



## BILATERAL ABSENCE OF TENDON OF FLEXOR DIGITORUM SUPERFICIALIS FOR LITTLE FINGER-A CASE REPORT IN NORTH INDIAN POPULATION AND ITS CLINICAL SIGNIFICANCE

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<p><b>Article Info</b>  <i>Received 15/02/2015</i>  <i>Revised 27/03/2015</i>  <i>Accepted 17/04/2015</i></p> <p><b>Key words:</b> Flexor digitorum superficialis, Bilateral absence, Little Finger.</p>	<p><b>ABSTRACT</b></p> <p>The flexor digitorum superficialis muscle has been grouped as a retrogressive muscle as it represents remnants of connections between two sheets of muscles. The muscular abnormality in the flexor compartment of the forearm is less common as compared to that of the extensor compartment. During routine dissection of front of the forearm for undergraduate students in the department of Anatomy, Integral Institute of Medical Sciences and Research, Lucknow, U.P. India we observed that the FDS in both right and left forearms divided into only 3 tendons (instead of 4) for the ring, middle and index fingers. There was bilateral absence of tendon for the little finger. Also, no other variations were noted in the course and insertion of the remaining FDS tendons. The muscle was normally supplied by a branch of median nerve in the forearm. Variants of the FDS muscle of the little finger have been reported in the literature. Proper knowledge of muscular variations is essential not only for anatomists but also for orthosurgeons and plastic surgeons.</p>
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### INTRODUCTION

Variation in the origin of long flexor tendons in the anterior compartment of forearm is common. Normally, flexor digitorum superficialis (FDS) arises by humeroulnar and radial heads. Humeroulnar head arises from medial epicondyle of the humerus and medial margin of the coronoid process of ulna. The radial head originates from the anterior oblique line of the radius. Above the wrist, fleshy fibers of this muscle form four tendons for the medial four fingers of the hand. Tendons arranged in pairs in superficial and deep strata, pass beneath the flexor retinaculum within the carpal tunnel to enter the palm. Each digital tendon at the base of the proximal phalanx splits into two slips to allow the passage of tendon of the flexor digitorum profundus and then gets inserted into the sides of the shaft of middle phalanx of the corresponding digits [1]. The flexor digitorum superficialis muscle has been grouped as a retrogressive muscle as it represents

remnants of connections between two sheets of muscles. Anatomical variations of the muscles and nerves around the wrist are common. Variations when noticed have also been the cause for anxious moments on the operating table for the surgeon. Flexor digitorum superficialis tendons are often used in tendon transfers following injury to the ulnar and radial nerves [2]. Anomalies of the muscles and tendons have often entrapped vital structures like vessels and nerves producing compression symptoms. Digits of hand perform many fine movements which are essential for our daily life. Therefore a proper anatomical and surgical knowledge of muscular variations is essential to avoid errors in diagnosis and treatment.

### CASE REPORT

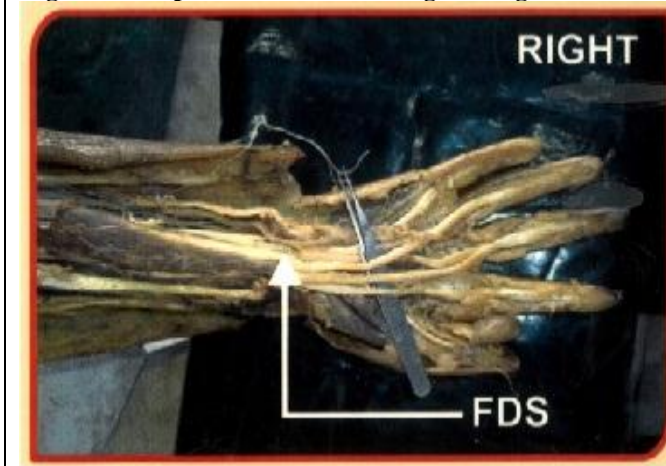
The current case is reported during routine dissection of the front of the forearm for undergraduate



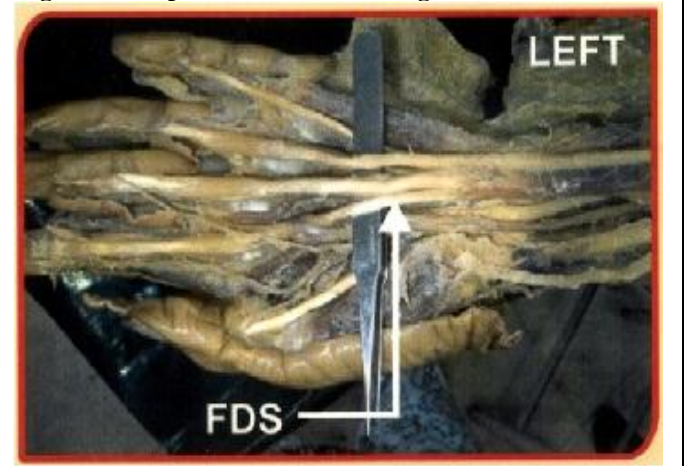
students in the department of Anatomy Integral Institute of Medical Sciences and Research, Lucknow, U.P. India. The embalmed cadaver dissection was performed on the muscles of the flexor compartment of both limbs was using Cunningham's Manual of Anatomy. After stepwise dissection of the front of forearm, we found the normal origin of the muscle by two heads, viz., humero-ulnar and

radial head. A branch of median nerve supplied the muscle. We observed bilateral absence of the FDS tendon to the little finger in the upper limbs of a 65-year-old male cadaver. The FDS divided distally into 3 tendons (instead of 4) for the ring, middle and index fingers. Relationship with neighboring structures was found normal and no other associated abnormalities were noticed.

**Fig 1. Dissection of the front of the forearm and palmar aspect of the hand showing absence of Tendon of Flexor Digitorum Superficialis for little finger in right hand**



**Fig 2. Dissection of the front of the forearm and palmar aspect of the hand showing absence of Tendon of Flexor Digitorum Superficialis for little finger in left hand**



## DISCUSSION

FDS is potentially a flexor of all the joints over which it passes, i.e., proximal interphalangeal, metacarpophalangeal and wrist joints. It has independent muscle slips to all medial four fingers and is therefore, able to flex the proximal IP joints individually. In the amphibians, there are two layers of forearm flexor muscles and these muscles act as wrist flexors. The fingers in amphibians are flexed by several layers of muscles originated from the palmar aponeurosis or flexor retinaculum, known as the "brevis" type of muscles.

Bowman et al. [3] examined the effect of FDS-absent and FDS-common presentations of the little finger on grip strength and suggested that hand therapists should expect lower results when measuring grip strength of FDS-absent or FDS-common individuals. However, in the present case, bilateral absence of the FDS little finger tendon may contribute to a diminished grip strength. Another study confirming it is by Methot et al. [4], determining the contribution of ulnar digits to overall grip strength. Godwin et al. [5] suggested that independent FDS function is important for professional musicians playing at an elite level. Flexor digitorum superficialis, formerly called sublimis stretches across the forearm between the medial epicondyle and the radius and separates the superficial group of muscles from the deep group throughout much of the forearm [6]. Schmidt 1990 [7] also described this finding in both the hands of an eighty five

year old female. The muscle bellies of the superficial finger flexor muscle for the little finger were absent. Instead of this, a thin tendinous cord arose from the tendon of the flexor digitorum superficialis of the ring finger proximal to the carpal tunnel to pass into the radial side of the flexor tendon sheath of the little finger at the level of the annular ligament. Together with an abortive tendon on the ulnar side the tendon was inserted into the middle phalanx.

In terms of Clinical and functional significance; the abnormalities of muscles and their tendons in the forearm although not common are important to the clinician in appropriate detection of etiology for symptoms and management of the patient [8]. The absence of the FDS may influence clinical examination in injured hands [9]. Thus, FDS has been used as a motor for a wide variety of tendon transfer operations in the hand. Most of these transfers are on the volar side of the hand and are used to restore synergistic actions (such as opposition of the thumb) or as intrinsic replacements [10].

## CONCLUSION

The variation reported in the present case is though common in its presentation but, knowledge of such variation could be useful for the clinicians, hand surgeons and plastic surgeons in tendon transfer in nerve injuries, repair in lacerated injury and hand reconstruction surgeries.



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