigeria

C. Didia Blessing, MD

Department of Anatomy, Faculty of Basic Medical Sciences, College of Health Sciences, University of Port Harcourt, Port Harcourt, Rivers State-Nigeria

AA Henry Ugboma

Department of Obstetrics and Gynaecology Faculty of Clinical Sciences, College of Health Sciences, University of Port Harcourt, Port Harcourt, Rivers State-Nigeria