

Case of an Abductor Pollicis Longus Muscle: Variation or Differentiation?

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Summary: A variation of the abductor pollicis longus muscle in a 65 year old cadaver was encountered during routine dissection in our department. The muscle was found to split into two bellies and give off two tendons, one of which inserted to the abductor pollicis brevis, opponens pollicis and flexor pollicis brevis muscles. The other tendon inserted to the first metacarpal bone which is considered a normal insertion site for the abductor pollicis longus muscle.

The abductor pollicis longus muscle generally consists of one tendon which inserts to the dorsal surface of the proximal end of the first metacarpal bone. However, the tendon may bifurcate before insertion to the base of the first metacarpal, the other, to the trapezium. The latter may also blend with the muscle fibers of the abductor pollicis brevis and opponens pollicis^{1–4}).

The most common variation in the muscle is that it may have two tendons at its insertion although in rare cases, three tendons may also be found^{5–8}).

The abductor pollicis longus muscle, together with the abductor pollicis brevis, functions in abduction of the thumb and plays an accessory role in its extension and opposition. In this way, it has an undeniable effect in the act of grasping, in which the thumb is a major participant.

Materials and Methods

The variation was encountered during routine dissection, in a 65 year old male cadaver.

Results

It was found in our cadaver that the abductor pollicis longus muscle split into two bellies after which it gave off two tendons (Figures 1, 3). One of these tendons was longer and thinner compared to the other. This tendon divided into three slips and

inserted to the abductor pollicis brevis, opponens pollicis and flexor pollicis brevis muscles (Figures 2, 4). It was observed that the tendon slip which inserted to the abductor pollicis brevis acquired muscular characteristics prior to insertion. The slip to the flexor pollicis brevis was very thin. The second tendon which was thick and short inserted to the base of the first metacarpal.

Discussion

Although variations in the origin of the abductor pollicis longus are rare, it is generally accepted that the muscle presents many variations in insertion, both in number and type, some of which were also revealed during previous dissections in our department^{7,9}).

These variations are usually found at sites in which the tendon courses near the extensor retinaculum or just around the point where it passes the retinaculum. In most cases the tendon is seen to bifurcate. However, differences in insertion characteristics and areas are also frequented. Kosughi *et al.*¹⁰) report that in some cases in which the abductor pollicis brevis is absent, a slip from the abductor pollicis longus tendon inserts to the normal insertion site of the lacking muscle.

In the case of our variation, one of the two tendons of the muscle presented three slips, one inserting to the abductor pollicis brevis in the form of muscular fibres, the other, to the opponens pollicis, and the

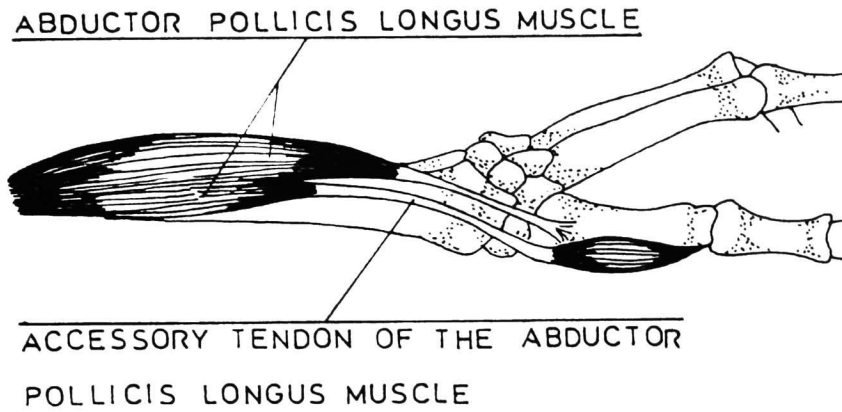


Fig. 1. Variation in the abductor pollicis longus muscle (dorsal view).

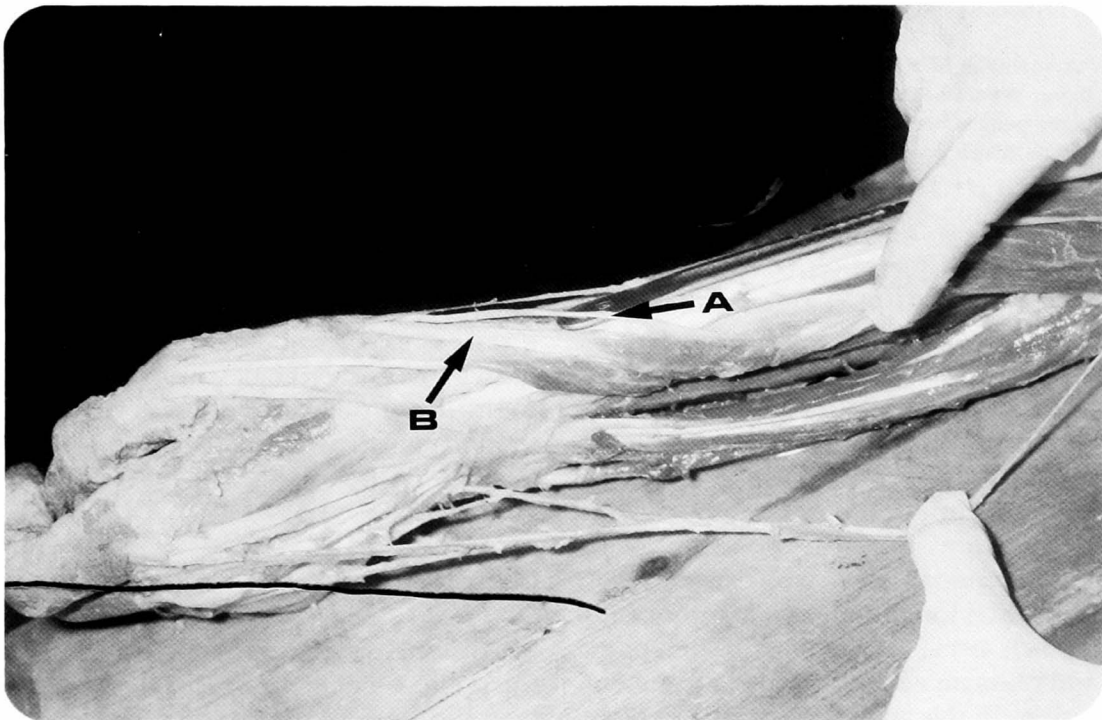


Fig. 2. The abductor pollicis longus muscle (dorsal view). a- Accessory tendon. b- Tendon inserting to the first metacarpal.

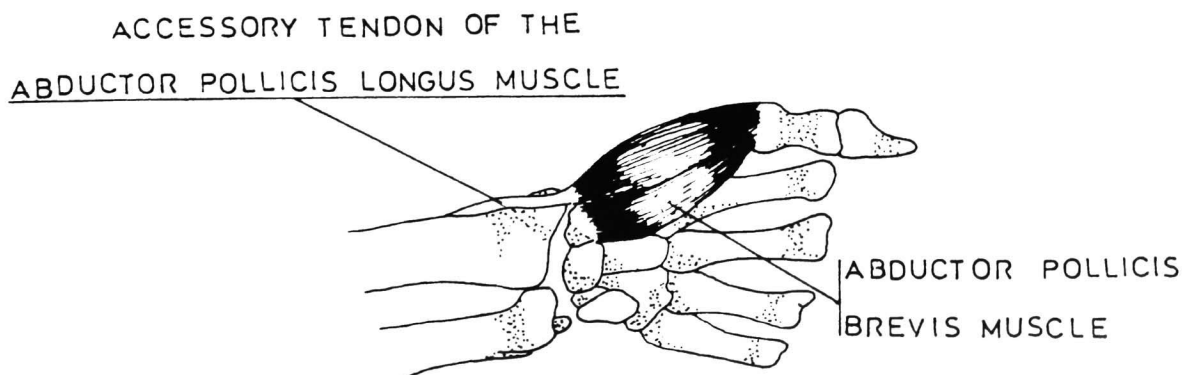


Fig. 3. Variation in the abductor pollicis longus muscle (ventral view).



Fig. 4. The abductor pollicis longus muscle (ventral view). a- Accessory tendon. b- Tendon inserting to the first metacarpal. c- Part of the accessory tendon showing muscular characteristics. d- The abductor pollicis brevis muscle.

last and smallest slip, to the flexor pollicis brevis. It is obvious that in the presence of such a variation, functional changes should be expected in the movements of the thumb which plays a very important part in holding, grasping and seizing actions. Additionally, knowledge of variations is important in diagnosis of certain diseases as well as in carrying out surgical procedures.

The complex movements which occur in the thumb as well as the hand itself, may well account for the numerous muscles and related tendons which course around and within this area. Consequently, the frequency of variations encountered among these muscles should only be considered as a natural outcome of their vast amount. The variations in the extensor muscle group of the forearm have been interpreted by Kosughi *et al.*¹⁰⁾ as result of a probable differentiation process in these muscles. The fact that the abductor pollicis longus is one of the few muscles which present so many variations both in type and number, leads us to ask the question, in the light of the above mentioned view, whether it will differentiate into a muscle of different characteristics from the present.

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