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EFFICIENCY OF DIFFERENT TESTS IN REVILING THE PALMARIS LONGUS MUSCLE DURING THE STUDY OF ITS AGENESIS

Agenesis of Palmaris longus muscle is widely studied all over the world, and in recent years the frequency of researches and studies related to Palmaris longus muscle agenesis rapidly increased. During the studies of Palmaris longus muscle different tests were applied by different authors. The aim of this study was to estimate the efficiency of most commonly used tests during the study of Palmaris longus muscle agenesis in population of Hungarian ethnic origin.

Keywords: Palmaris longus muscle, tests, Thompson's test, Pushpakumar's test, two-finger sign method, Standard test, Schaeffer's test, Mishra's test I, Mishra's test II, agenesis.

Introduction: the Palmaris longus (PLM) muscle is one of the superficial slender muscles of the forearm that acts on the skin and distal digital webs. It is a phylogenetically degenerate muscle, and it functions as a metacarpophalangeal joint flexor [1]. During its phylogenetic degeneration the PLM lost its importance, and its functioning became unnecessary for the proper function of human hand. Probably this is one of the main causes of its great variability and frequent absence because even without it the human palm can function perfectly.

According to the studies done up to date it is believed that agencies of this muscle is phylogenetically retrogressive and will gradually lose its function totally [2].

It can be stated that the PLM is one of the most variable muscles in the human body, and its agenesis is apparently considered the most frequent anatomical variation [3].

Many authors suggest that there is a relation between the prevalence of frequency of the PLM agenesis in the subjects and the affiliation of the subjects to different ethnic groups [4].

The Palmaris longus muscle is a key importance muscle in reconstructive surgery since its tendon is considered to be a dispensable tendon and its absence does not significantly affect the function of the wrist. It fulfills the necessary requirements of length, diameter and availability, and can be used without producing any functional

deformity in reconstruction surgery [5]. It is therefore very useful in orthopaedics, hand and reconstructive surgery. It is commonly used by hand surgeons for tendon transfers [6], second stage tendon reconstruction, pulley reconstruction as well as tendon grafting. [7] Plastic surgeons also utilize the Palmaris longus muscle in restoration of lip and chin defects [8], lip and commissure reconstruction [9], ptosis correction [10, 11], and in the management of facial paralysis [12].

Differences in prevalence of PLM absence can be observed in different populations in relevant literature dealing with this topic.

Materials and methods: 1839 subjects of Hungarian ethnic origin were studied. During the research five most commonly used tests found in literature were applied, namely:

1. Thompson's test: The subject is asked to make a fist, then flex the wrist and finally the thumb is opposed and flexed over the fingers [13].

2. Standard test (Schaeffer's test): The subject is asked to oppose the thumb to the little finger and then flex the wrist [14].

3. Pushpakumar's test (two-finger sign method): 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 [15].

4. Mishra's test I: The metacarpophalangeal joints of all fingers are passively hyperextended by the

examiner and the subject is asked to actively flex the wrist [16].

5. Mishra's test II: The subject is asked to abduct the thumb against resistance with the wrist in slight palmar flexion [16].

6. Palpation: the wrists of every subject were examined by using the sense of touch (palpation) during each of five previous tests, to insure the trustworthiness of results. The results acquired through the palpation were considered as the results of maximal accuracy.

The sample of 1839 examined subjects means that the tests were applied on 3678 extremities.

The testing was performed in the following way: voluntary subjects were asked to perform the mentioned above tests to confirm or refute the presence of PLM. During each test palpation also was applied to ensure the correct results. Using palpation during each test was necessary because of obesity of some subjects. This made impossible to see the Palmaris longus muscle during all the tests, though it was present. Although during the tests many cases were observed, when PLM was absent, Flexor carpi radialis, or tendons of Flexor digitorum superficialis were manifested in a way they could have been easily mistaken with Palmaris longus muscle if not for the palpation.

Results: the applied tests revealed the presence of Palmaris longus muscle on examined extremities in the

following numbers:

- Thompson's test revealed the Palmaris longus muscle on 2150 extremities.

- Standard test (Scaeffler's test) revealed the Palmaris longus muscle on 2285 extremities.

- Pushpakumar's test (two-finger sign method) revealed the Palmaris longus muscle on 2179 extremities.

- Mishra's test I revealed the Palmaris longus muscle on 2480 extremities.

- Mishra's test II revealed the Palmaris longus muscle on 2233 extremities.

- Palpation revealed the Palmaris longus muscle on 2576 extremities.

Considering the results acquired by palpation as results of maximal accuracy the Palmaris longus muscle was absent on 1102 extremities.

After comparing the results of different tests with the results of palpation we can see the effectiveness of different tests in percents:

- The effectiveness of Thompson's test was 83,46%.

- The effectiveness of Standard test (Scaeffler's test) was 88,70%.

- The effectiveness of Pushpakumar's test (two-finger sign method) was 84,59%.

- The effectiveness of Mishra's test I was 96,27%.

- The effectiveness of Mishra's test II was 86,68%.

Conclusion. According to results described above from the five applied tests in the examined sample of Hungarian ethnic origin the Mishra's test I showed the highest efficiency – 96,27%. This means, that the use of Mishra's test I is highly recommended while studying samples of population which have Hungarian ethnic origin. Off course it can not be stated that Mishra's test I will have the same high efficiency in any other population. So because of the shortage of similar results in populations of other ethnic origins it has to be considered that these results can be applied only for samples taken from Hungarian population.

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