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# THE INCIDENCE OF THE ABSENCE OF PALMARIS LONGUS MUSCLE AMONG THE IJAWS OF BAYELSA EXTRACTION

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## ABSTRACT
**Aim:** This study aims to determine the prevalence of the absence of the Palmaris longus muscle and its association with gender among the Ijaws of Bayelsa State. **Subjects and Methods**: In the study, 300 subjects from Bayelsa state (162 females and 138 males) were randomly selected for physical examination of the Palmaris longus muscle. The anterior surface of the wrist was observed for the presence or absence of the Palmaris longus tendon following modified Schaeffer's test. **Result**: Only in 2 (0.7%) of the subjects, absence of the Palmaris longus tendon was observed (1 unilateral – right forearm and 1 bilateral). All the remaining 298 (99.3%) subjects demonstrated the presence of the Palmaris longus tendon. **Conclusion**: Despite the frequent report of the high prevalence of the absence of the Palmaris longus muscle, Black African populations appear to have lower rates of the absence of the muscle. This was also shown by the current study which demonstrated a near absence of the agenesis of the muscle among the studied black population. Hence, the study concluded that the prevalence of the absence of the Palmaris longus muscle differs among the various countries.

**KEYWORDS**: Palmaris longus, Absence, Prevalence, Bayelsa State.

## INTRODUCTION
The palmaris longus muscle is among the superficial group of muscles located in the anterior compartment of the forearm.[1] It has a short belly with a long tendon; hence, it is often referred to as phylogenetically retrogressive muscle. It originates from the medial epicondyle of the humerus and is inserted with its long tendon to the flexor retinaculum (the palmar aponeurosis). It is situated between the flexor Carpi radialis and flexor Carpi ulnaris muscles. The muscle functions as an accessory flexor of the wrist. In addition, it is very useful in tendon grafting.

The palmaris longus muscle is one of the most variable muscles in the body.[2] Anatomically, it has been reported that the palmaris longus muscle is absent in about fifteen percent (15%) of the whole world population,[3,4] However, this prevalence rate is said to vary tremendously among the various countries.[5,6] For example, in Iran, an incidence of 30.7% of agenesis of this muscle was reported;[7] a prevalence of 1.5% was reported for Zimbabwe.[8] The percentage of absence of this muscle in Nigeria was reported to be 6.7%[9] and in China, 4.6 % of agenesis of the muscle was reported,[10] The percentage of absence reported for North American Caucasians is 5.5%.[11] In Egypt, the percentage absence was found to be very high - 50.8%.[12]

The association of the absence of the Palmaris longus muscle and gender has been reported to be unequivocal. While some authors reported predominance of the agenesis in females,[13,14,15] Others failed to find any significant difference between the two sexes.[9,10,16] However, the percentage for the absence of the Palmaris longus muscle has not been reported for the Bayelsan population, hence the need for this study. This study aims to determine the prevalence of the absence of Palmaris longus muscle and its association with gender among the Ijaws of Bayelsa State.

## SUBJECTS AND METHODS
In this study, a total of 434 subjects were randomly selected for physical examination of the Palmaris longus muscle. Out of the above number, 300 were Bayelsans. Of the 300 Bayelsans examined, 288 (162 females and 126 males) were students from the Niger Delta university with ages ranging between 16 years and 40 years, while 12 subjects (all men) were non-students and age ranging between 6 years and 55 years. All the non - Bayesans were excluded. Persons with significant history of injury or abnormality of the upper limbs were also excluded.

The anterior surface of the wrist was observed for the presence or absence of Palmaris longus tendon while the thumb was opposed to the little digit and the wrist flexed

and slightly pronated (modified Schaeffer's test,[6] figure 1). See the pictures below. Individuals in whom the above procedure fails to demonstrate the presence of the Palmaris longus tendon were considered absent. Recordings were made for both the right and left upper limbs.

**Figure 1. Modified Schaeffer's test. In the Schaeffer's test, thumb was opposed to the little digit and the wrist flexed. By slightly pronating the forearm in the Schaeffer's test, the tendon of the palmaris longus (red arrow) becomes tauter. This eliminates false absence palmaris longus during testing.**

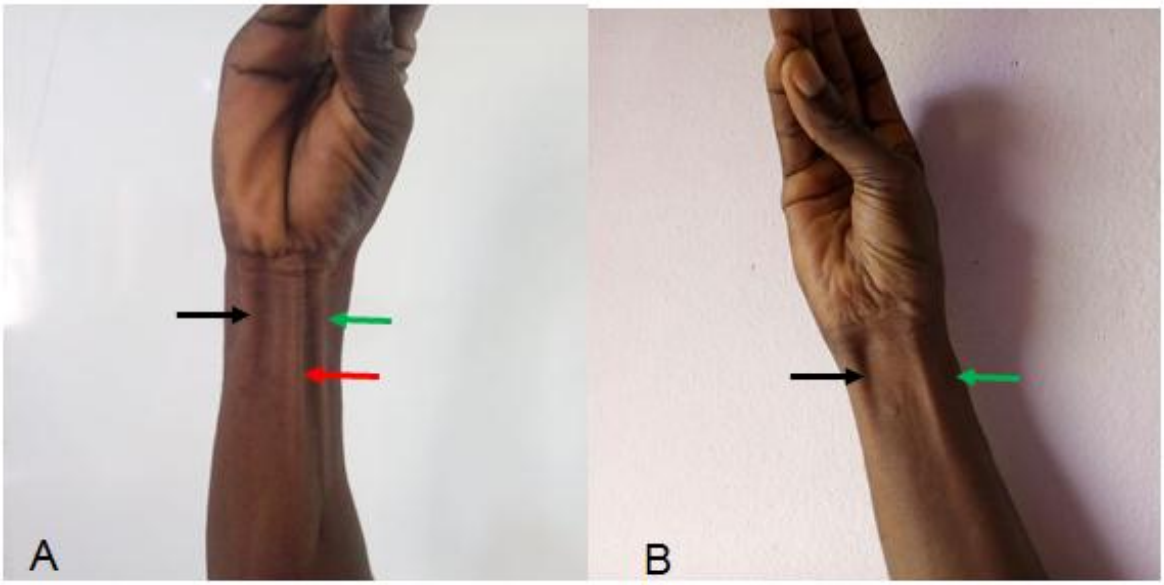


**Figure 2: Panels A and B shows the flexor compartment of the forearm. Note the muscles of the superficial layer of the flexor compartment of the forearm showing flexor carpi ulnaris (black arrow), palmaris longus (red arrow) and flexor carpi radialis (green arrow). Note the absence of palmaris longus in panel B.**

**RESULT**

Out of the 300 subjects included in the study, 162 (54%) were females and 138 (46%) were males. The Palmaris longus tendon was found bilaterally in 298 (99.3%) of all the subjects examined and only in 2 (0.7%) of the subjects, the tendon was absent (1 unilateral - right forearm and 1 bilateral). The subject with the unilateral absence of the muscle was a female, while the one with bilateral absence was a male (tables 1).

**Table 1: Overall distribution of the Palmaris longus muscle's absence or presence in both sexes.**

| SEX | PRESENT | ABSENT | | TOTAL |
|---|---|---|---|---|
| | | RIGHT | LEFT | |
| MALE | 137 | 1 | 1 | 138 |
| FEMALE | 161 | 1 | 0 | 162 |

## DISCUSSION

The Palmaris longus muscle has been studied extensively by many researchers. Its variability has also been reported widely. Many studies indicated high frequency of the absence of the Palmaris longus muscle.[7,12] While other authors reported lower rates of the absence of the Palmaris longus.[8,13,17]

In the current study, the result indicated that the prevalence of the absence of the Palmaris longus muscle is very minimal among the subjects included in the study. Only in 2 (0.7%) of the subjects, the absence of the muscle was observed (1 bilateral and 1 unilateral). The remaining 298 (99.3%) of the subjects examined demonstrated presence of the muscle. This is clearly a departure of previous reports in other studies which indicated moderate to high rates of the absence of the Palmaris longus muscle.[12,14,15] The study however, corroborated with other studies in African populations which indicated that the prevalence of the agenesis of the Palmaris longus muscle is relatively low in the black African populations.[8,13]

The association of the prevalence of the absence of the Palmaris longus muscle with sex has been reported in many studies. While some studies indicated that the agenesis of the muscle is more common in females,[12,13,14] others failed to demonstrate any significant statistical difference among the two sexes.[9,10,18] Even though in the current study, the 2 subjects found to have the absence of the muscle were from both sexes (1 male with bilateral absence and 1 female with unilateral absence), the number is too small to lend a support to those studies which reported that the agenesis of the muscle shows no significance statistical difference between the two sexes. The findings in this study demonstrated that the agenesis of the Palmaris longus muscle is minimal among the Ijaws of the Bayelsa extraction.

## CONCLUSION

Despite the frequent report of the high prevalence of the absence of the Palmaris longus muscle, Black African populations appear to have lower rates of the absence of the muscle. Hence, the study concluded that the prevalence of the absence of the Palmaris longus muscle differs among the various countries.

## REFERENCES


1. McMinn RMH, 1998. Last's Anatomy, Regional and Applied, 9th edition, Churchill Livingstone, Philadelphia, P. 89
2. Brones MF. Anatomical variations of the Palmaris longus, causing Carpal tunnel syndrome, case report, plastic reconstructive surgery, 1978; 62: 798 – 800.
3. Kapoor SK, iwari A, Kumar A, Bhatia R, Tantuway V, Kapoor S. Clinical relevance of Palmaris longus agenesis: Common anatomical aberration. Anat Sci Int, 2008; 83: 45 – 48.
4. Richard LD, Wayne Vogle A, Adam WMM. Anatomy for students, 3rd edition. Elsevier, Churchill Livingstone, 2014; p.776 – 7.
5. Dimitriou Loannis, Katsourakis Anastasios, Natsis Konstantinos, Kostrtzis Lazaros and Nausios Georgios. Palmaris longus muscle's prevalence in Different Nations and Interesting Anatomica Variations: review of the Literature. J Clin Med Res, 2015; 7: 825 – 830.
6. Schaefer JP. On the Variations of the Palmaris longus muscle (abstract). Anatomical records, 1909; 3: 275 – 278.
7. Karimi JH, Rahmanian K, Jahromi AS. Relation of Palmaris longus agenesis with hand dominance. Life Science Journal, 2014; 11: 2.
8. Gangata H. The Clinical Surface anatomy anomalies of the Palmaris longus muscle in Black African population of Zimbabwe and proposed new testing technique. Clin Anat, 2009; 22: 230 – 235.
9. Mbaka GO and Ejiwunmi AB. Prevalence of Palmaris longus absence – a study in the Yoruba population. Ulster Med J, 2009; 78: 90 – 93.
10. Sebastin SJ, Lim AY, Bee WH, Wong TC, Methyl BV. Does the absence of the Palmaris longus affect grip and pinch strength? J Hand Surg Br, 2005; 30: 406 – 408.
11. Troha F, Baibak GJ, Kelleher JC. Frequency of the Palmaris longus tendon in North American Caucasians. Ann Plast Surg, 1990; 25: 477 – 478.
12. Raouf HA, Kader GA, Jaradat A, Dharap A, Fadel R, Salem AH. Frequency of Palmaris longus absence and its association with other anatomical variations in Egyptian population. Clin Anat, 2013; 26: 572 – 577.
13. Osonuga A, Mahama HM, Brown AA, Osonuga OA, Serbeh G, Harding AN, Homeku AK. The prevalence of Palmaris longus agenesis among the Ghanian population. Asian journalof Tropical Disease, 2012; 2: 887 – 889.
14. Kose O, Adanir O, Cirpar M, Kurku M, Komurcu M. Prevalence of absence of the Palmaris longus: a study in Turkish population. Arch orthop Truama surg, 2009; 129: 609 – 611.
15. Sater MS, Dharap AS, Abu-Hijleh MF. The prevalence of the absence of the Palmaris longus muscle in the Bahraini population. Clin Anat, 2010; 23: 956 – 961.
16. Oyinbo CA, Dare WN, Nwaopara AO, Anyanwu LC. The incidence of agenesis of the Palmaris

Longus muscle in the Edos of Nigeria. Journal of Experimental and Clinical Anatomy, 2004; 3(1): 48-9.

17. Enye La, Saalu LC, Osinubi AA. The prevalence of Palmaris longus muscle among students in two Lagos – Based Medical schools. Int J Morphol, 2010; 28: 849 – 854.