Palmaris longus muscle variants: Well known, but what's new?

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Classically, the palmaris longus muscle (PL) starts from the medial epicondyle of the humerus and from the adjacent intermuscular septa and deep fascia, then continues into a long tendon, which passes superficial to the flexor retinaculum and after crossing it, the tendon broadens out to become into a flat sheath which incorporated into the palmar aponeurosis [1].

The PL has been established as one of the most variant muscles in humans [1-7]. But where does interest in this variable muscle, whose function for the hand is limited, come from? The biggest interest is expressed by classical anatomists in descriptive anatomy, as well as by hand and reconstructive surgeons. Why hand surgeons? First, after PL removal, there is no deficiency in hand function, thus it has become an excellent graft for surgeons. Second, some of the PL variations, the reversed PL (RPL) and PL profundus (PLP) in particular, have a definite role in acute or chronically provoked median nerve entrapment neuropathy. Third, a RPL or bifid or trifid RPL could also simulate a soft tissue tumour. Fourth, a possible expression of genes responsible for PL variations.

Until last year, the only classical classification which existed in the literature was that of Reimann et al. [8]. They classified PL variations as: absence, variants in position and shape, aberrant attach at origin or insertion, duplicated or triplicated, additional parts, or replacing elements of similar form or position.

Recently, two new classifications appeared in the literature [5,7]. One of them was proposed by Georgiev et al. [5]. These authors suggested that PL variations be divided for the classical anatomist, termed anatomical classification and for clinicians, particularly hand and reconstructive surgeons, termed clinical classification. The first group of anatomical classification presents various PL variants with differences in the typical position and/or additional muscle bodies: 1) RPL, bifid or trifid RPL and RPL together with aberrant abductor digiti minimi muscle; 2) Digastric PL; 3) PL with intermediate muscle body. The second group includes PL with variant tendon and/or additional muscles: 1) Absence; 2) Duplication; 3) Triplication; 4) Additional parts to the muscles of the hypothenar region; 5) PLP. The other, clinical classification divides PL variations in two groups. The first group includes those variants that could provoke compression to the median (MN) and/or ulnar (UN) nerves or those that could simulate a tumour formation: 1) RPL, bifid or trifid RPL and RPL together with aberrant abductor digiti minimi muscle (possible compression to the MN and/or UN or simulating a tumour formation); 2) Digastric PL (possible compression to the MN or simulating a tumour formation); 3) Additional slips (possible compression to the MN and/or UN); 4) PLP (possible compression to the MN and/or UN); 5) PL with centrally located muscle part (simulating a tumour formation). The second group includes variants of PL related to reconstructive surgery: 1) Absent (no graft); 2) Duplicated or triplicated PL (additional grafts).

Olewnik et al. proposed the other novel classification [7]. They described three types of PL based on different variations in insertion. Type I includes PL, that the muscle part of which starts as usual and its tendon inserts on the palmar aponeurosis. In type II, the origin of PL is as in type I. However, distally, the tendon of PL bifurcates: the lateral part of the tendon inserts in the palmar aponeurosis, while the medial part inserts in the flexor retinaculum. Type I and Type II are subdivided into: A, B and C based on variations in the tendon-to-muscle length ratio. Type III is categorised as "rare variations".

Finally, knowledge of the reported and the novel anatomical variants, as well as proposed novel classifications discovered in anatomical or surgical journals, such as the IJAV, is so important to successful knowledge and outcomes in the clinical practice.

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