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Complex made Simple...clinically relevant education by Judy C. Colditz, OT/L, CHT, FAOTA

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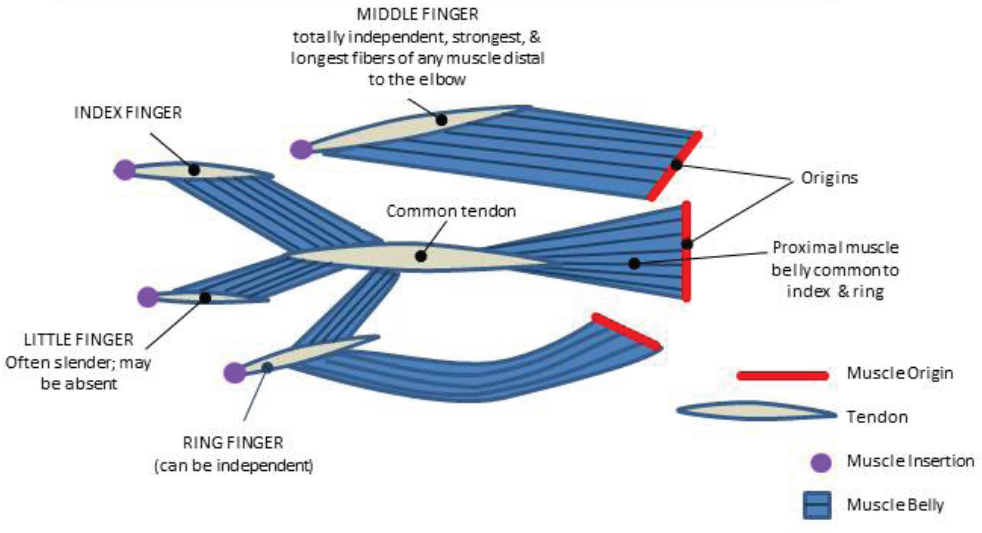
THE SUPERFICIALIS IS NOT AS SIMPLE AS IT SEEMS…

It is common knowledge that the flexor digitorum profundus (FDP) muscle-tendon unit of each of the three ulnar digits is not fully independent of the others, necessitating flexion of all three ulnar digits when requiring any one of these fingers to fully flex. Unlike the FDP, the flexor digitorum superficialis (FDS) muscle-tendon units are considered independent. Thus the common maneuver for testing the FDS is to hold all other fingers fully extended while allowing only one finger at a time to flex, assuring the proximal interphalangeal (PIP) joint actively flexes but there is no tension from the FDP across the DIP joint.

This common maneuver assumes the FDS has four independent muscle bellies. Brand & Hollister clarify that the configuration is far more complex. They describe the "common digastric muscle" ("digastric" describing a fleshy muscle portion joined by a tendon) and give us a highly schematic drawing (redrawn below) to illustrate this complexity. (1)

From this illustration one can see that the middle finger is the most independent and also is the strongest since it is the largest in cross section. The index and little fingers usually have two muscle bellies. The proximal belly connects to a common

SCHEMATIC DRAWING OF THE SUPERFICIALIS MUSCLE/TENDON CONFIGURATION (from Brand & Hollister)



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tendon from which a separate distal belly arises for each muscle. Additionally, the little finger tendon is often inadequate (very small or completely absent.) (1-2) The ring finger is unique in that it usually is also digastric with one belly from an independent separate origin and the other muscle belly arising from the common tendon of the index and little.

So what does this mean to clinical practice?

The most relevant clinical application is the fact that one will not necessarily see PIP flexion of the little finger when the other three fingers are held in full extension. Because the little finger FDS is often very small (with insufficient power) or may be absent, often it cannot flex the PIP joint alone. If, however, the ring finger PIP is allowed to flex concurrently with the little finger PIP, one can observe if there is a functioning FDS to the little finger. Holding the middle and index fingers fully extended continues to prevent the FDP from being able to contribute to flexion on either the ring or little fingers, requiring isolated PIP flexion in both digits. Because of the likely absence or inadequacy of the FDS of the little finger, one should never make a clinical diagnosis or treatment decision based on a manual muscle test to this muscle.

1. Brand PW & Hollister A: Clinical mechanics of the hand, St. Louis, 1993, Mosby Year Book, pp. 317-322.

2. Yu H-LY, Chase RA & Strauch B: Atlas of hand anatomy and clinical implications, St. Louis, Mosby, 2004, pp 286-287.

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