

# An Unusual Additional Flexor Digitorum Profundus Muscle to the Index Finger and its Clinical Significance

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**Abstract:** *The flexor digitorum profundus is the deep flexor muscle of the forearm. It is a composite muscle with a dual nerve supply. The medial half of muscle is supplied by the ulnar nerve, and lateral half of the muscle is supplied by the anterior interosseous nerve, a branch of the median nerve. It flexes the distal phalanges of the medial four digits. During routine dissection of a 70 - year - old male cadaver allotted for the undergraduate students of the 2020 - 2021 batch in the department of anatomy, Sree Mookambika Institute of Medical Sciences, Kulasekharam, we observed the presence of extensive cleavage of belly and tendon of flexor digitorum profundus to form flexor indicis profundus on the right side in an adult male cadaver. The flexor indicis profundus muscle belongs to the progressive type of variation. Such variations are usually asymptomatic. Sometimes, it may cause compression of the anterior interosseous nerve, which can lead to compression neuropathy. If it is enlarged, it may simulate a ganglion.*

**Keywords:** Flexor digitorum profundus muscle, flexor indicis profundus muscle, anterior interosseous nerve, compression neuropathy, ganglion.

## 1. Introduction

Flexor digitorum profundus it is the bulkiest muscle of the forearm and takes origin from anterior and medial surface of the upper three - fourths of the shaft of the ulna and from the adjacent interosseous membrane. The muscle ends below into four tendons for the medial four fingers. the tendon for the index finger separates early in the forearm, but rest of the tendons remain united until they appear in the palm after passing beneath the flexor retinaculum within the carpal tunnel. As the four digital tendons separate in the palm, they provide origins to four lumbrical muscles. Each tendon enters within the fibrous flexor sheath of the digit and opposite the proximal phalanx it passes distally through the perforated digital tendon of flexor digitorum superficialis. Finally, each tendon is inserted to the palmar surface of the base of terminal phalanx of the medial four fingers. The lateral part of the flexor digitorum profundus muscle (associated with the index and middle fingers) is innervated by the anterior interosseous branch of the median nerve, and the medial part of the muscle (associated with the ring and little fingers) is innervated by the ulnar nerve (C8, T1). The flexor digitorum profundus is supplied by the anterior interosseous artery, which is a branch of the common interosseous artery. The flexor digitorum profundus is a flexor of the midcarpal (wrist), metacarpophalangeal, and interphalangeal joints of the index, middle, ring, and little fingers.

## 2. Literature Survey

According to the literature reviewed, the additional flexor digitorum profundus muscle to the index finger is extremely rare.

## 3. Methodology

During routine dissection of upper limb in a 70 - year - old male cadaver, allotted for the undergraduate student in the Department of Anatomy, Sree Mookambika Institute of Medical Sciences, Kulasekharam. Dissection of the upper limb was carried out according to the instruction given in Cunningham's Manual of Practical Anatomy Volume - 1 and we found the presence of extensive cleavage of belly and tendon of flexor digitorum profundus to form flexor indicis profundus on the right forearm.

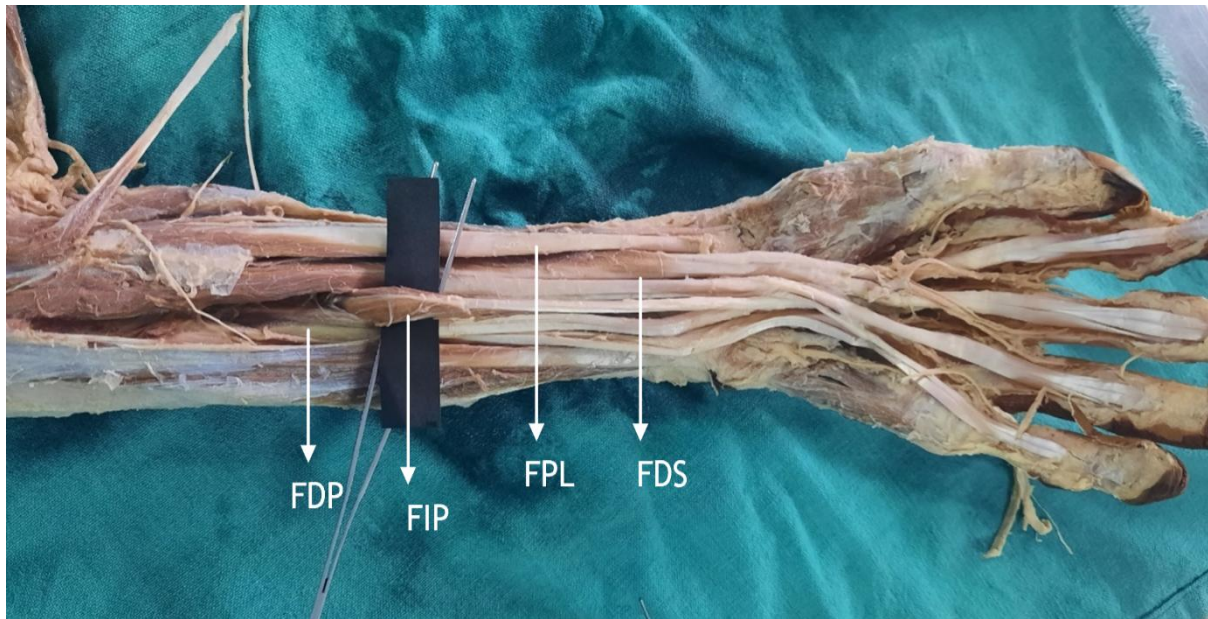
## 4. Results

We observed an extensive cleavage of the tendon for the index finger, from the rest of the tendons of the flexor digitorum profundus muscle. The flexor indicis profundus is a part of the flexor digitorum profundus. The flexor indicis profundus originated from the anterior surface of shaft of the ulna and the adjoining interosseous membrane, along with the flexor digitorum profundus. In the upper 3cms, the flexor indicis profundus muscle belly was fused with the flexor digitorum profundus, while in the lower part, the muscle belly was completely separated from the flexor digitorum profundus [Fig - 1]. On further dissection, the tendon of the flexor indicis profundus was found to be present between the flexor digitorum profundus and the flexor pollicis longus. The tendon was inserted to the palmar surface of the base of the distal phalanx of the index finger [Table/Fig - 2].

The anterior interosseous nerve which passed between the flexor digitorum indicis and the flexor pollicis longus, on a deeper plane, in the right forearm of an adult male cadaver, was observed. The medial half of the flexor digitorum profundus was supplied by the ulnar nerve and the flexor indicis profundus, which is the lateral half of the flexor digitorum profundus, was supplied by anterior interosseous

nerve, a branch of the median nerve. The flexor digitorum profundus muscle on the left side was normal, without any

extensive cleavage. No other muscular variations were found in the body.



**Figure 1:** Extensive cleavage of belly & tendon of Flexor Digitorum Profundus to form Flexor Indicis Profundus.

FDP - flexor digitorum profundus, FIP - flexor indices profundus, FPL - flexor pollicis longus, FDS - flexor digitorum superficialis.

## 5. Discussion

In the present study we found that there is an extensive cleavage of the tendon for the index finger, from the rest of the tendons of the flexor digitorum profundus muscle. The flexor indicis profundus is a part of the flexor digitorum profundus. The flexor indicis profundus originated from the anterior surface of shaft of the ulna and the adjoining interosseous membrane, along with the flexor digitorum profundus. In the upper 3cms, the flexor indicis profundus muscle belly was fused with the flexor digitorum profundus, while in the lower part, the muscle belly was completely separated from the flexor digitorum profundus (fig: 1). On further dissection, the tendon of the flexor indicis profundus was found to be present between the flexor digitorum profundus and the flexor pollicis longus. The tendon was inserted to the palmar surface of the base of the distal phalanx of the index finger. Mangini et al done a cadaveric study on the flexor pollicis longus muscle, in which an incidental finding of the flexor indicis profundus was found in two out of seventy - six forearms (2.6%) [2]. Le Gros et al observed an accessory bundle which arises from the coronoid process to form a tendon that joins the tendon of the flexor digitorum profundus and which goes to the index finger, is said to be found in about 20% of the cadavers and it is called the accessory tendon of the flexor digitorum profundus [3].

## 6. Conclusion

The flexor indicis profundus muscle belongs to the progressive type of variation. Such variations are usually asymptomatic. Sometimes, it may cause compression of the anterior interosseous nerve, which can lead to compression neuropathy. If it is enlarged, it may simulate a ganglion. These variations should be kept in mind to prevent

complications during surgical interventions of these regions. Knowledge on these variations is of importance, not only to the anatomists but also to the surgeons and orthopaedicians to avoid complications.

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