

## MEDICAL SCIENCE

### Report of an unusual Palmaris longus anomaly case

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**Abstract:** The palmaris longus muscle (PLM) is described as a slender, fusiform, superficial muscle in the anterior compartment of the forearm. It is considered one of the most variable muscles in the human body. During a study of the PLM a case was detected where the standard visual and palpation based tests didn't make it possible to tell for certain whether the patient had the PLM or it was missing. The ultrasound examination revealed an enlarged PLM with a tendon running deeper than usual but still passing over retinaculum flexorum.

**Keywords:** *palmaris longus muscle, muscle variation, enlarged muscle, ultrasound examination.*

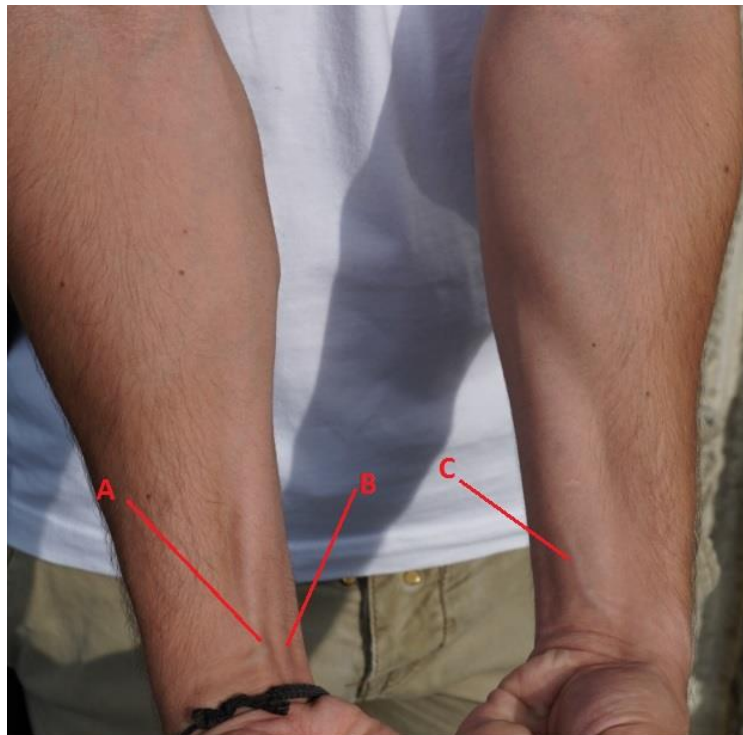
**Introduction.** The anatomic description of palmaris longus muscle (PLM) defines it as a slender, fusiform muscle that is found medial to the flexor carpi radialis muscle in the anterior compartment of the forearm. It is positioned superficially and the tendon of the muscle can be easily palpated. The PLM consists of a relatively short muscular belly and a long tendon. [8]

Some authors suggest that the PLM completely lost its function, and the presence or absence of the muscle has no effect on the functioning of the hand at all [4]. This might be the main cause of great variability of the PLM. The PLM is currently one of the most variable muscles in the human body, its described variations include: agenesis, the most frequent anatomical variation [16], reversed PLM [17], double PLM [11], variation in location [13], hypertrophy [3], and many others.

The human hand can function perfectly without this muscle and thus its absence or variation in shape and structure usually doesn't affect the proper function of the

hand [4]. This paper gives a report of an enlarged palmaris longus muscle, which was detected during a standard examination of the PLM agenesis rate.

**Case Report.** This case was detected during a standard examination of the PLM agenesis rate of students from University of West Hungary, Apáczai Csere János Faculty, Department of Sport Sciences. In a 21 year old healthy male patient the muscle pattern in the right and left hand shows a strong difference. While on the right hand the tendons, and partially the PLM and flexor carpi radialis muscles were easily recognisable, on the left hand it was impossible to distinguish the muscles, and the forearm of the patient showed only a strong protrusion instead of two tendons (**Fig 1.**). To determine if the patient has the PLM in his left hand, the tests, generally used in literature for PLM examination were performed. Namely: Thompson's [21], Schaeffer's [18], Pushpakumar's [14], Mishra's 1, Mishra's 2 [12], Gangata's [7] and Hiz-Ediz [10] tests.



**Fig 1.** The easily distinguishable tendon of PLM (A) and flexor carpi radialis (B) in the right hand, and the diffuse protrusion in the left hand (C).

Neither of the performed tests gave a convincing result. Although during Thompson's and Schaeffer's tests a tendon could be palpated on the forearm, it could not be visualized, and it was impossible to determine whether it is the tendon of palmaris longus or another muscle. Thus it was decided to continue the examination with ultrasound imaging.

According to the results of ultrasound examination, the PLM in the left hand was wider (by 0.59 cm – 18.67%) then in right hand – 3.75 cm in left hand at the widest part of the muscle, and 3.16 cm in right hand at widest part of the muscle (Fig 2.).

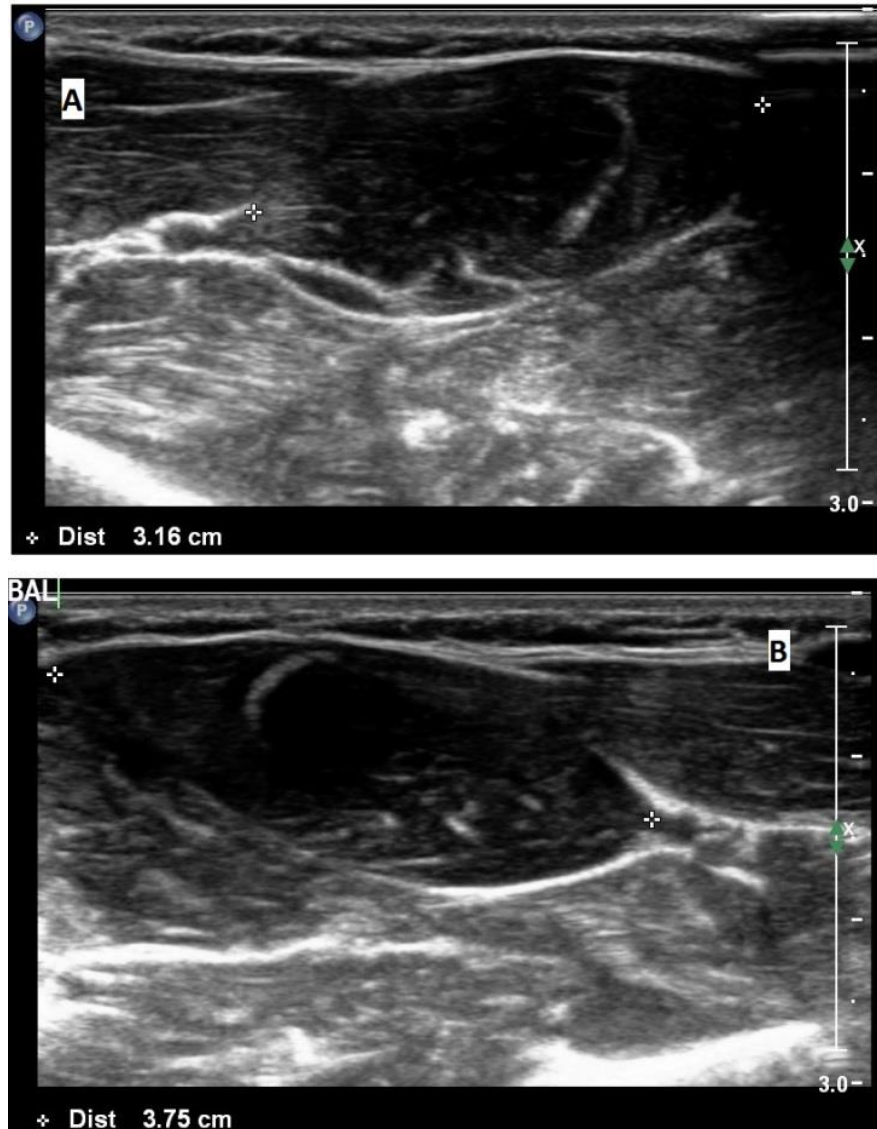


Fig 2. Ultrasound image showing the PLM in the right (A) and left (B) forearm at its widest part.

There was a bigger difference in the length of the muscles (3.7 cm – 46.83%) – the muscle length was 7.9 cm in the right hand, and 11.6 cm in the left hand. The tendon of PLM in the left hand run deeper than in right hand, but still passed over the retinaculum flexorum. The unusual course of the tendon made the visualisation and palpation during previous tests problematic.

**Discussion.** The loss of function of the PLM and the muscles superficial location, easy accessibility and the fact that the muscle is fully developed at birth and can be used as tendon donor muscle in any age group, make it the first-choice donor muscle for tendon grafts in plastic and reconstructive surgery, which is the main reason of most investigations of the palmaris longus muscle. The loss of function also allowed the PLM to become one of the most variable muscles in the human body. The variations of PLM usually remain undetected, unless they

cause pathology in the patients hand and consequently are detected by examining doctor. This is why our primary knowledge about variations of the PLM comes from case reports dealing with pathologies caused by the muscle. Yet the exact percentage of variations of PLM is unknown, since not all of them cause pathologies, and thus not all of them are detected. The described variation of PLM is one of the mentioned above cases. The enlarged PLM and the tendon running deeper than usual, unlike the most cases where a variation of PLM is described did not caused any problems in the patients hand, and was detected only because the thorough examination of patients forearm. The described case proves that the exact number of PLM variations could be much higher than it is shown in literature [1, 2, 4, 5, 6; 9, 15, 19, 20, 21, 22, 23].

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