Variations of the Extensor Digitorum Communis Tendon of Hand
A Cadaveric Study in South Indians

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ABSTRACT

Introduction: Knowledge of extensor tendons over the dorsum of hand is important for anatomist as well as clinicians to carry out surgical repairs of tendons and to treat pathological conditions associated with tendon.

Aim: To study frequency of occurrence of variations of the Extensor Digitorum Communis tendon slips on the dorsum of hand in South Indian cadavers.

Materials and Methods: Material for the study consisted of 50 formalin fixed adult cadavers (100 upper limbs) of South Indian origin aged between 30 and 70 years old allotted for undergraduate dissection in the Department of Anatomy, Aarupadai Veedu Medical College, Pondicherry.

Observations: Out of hundred dorsums of the hand studied, Extensor Digitorum Communis showed four slips in 95 specimens i.e., one for index finger (EDCI), one for middle finger (EDCL), one for ring finger (EDCR) and one for little finger (EDCS). Variations were observed in five hands, four of right side and one of left side. Maximum tendon slips identified of Extensor Digitorum Communis were 7 in number in one right side hand. In no hand Extensor Digitorum Communis was found with less than four slips.

Conclusion: Complete knowledge of variations in extensor tendons of the hand is very important during reconstructive surgeries and other procedures in treating hand injuries. The findings of the present study may be of use during surgical procedures involving the tendon of Extensor Digitorum Communis.

Keywords: Extensor Digitorum , Tendinous slip, Dorsum of hand.

INTRODUCTION:

The complexity and intricacy of hand function are reflected by the anatomy. Extensor muscles have a relatively consistent architecture but also have notable anatomic variations of their tendons.¹ A detailed knowledge of the extensor tendons anatomy is essential for understanding the consequences of tendon injury at various levels. This tendon injury may be either due to external trauma or spontaneous rupture as in patients with rheumatoid arthritis and distal radioulnar joint osteoarthritis.² The tendons of the Extensor Digitorum Communis (EDC) are frequently injured in hand trauma. Dislocation and spontaneous rupture can also occur during the course of wrist osteoarthritis and
OBSERVATIONS:

In present study out of hundred upper limbs, four slips of Extensor Digitorum Communis were seen in 95 specimens, i.e., one each for index finger (EDCI), middle finger (EDCL), ring finger (EDCR) and little finger (EDCS). Variations were found in other five hands, four of right side and one of left side. Two right hands showed five slips, one each for index finger (EDCI), middle finger (EDCL), ring finger (EDCR) and two for little finger (EDCS) (Fig. 1&2). Six slips were found in one specimen on both sides, one for index finger (EDCI), two for middle finger (EDCL), two for ring finger (EDCR) and one for little finger (EDCS) (Fig. 3). Maximum number of slips, 7 in number were observed in Extensor Digitorum Communis of right hand, i.e., one for index finger (EDCI), four for middle finger (EDCL), two for ring finger (EDCR) and none for little finger (EDCS) (Fig. 4). In none of the hands, Extensor Digitorum Communis was found with less than four slips. (Table.1)

TABLE -1: NUMBER OF TENDONS OF EDC OF HAND (N=50 IN EACH SIDE) IN PRESENT STUDY.

<table>
<thead>
<tr>
<th>Number of tendons of Extensor Digitorum Communis</th>
<th>Right</th>
<th>Left</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absent</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Single</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Two</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Three</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Four</td>
<td>46</td>
<td>49</td>
<td>95</td>
</tr>
<tr>
<td>Five</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Six</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Seven</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Eight</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tbody>
</table>
DISCUSSION:

Godwin and Ellis⁴ have studied the distribution of extensor tendons on the dorsum of the hand and observed each of the tendons of extensor digitorum (ED) is usually single, but those of the middle and ring fingers are occasionally multiple and the ED tendon of the little finger lies close to that of the ring finger, with which it may be fused, or it may be absent. They suggested that it may be undergoing evolutionary
reduction. Their finding was almost similar to present study except close association of EDCS to EDCR. In present study it was found close to extensor digit minimi tendon in two hands. Von Schroeder and Botte observed double or triple EDC - long tendon, a single or triple EDC-ring tendon and a single or double EDC - small tendon in 43 adult hands. Findings in present study were similar to their study except the percentage was less in our study. El-Badawi et al., have reported that Extensor digitorum often has multiple tendons for the middle and ring fingers. Its contribution to the little finger was found to be usually by a bifurcating tendon common with that of the ring finger. The index finger always received a single tendon. Their result was almost similar to present study. Zilber and Oberlin observed the pattern of distribution of tendons of extensor digitorum communis in 50 hands as follows:

The EDC provided one tendon to the index finger, one to the middle finger, two to the ring finger, and none to the little finger. In present study except one hand EDC provided one or two slips to little finger of almost all hands. Celik et al., dissected fifty-four adult hands and observed following distribution of pattern for extensor digitorum (ED): index- single tendon; middle - single tendon; ring - single tendon; little finger - absent. Their result was almost similar to present study except in our study all hands received EDCS to little finger. Dass et al., studied 98 specimens and observed, in 77% of the specimens the EDC distally had tendons to the middle three fingers (EDC index, EDC longus and EDC ring). The EDC tendon for little finger was present in only 34% of samples. Their result is almost close to observations of Zilber and Oberlin.

Abdel-Hamid et al., dissected ninety five upper limbs of adult cadavers and the variations in the extensor tendons of the fingers, both proximal and distal to the extensor retinaculum, and their mode of insertion were observed and the data obtained was analyzed. In the majority of specimens, extensor digitorum had no independent slip to the little finger similar to those by Zilber and Oberlin (Table 2).

### TABLE-2: SHOWS THE RESULTS OF PRESENT STUDY COMPARED WITH PREVIOUS STUDIES REGARDING THE NUMBER OF THE SLIPS (STRANDS) IN EXTENSOR DIGITORUM COMMUNIS.

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>EDC to Index Finger</td>
<td>Single</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>EDC to Middle Finger</td>
<td>Single</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>EDC to Ring Finger</td>
<td>Single</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>EDC to Little Finger</td>
<td>Single</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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**CONCLUSION:**

From our study we came in to a conclusion that, extensor digitorum communis of South Indian cadavers shows no less variability in the arrangement of tendons when compared to other studies. Absence of tendon was very rare. EDCI received single tendon. Single tendon was most common for EDCL and four tendons were rarely found. Double tendons were common for EDCR. Single tendon was most common for EDCR and double tendons were common but four tendons were rare.
REFERENCES:


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