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Research Article

Absence of Palmaris Longus in Medical Students of Karachi

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Abstract

Introduction: Palmaris Longus is a phylogenetically retrogressive muscle i.e. a short belly and long tendon. Situated in the anterior region of the forearm. This muscle has served orthopedic, cosmetic and reconstructive surgery since decades. Its superficial location makes it a common donor.

Method: cross sectional study done among the students of Karachi medical and dental college. Five tests were used to check the presence or absence of Palmaris Longus muscle

Results: Unilateral absence of Palmaris Longus muscle was found in 6.79% of individuals while bilateral absence was found in 3.49% of individuals.

Absence of Palmaris Longus on the right was found in 5.04 % (26) individuals Absence of Palmaris Longus of the left was found in 5.24% (27) individuals.

Discussion: Individuals with bilateral or unilateral absence of Palmaris Longus show no functional deficits which confirm the fact that the significance of Palmaris Longus lies in orthopedic and reconstructive surgeries.

Keywords: Palmaris longus; Karachi; Medical students

Introduction

The first choice for tendon autograph is surgery [1]. The muscle used to suspend frontal is for correcting congenital ptosis [2], the muscle which is used to make tendon ball implant to replace collapsed lunate [3], muscle which along with its tendon is used in lip augmentation [4], for replacing ruptured extensor tendons in rheumatoid hands [5], for repair of loss of tendoachilles [6], for management of facial paralysis is, Palmaris Longus muscle. This muscle has served orthopedic, cosmetic and reconstructive surgery since decades [7]. Its superficial location makes it a common donor [8].

Palmaris Longus is a phylogenetically retrogressive muscle i.e. a short belly and long tendon [9]. It is situated in the anterior region of the forearm covered with a fascia it originates from the common flexor origin around medial epicondyle while inserts into the palmar aponeurosis. It is weak flexor of wrist and tensor of palmar aponeurosis. It can also help in thumb abduction [10]. These activities are used in opening up of scissors, typing with the keyboard, playing musical instruments etc. [11]. Various anomalies have been reported with Palmaris longus muscle like double tendon, tendinous split, incomplete or anomalous insertions [12]. It is seen that with the evolution of mankind Palmaris longus is regressing. It is said by some authors that palmar aponeurosis is replacing Palmaris longus [13]. When regressed or surgically excised the functions of this muscle are taken up by plantaris, tibia muscles, extensor digitorum, extensor digiti minimi, patellar tendon and gracalis and semitendinosus muscles [14].

Studies suggest 15% absence of Palmaris longus muscle worldwide but absence vary population to population [15,16]. According to some authors unilateral absence is more common in the non-dominant hand due to less usage and is more common in females [17]. Some studies report that absence of Palmaris longus is associated with other anatomical anomalies like anomalous superficial arch, absence of plantaris [16,18].

Method

This is a cross sectional study done among the students of Karachi medical and dental college. Data was collected from 515 individuals doing probability sampling. Students having injuries in any of their arms or with any past medical or surgical history were excluded. The conduct of study was explained and informed consent was taken. Data was collected by designated technician. Hand dominance was recorded. Five tests were used to check the presence or absence of Palmaris longus muscle.in Thompsons's, the subject is asked to make a fist, then flex the wrist and finally the thumb is opposed and flexed over the fingers [18]. In Schaeffer's test the subject is asked to oppose the thumb to the little finger and then flex the wrist [19].

In pushpa Kumar's test, the subject is asked to fully extend the index and middle finger, the wrist and other fingers are flexed and finally the thumb is fully opposed and flexed [20]. In Mishra's test I, the metacarpo- phalangeal joints of all fingers are passively hyperextended by the examiner and the subject is asked to actively flex the wrist. In Mishra's test II the subject is asked to abduct the thumb against resistance with the wrist in slight palmar flexion [21]. The wrists were palpated during each of these tests to ensure the accuracy of these tests (Figure 1).

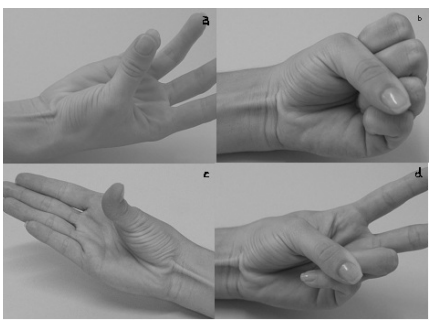

Figure 1: Image showing different tests used for visualize or palpable the Palmaris Longus tendon. In a) Schaffer's test, in b) Thompson's test, in c) Mishra's test II, in d) Pushpakumar's method.

When all of these tests were found to be negative then this was taken as absence of palmsris longus while positive results of any one of these tests was taken as presence of Palmaris longus. Data was analyzed using SPSS version 20.0.

Results

Of 515 individuals, 153 were males while 358 were females. Of them between ages 18-20 were 268 individuals (80 males, 188 females), 21-23 were 227 (69 males, 158 females), 24-27 were 15 (4 males, 11 females).

Right handed individuals were 90.8% (468) while left handed individuals were 9.12% (47).

Unilateral absence of Palmaris longus muscle was found in 6.79% of individuals while bilateral absence was found in 3.49% of individuals.

Absence of Palmaris longus on the right was found in 5.04% [26] individuals of whom 5 were males and 21 females. 88.4% of these were right handed while 11.1% were left handed.

Absence of Palmaris longus of the left was found in 5.24% [27] individuals (5 males, 22 females). 77.7% were right handed while 11.1% were left handed.

Discussion

Individuals with bilateral or unilateral absence of Palmaris longus show no functional deficits which confirm the fact that the significance of Palmaris longus lies in orthopedic and reconstructive surgeries [22]. Absence of Palmaris longus differs among populations and ethnic groups [18]. It is found to be 1.02% in Ugnadan, 3.4% in Japanese population, 4.6% in Chinese population, 6.7% among Nigerians, 14% in Brazil, 20.2% among Indians, 24% among North Americans, 26.6% in Turkish population, 38.6% among Bahrain population [23]. Our study shows bilateral absence of 3.49% which is very close to Japanese population. African populations also suggest lower rate of absence in them and they provide the reason for this lower rate a high prevalence of manual labor. Labor involves increased wrist motion, strong grip which then brings Palmaris into action and decreases its chances for regression [17]. Being a third world country majority of our population is involved in labor and this accounts for lower rate of agenesis of Palmaris longus. The limitation of this study is relatively greater number of females due to which it cannot be calculated whether the absence is more common in males or females. Some studies suggest that bilateral absence is more common in females [17]. However few studies report that there is no statistical correlation between absence of Palmaris longus and gender [9,18]. Mishra's test was found to be most helpful in detecting absence of Palmaris longus which is also true a/c to another study held among Chinese population

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