

**Accessory Extensor Indicis: A Case Report with Its Clinical Significance**

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Conflicts of Interest: Nil.

Abstract

Introduction: The extensor indicis muscle belongs to the deep set of muscles of the extensor compartment of the forearm. Variations of muscles of extensor compartment are very common especially extensor indicis muscle during dissection as well as surgery.

Method & Result: Variation of extensor indicis muscle was observed in a formalin fixed specimen during routine dissection as accessory muscle. Accessory Extensor Indicis muscle was having two tendinous slips. One slip of tendon got inserted into the tendon of extensor digitorum and dorsal aspect of the capsule of the metacarpophalangeal joint of the middle finger while other one which was comparatively thin got merged with the fascia on the dorsal aspect of hand.

Conclusion: The additional bellies can be used for grafting purpose if there is injury to any muscle. The knowledge of these variations are important for clinicians as well as surgeons.

Keywords: Accessory Extensor Indicis; Muscle; Tendinous Variation.

Introduction

The extensor indicis muscle is a narrow elongated muscle which belongs to the deep set of muscles of the extensor compartment of the forearm lying medial and parallel to extensor pollicis longus. It normally arises from the posterior surface of the ulna and the adjoining interosseous membrane distal to the origin of extensor pollicis longus. Its tendon passes under the extensor retinaculum in a common compartment with tendons of the extensor digitorum and get inserted into the ulnar aspect of the dorsal digital expansion of the index finger. The extensor indicis extends the index finger and assists in extending the wrist.¹

Variations of muscles of extensor compartment are very common during dissection as well as surgery. These variations could be seen in the form of additional bellies, abnormal attachments and extra tendons. Extensor indicis occasionally give accessory slips to the extensor tendons of other digits. It is rare to observe any interruption of its tendon by an additional muscle belly on the dorsum of the hand. There could be the presence of two heads or complete duplication of tendon of extensor indicis.² Rao et al observed the presence of extensor indicis brevis in

addition to normal extensor indicis and in the absence of the normal extensor indicis.³ This muscle allows independent extension of the index finger, is frequently used for tendon transfer. Knowledge of the various types of this muscle is desirable for the repair or transfer of its tendon.⁴ Anatomical knowledge of such variation should be considered while performing tendon graft surgeries in the hand.

Case Report

Material and Method

Muscle variation was observed in formalin fixed specimen of left upper limb during routine dissection while teaching the under graduate students. The whole posterior area of the forearm was exposed.

Observation

During dissection, it was noted that an accessory muscle has a parallel origin to extensor indicis muscle but its muscular belly was smaller as seen in Fig.1. Accessory Extensor Indicis muscle was having two tendinous slips as shown in Fig.2. One slip of tendon got inserted into ulnar side of tendon of extensor digitorum and dorsal aspect of the capsule of the metacarpophalangeal joint of the middle finger while other one which was comparatively thin got merged with the fascia on the dorsal aspect of hand. A thin communication was also observed between extensor indicis and accessory extensor indicis muscle. It is having its vascular supply by ulnar artery while nervous supply by posterior interosseous nerve branch of radial nerve. This variation was found only in one limb on left side. Any indication of associated pathology with this anatomical variation was not found during our observation.

Discussion

Embryological Basis

Limb muscles arise from cells derived from somatic mesoderm during embryological period. Myogenic cells

form dorsal and ventral common muscle masses which split into primordia of individual muscles. Connective tissue associated with the muscle is having morphogenetic control rather than in the muscle cells. Later stages may involve cell death, the fusion of muscle primordia and the displacement of muscle primordia to other areas.⁵ Accessory muscle might arise due to abnormal displacement of muscle primordia to other site.⁶

Extensor tendons especially the extensor indicis show frequent variations. These variations can be in the form of two heads or double tendon of extensor indicis.¹

Komiyama et al. classified the variations of the extensor indicis muscle into different types. Out of these variations type 3a matches with the present study according to which the supernumerary tendon was found on the ulnar side of Extensor indicis and was inserted into the middle finger.⁴ Yoshida described this anomalous muscle as the Extensor medii proprius (EMP).⁷

Anatomical variations in the muscle or tendon of the hand and wrist are useful in repairing or reconstruction of hand injuries. The extensor indicis tendon is often used for tendon transfer. Complete removal of the extensor indicis muscle can create the risk of losing independent extension of the index finger. Hence, this may look like a pathological condition. It is usually misdiagnosed as a ganglion, tendon sheath cyst, tenosynovitis of the extensor tendons or benign soft-tissue tumor.^{8,9} Ultrasonography may further aid in diagnosis. Anomalous extensor indicis muscle is rare and rarely causes wrist pain. Hence, awareness of presence of this extensor tendon is important while performing the tendon transfer for managing hand disease.

Baker and Gonzalez observed that the majority of the enlarged extensor indicis muscle belly was found to be present beneath the extensor retinaculum.¹⁰ Extensor indicis proprius syndrome was described by Ritter and

Inglis in which there was considerable tenosynovial proliferation surrounding the anomalous extensor indicis proprius muscle.¹¹ Kosugi et al. has observed in his study that the extensor indicis could be absent in 0.6 to 3% of cases.¹²

In the present study, the tendon of the muscle belly of accessory extensor indicis was divided into two tendinous slips. One of these slips attached to the ulnar side of the tendon of extensor digitorum and dorsal aspect of the capsule of the metacarpophalangeal joint of the middle finger while the other slip was very thin and merged with the fascia over the dorsum of the hand. In a report by Yoshida et al.⁷, the extensor medii proprius had two slips and both were attached to the tendon of extensor digitorum for the middle finger; in contradiction to this, the present case reported two tendinous slips with two different sites of insertion. Present study coincides with the study of Srinivas rao et al¹³ which reported extensor medii proprius muscle with two tendons got inserted on two different sites.

Conclusion

The additional bellies are usually asymptomatic and may go unnoticed if they are small. The additional bellies can be used for grafting purpose if there is injury to any muscle or tendon or both without sacrificing the normal muscle. If the muscle is large, it may get confused with various soft tissue conditions or it may also create confusion while operating the forearm extensor and hand regions. Risk of tenosynovitis may increase if the tendon of additional belly is thick as it may decrease the space in the respective compartment. Hence, the knowledge of these variations are quiet important for clinicians as well as surgeons.

Legends of Figures

Fig.1 Showing Accessory Extensor Indicis (AEI) along with Extensor Indicis (EI) and Extensor Digitorum (ED).

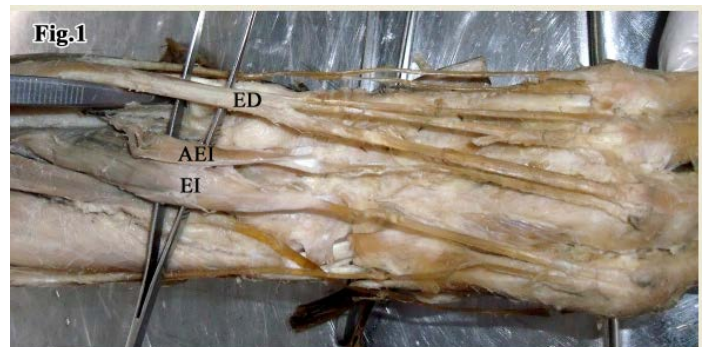
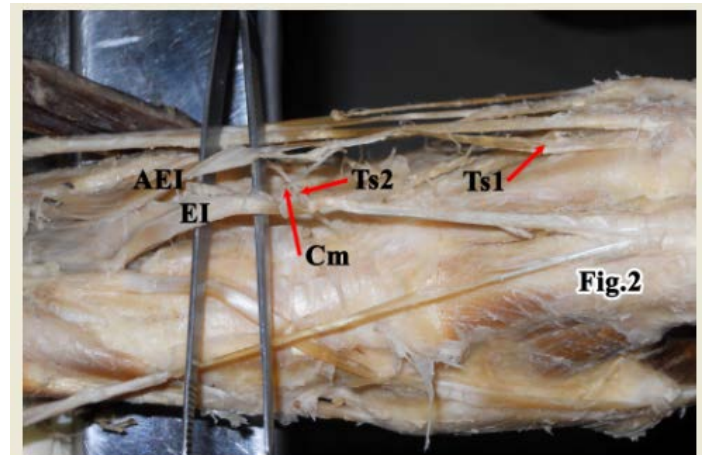


Fig.2 Showing Extensor Indicis (EI) and Accessory Extensor Indicis (AEI) with its two Tendinous slips (Ts1 & Ts2) respectively. There is a Communication (Cm) between Extensor (EI) and Accessory Extensor Indicis (AEI).



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