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Absence of the palmaris longus muscle: a population study

N W Thompson, B J Mockford, G W Cran

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SUMMARY

We examined 300 Caucasian subjects (150 males, 150 females) aged 18-40 years to assess the incidence of palmaris longus absence. The presence or absence of palmaris longus was assessed by clinical inspection.
Forty-nine subjects had unilateral absence of palmaris longus (16%). The tendon was absent bilaterally in 26 subjects (9%).
Unilateral and bilateral absence was more common in males, however this was not statistically significant (p= 0.25 and 0.56 respectively).
In those subjects with unilateral absence, the right side was found to be more commonly affected however no statistical significance was evident (p= 0.25).

INTRODUCTION

It is well known that individuals may have unilateral or bilateral absence of palmaris longus, a structure often used in reconstructive plastic surgery mainly in the setting of tendon grafting, although it has also been used for a wide variety of procedures including lip augmentation,[1] ptosis correction[2,3] and in the management of facial paralysis.[4]

The aim of this study was to determine the incidence of unilateral and bilateral absence of palmaris longus for the Caucasian population of Northern Ireland.

PATIENTS AND METHODS

For the purpose of this study, 300 Caucasian subjects (150 males, 150 females) aged between 18 and 40 years, were randomly selected by the principal author and examined. Individuals with a history of injury or abnormality of the upper extremities were excluded. Hand dominance was recorded for each subject.

The examination entailed observation of the volar aspect of the wrist, looking for the palmaris longus tendon in its usual anatomical position just ulnar to the flexor carpi radialis tendon. If the tendon was not visible, the patient was asked to oppose his or her thumb to the little finger and flex at the wrist (Figure 1). If all of the above

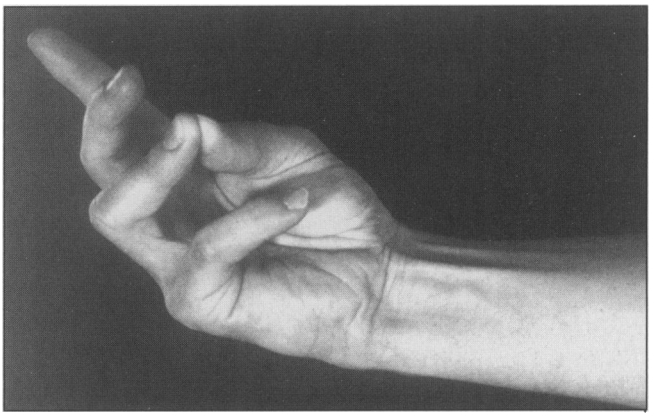

Fig 1. Subject demonstrating the presence of palmaris longus on clinical testing.

Department of Plastic and Maxillofacial Surgery, Ulster Hospital, Dundonald, 700 Upper Newtownards Road, Belfast BT16 0RH.

Neville W Thompson, MB, MRCS(Edin), Senior House Officer in Plastic Surgery.

Brian J Mockford, MB, BCh, BAO, Senior House Officer in Plastic Surgery.

Department of Epidemiology and Public Health, Queen's University of Belfast, Mulhouse Building, Institute of Clinical Science, Grosvenor Road, Belfast BT12 6BJ.

Correspondence to Mr Neville W Thompson, 1 Steeple Green, Antrim, County Antrim, Northern Ireland BT41 1BP. (Tel: 02894 462824; e-mail:nthompson@doctors.org.uk).

failed to demonstrate a palmaris longus tendon, it was considered absent (Figure 2). The presence or absence of the palmaris longus tendon was recorded for both sides. Relationships between tendon absence, hand dominance and gender were analysed using the Chi-squared goodness-of-fit test.

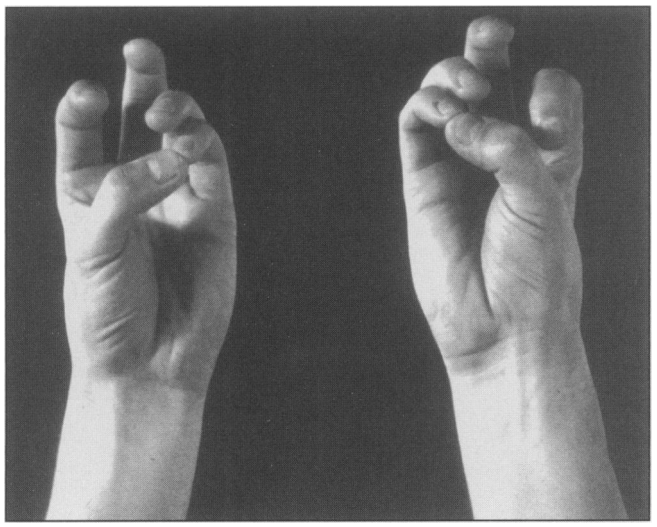

Fig 2. Subject demonstrating unilateral absence of palmaris longus (left).

RESULTS

Of the study population, twenty-one subjects were left-hand dominant (7%). Average age was 29 years (range, 18-40 years).

Twenty-six subjects (9%) were found to have bilateral absence of the palmaris longus tendon (95% CI, 5-12%). Forty-nine subjects (16%) had a unilateral absence of the tendon (95% CI, 12-20%). Of this group, the tendon was absent on the right side in 29 subjects. Twenty subjects had absence of the tendon on the left. Of the subjects with bilateral absence of palmaris longus, 15 were male and 11 female. Of those with unilateral absence, 29 male subjects and 20 female subjects were affected (Table 1).

TABLE I

Results after clinical evaluation of 300 subjects for the presence or absence of palmaris longus.

Tendon absence	*Males*	*Females*	*Right* side	*Left* side
Unilateral	29	20	29	20
Bilateral	15	11	#	#

DISCUSSION

Tendon grafts are frequently needed in reconstructive surgery on the hand. Many surgeons agree that the palmaris longus tendon is the first choice as a donor tendon because it fulfils the necessary requirements of length, diameter and availability, and can be used without producing any functional deformity.[5] The palmaris longus tendon is often considered the ideal donor for tendon grafts for replacement of the long flexors of the fingers, and of the flexor pollicis longus tendon.[6]

Palmaris longus is often described as one of the most variable muscles in the human body and is classified as a phylogenetically retrogressive muscle i.e. a short belly with a long tendon.[7] In vertebrates it is found only in mammals and is best developed in those where the forelimb is used for ambulation.[8] For example, the palmaris longus is always present in the orangutan [9] but is variably absent in higher apes such as chimpanzees and gorillas.[8] In humans the absence of palmaris longus appears to be hereditary but its genetic transmission is not clear.[9]

From the results of numerous previous studies investigating the incidence of palmaris longus absence it has been reported that bilateral absence occurs in 8% to 16% of individuals, with unilateral absence occurring in 4% to 14%.[8] Our figures compare favourably (bilateral absence, 9%; unilateral absence, 16%), and like most of the previous studies, reflects the incidence of palmaris longus absence in Caucasian individuals.[8,9] Racial variations are however well recognised.[5,9]

Previous studies have conflicted with regard to the incidence of palmaris longus absence in relation to gender and body side.[9-11] In our study, males were found to have a higher incidence of both bilateral and unilateral absence of palmaris longus, however this was not statistically significant (p= 0.56 and 0.25 respectively).

Furthermore, although the right side was affected more commonly in unilateral absence this also did not prove to be statistically significant (p= 0.25). In summary, the palmaris longus tendon is often regarded as the ideal tendon donor. Clinical testing revealed an incidence of unilateral absence of 16% and a bilateral absence of 9% in the Northern Ireland population. No statistically significant correlation was found between tendon absence and gender or body side.

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