

Unique Anomalous Muscle in the Extensor Compartment of Forearm

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Abstract

Extensor compartment of the forearm has superficial and deep group of muscles. All the muscles of this compartment arise from the lateral epicondyle and insert either on metacarpals or phalanges. During routine cadaveric dissection, we found an anomalous muscle with its tendon in the center of dorsum of palm. When traced, it was originating from the carpal bones and inserting at the dorsum of the base of proximal phalanx of middle finger. It was supplied by the posterior interosseous nerve. The numerical variations in the tendinous slips of some muscles of extensor compartment is not uncommon. Anomalous muscles in extensor compartment like Extensor digitorum brevis manus, extensor indices proprius and extensor medii proprius are reported in the literature. But this variant muscle in our case is not having any similarity with any of those variations reported in literature. It can be called as Variant Extensor digitorum manus. The knowledge of such rare variant muscle is important for surgeons for tendon transfer, tenosynovectomies, grafting and tendon repair surgeries to prevent inadvertent injuries.

Keywords: Anomalous Muscle; Extensor Digitorum Brevis Manus; Tendon Grafting

Introduction

Extensor compartment of forearm consists of seven superficial and five deep muscles. All these muscles arise from the lateral epicondyle of humerus which is the common extensor origin and insert either on the dorsal surface of metacarpals or on the dorsum of phalanges. The anomalous muscles reported in extensor compartment in literature are extensor indicis proprius, extensor digitorum brevis manus, extensor medii proprius and extensor indices et medii communis [2-5]. Extensor digitorum is the central muscle of this compartment which forms four tendinous slips for medial four fingers. These tendons pass deep to extensor retinaculum along with other extensor tendons of the compartment and inserts by forming extensor expansion or dorsal digital expansion. Normally when we observe, the dorsum of the hand, we see single extensor tendon on each digit except the index finger and little finger which shows two tendons. The other tendon on the dorsum of index finger is of extensor indices which is one of the deep muscle of extensor compartment while the other tendon for little finger is of extensor digiti minimi. Except these tendons no other tendons are found on the dorsum of hand normally [1].

The present case report is a rare case report of extra anomalous muscle in the extensor compartment. The muscle was found in the center of extensor compartment deep to the extensor digitorum tendons. It was originating from the carpal bones and inserting on the base of proximal phalanx of the middle finger.

The numerical variations in the number of slips of different extensor muscles are not uncommon. The additional slips for extensor indices, abductor pollicis longus and extensor digiti minimi are reported in the literature. The other anomalous muscles reported in the

literature are extensor digitorum brevis manus, extensor indices proprius and extensor medi proprius. Our case does not show any similarity with these reported variants. The presence of such extra anomalous muscle in the extensor compartment arising from the dorsal surface of carpal bone and inserting on the base of proximal phalanx of middle finger is not reported in the literature till date.

Case Report

During routine cadaveric dissection, we found an anomalous muscle in the center of the dorsum of hand. When traced, this muscle was originated from the lateral carpal bones with some contribution from the extensor retinaculum. The tendon of the muscle is inserted at the dorsum of the base of proximal phalanx of middle finger. This anomalous muscle was not the part of extensor digitorum and it was inserted separately without extensor expansion. On further meticulous dissection, we found that it was supplied by posterior interosseous nerve which is the main nerve of the posterior compartment.



Figure 1: Showing Variant Muscle Located Deep to the Extensor Digitorum.



Figure 2: Showing Variant Muscle Arising from the Carpal Bones and Extensor Retinaculum and Inserting at the Base of the Proximal Phalanx of Middle Finger.

Discussion

Extensor digitorum is the chief superficial muscle of the extensor compartment. It is the central tendon of dorsal digital expansion. The numerical variations in the number of tendons of the extensor compartment muscles are not uncommon. Some anomalous muscles in the extensor compartment are also reported in the review of literature.

Soubhagya R [6] in her study mentioned anomalous muscle in the extensor compartment of forearm arising from the proximal one third of ulna and inserting on the base of styloid process of radius. This muscle was confined to the forearm and was supplied by posterior interosseous nerve. Jing li [7] described bilateral dorsal medi proprius which originated from the distal third of ulna and inserted on the dorsal expansion of the middle finger. H P von Schroeder [8] mentioned in his study the 10.3% incidence of the extensor medii proprius while 3.4% incidence of the extensor indicis et medii communis while Joel C Klena [9] mentioned the incidence of 9% and 16% respectively.

With the best of our knowledge, the anomalous extra muscle arising from the radial side of carpal bones and inserting on the base of proximal phalanx of middle finger is not mentioned in the literature till date. During dissection of the posterior compartment of the forearm, we found one extra tendon for the middle finger. Unlike other extensor tendons of extensor digitorum it was not inserting on the base of middle phalanx but was traceable only till the base of proximal phalanx. When traced backwards, after meticulous dissection we found this variant muscle arising from the carpal bones with some contribution from the extensor retinaculum and was supplied by the branch of posterior interosseous nerve. This muscle was present in the centre of posterior compartment of forearm deep to the extensor digitorum muscle.

When compared to the previous reported anomalous muscles in the literature, present case report can be called as variant of extensor digitorum brevis manus. G Paraskevas [10] has found one rare variant muscle which was originating from the wrist capsule and inserting on the base of proximal phalanx of middle finger on ulnar side. In our case, the origin is from the carpal bones with some contribution from extensor retinaculum.

These variations can be correlated developmentally. Pre extensor muscle mass during development differentiates into superficial, radial and deep portion. The deep portion during differentiation undergoes marked variations as per the comparative anatomy studies. The variations in the extensor compartment muscle is attributed to the variant differentiation of the superficial, radial and deep part [11]. The variations in the extensor compartment muscles are important for operating surgeons for tendinopathy, tendon transfer and tendon repairs. For the tenosynovectomies carried out for Dequervain's disease, the anatomical knowledge of extensor tendons is important [12]. Synovitis of extensor tendons is common in rheumatoid arthritis. In such cases, the additional tendon slips are more prone to rupture [13]. The presence of such anomalous muscle in dominant hand can lead to complications of fourth compartment syndrome and extensor retinaculum release can be required in symptomatic cases [10].

Conclusion

Present case report is a rare variation of an anomalous muscle in the extensor compartment of the forearm. Such unique variants either accidentally get discovered in operation theatre during surgery or in cadaveric dissection. Knowledge of such variations are important clinically to avoid inadvertent injury during different hand surgeries like tendinoplasty, tendon transfer and grafting and to manage complications like fourth compartment syndrome.

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