

Bilateral Accessory Extensor Digitorum Muscle in Hand: A Case Report

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Abstract: During dissection, presence of bilateral accessory extensor muscle in the hand was observed in one cadaver. It showed differences in its origin, division into digital slips and additional features in relation to extensor digiti minimi muscle on both the sides. Its origin from the forearm (on both sides) was more extensive on the right side. It was seen to be dividing into three slips on the right side and four on the left. Interestingly, on both sides, no slip was observed for the ring finger. Extensor digiti minimi muscle was present on the right side but absent on the left, Extensor indicis-muscle was absent on both sides.

Key words : *Accessory extensor digitorum in hand.*

Introduction

Many an instance of supernumerary muscle on the dorsum of the hand have come to light since the entity was first described by Albinus in 1734¹. This extensor digitorum brevis manus was a controversial entity for a long time because it exhibited an infrequent clinical expression^{9,10,11}. It has appeared as a painful mass with repeated exercise, being misdiagnosed as a dorsal wrist ganglion, tendon sheath cyst, tenosynovitis of extensor tendons, hemangioma, and so on usually deleted on surgery^{4,5,7,9,10,11,12}. A chance encounter of this muscle during routine dissection is being presented here.

Case Report

Bilateral accessory extensor digitorum muscle in the hand was observed in one formaldehyde fixed male cadaver during routine dissection. It showed a number of differences on the two sides.

Right hand (Figure) the muscle originated from the lower end of dorsal surface of shaft of ulna, the adjoining interosseous membrane and intermuscular septa between it and adjoining extensor muscles. It divided immediately into three bellies, the tendons of which passed under cover of extensor digitorum tendons in the fourth osteogascial compartment beneath the extensor retinaculum. Each of the three slips (all of equal thickness) crossed the dorsum of the hand to pass to the thumb, index and middle fingers. At the level of the heads of metacarpals of these digits, the tendons merged with the extensor expansion. The extensor indicis muscle was absent. The right and little fingers received no contribution from this muscle and the extensor digiti minimi muscle was present, as normally seen. The nerve supply to the muscle was through the posterior interosseous nerve.

Left hand The muscle was observed to be originating from the dorsal aspect of lower one third of the interosseous membrane and few fibers from adjoining shaft of ulna. Just after its origin the muscle was seen to divide into four small bellies, the tendons of which passed through the fourth osteofascial compartment under cover of extensor retinaculum deep to tendons of extensor digitorum.

The four slips crossed the dorsum of the hand to reach the thumb, index, middle and little fingers. The ring finger received no contribution. Of the tendons, one to the thumb was the thickest,

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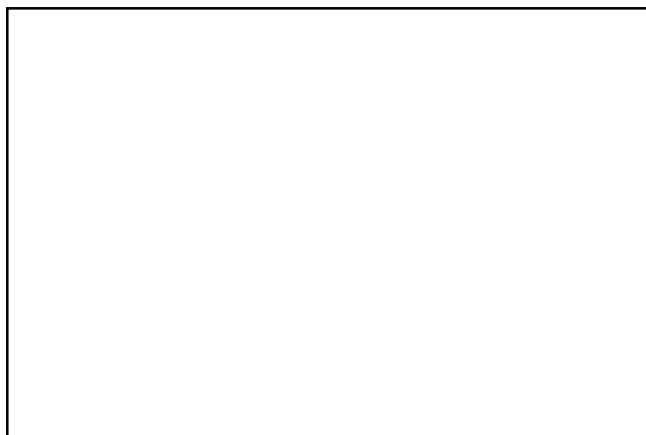


Fig.: The accessory extensor digitorum muscle in left hand.

followed by the index, little and middle fingers in decreasing order of thickness. The tendons were merging with the extensor expansion at the level of heads of metacarpals. The muscle was receiving its nerve supply from the posterior interosseous nerve.

The slip to the little finger divided into two, one inserting in the middle of the fifth metacarpal head like the others whereas the other passed laterally to merge with the extensor expansion. This probably replaced extensor digiti minimi, which was absent here. The extensor indicis was also absent.

Discussion

The extensor digitorum brevis manus is a rare muscle found on dorsum of the hand. This muscle has been described in terms of its anatomy, incidence, ontogeny, phylogeny and clinical significance by various authors. Its clinical expression on the dorsum of the hand is in the form of pain or swelling thereby leading to a misdiagnosis of a ganglion. However, in most cases it may be clinically asymptomatic and hence of minor importance and is therefore more of phylogenetic interest. During development, the extensors of the forearm are seen to differentiate from three parts: superficial, radial and deep⁴. The superficial layer gives rise to Extensor digitorum, Extensor carpi ulnaris and Extensor digiti minimi. The radial part forms Brachioradialis and Extensor carpi radialis longus and brevis whereas the deep part gives rise to Abductor pollicis longus, Extensor pollicis brevis and longus and Extensor indicis. The superficial and radial parts are phylogenetically stale whereas the deep part is not.

In early developmental stages, forearm muscles are derived from three groups: the brachioantebrachial acting on the elbow joint, the antebrachiomanual acting on the wrist joint and the manual group acting on joints of hand⁴. IN graduation to mammals, the brachioantebrachial group has undergone distal migration to lie superficial to antebrachiomanual group and the latter in turn has migrated distally to become continuous with brevis muscles of the hand. These later lose thier attachments to the carpus and become totally incorporated in the tendinous portions of long forearm extensors.

On comparing ontogenetic and phylogenetic development of individual muscles, it maybe deduced that brachioantebrachial group may have given rise to both superficial and radial layers and the antebrachiomanual to the deep layer. The manual group had disappeared completely.

Another theory put forward by Peeling⁸ suggests that the extensor digitorum brevis manus is derived from dorsal interossei but since the posterior interosseous nerve in the present study was supplying the muscle, this theory is questionable. Bingold², Boyes³ and Kaplan⁶ regard this muscle as homologous to the extensor digitorum brevis muscle of the foot. Since in the present study one of the muscle tendons was extending to the thumb (as in the foot) a conjecture of homology with the corresponding muscle in the foot may be made.

Since the Extensor indicis muscle was absent on the both sides, it may be considered that the Extensor digitorum brevis fmanus in the present study may be its representative, dividing into three and four slips in right and left hand respectively. It is interesting to observe that no contribution from this muscle extend to athe ring finger on both sides. Does it indicate an intermediate phase in evolution from a complete form (as in the foot) to its total

absence? The question is debatable.

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