

# Junctura Tendinae in the First Intermetacarpal Space: A Case Report

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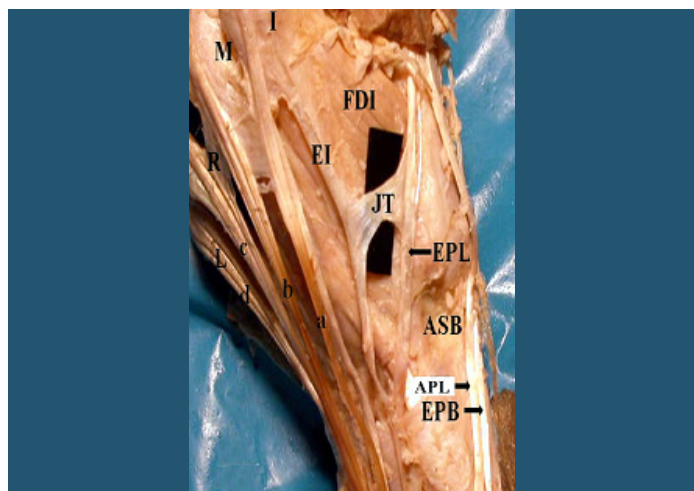
## ABSTRACT

The anatomy of extensor tendons and juncturae tendinum (JT) is of interest to both anatomists and surgeons. Understanding the structure of the JTs and the interactions between the tendons of the fingers is of utmost importance in hand assessment, especially during the reconstructive procedures such as tendon transfers. During routine dissection of extensor tendons of dorsum of hand there was a filamentous band between the tendon of extensor pollicis longus and extensor indices in the first intermetacarpal space. This band was identified as Juncturae tendinae of Type 1. It was attached to the extensor tendons on either side of the first intermetacarpal space in a transverse direction. The presence of Juncturae tendinae in the first intermetacarpal space is a rare variation. This variation is important as it interferes with independent motion of thumb and index finger and also in tendon repairs.

**Keywords:** Extensor pollicis longus, Extensor tendons, Hand, Thumb

## CASE REPORT

During anatomical dissection of an 85-year-old male cadaver for undergraduate demonstration in the Department of Anatomy, a variation was found in the 1<sup>st</sup> intermetacarpal space on the dorsum of the left hand. The extensor tendons of the 1<sup>st</sup> inter metacarpal (IMC) space were identified, cleaned and studied. There was a filamentous band between the tendon of extensor pollicis longus and extensor indices in the first IMC space. Morphologically the anomalous band confirmed to the description of Type 1 Juncturae Tendinae (JT) characterized by presence of filamentous regions within the intertendinous fascia [Table/Fig-1]. The JT were also present in the other IMC passing in a distal direction from middle finger to index finger and from ring finger to middle and little fingers. The length and the width of the JT in the first IMC were 9.2 mm and 11.5 mm respectively. The length of the JT was a measurement of the intertendinous distance along the middle of the JT. The width was measured as the average distance of the JT perpendicular to the length.



**[Table/Fig-1]:** Radial (Lateral) view of Left hand showing Type 1 Juncturae tendinae(JT) between the tendons of EI (Extensor indices) and EPL (Extensor pollicis longus). EPB – Extensor Pollicis Brevis, APL-Abductor Pollicis longus, EPL-Extensor Pollicis Longus, EI-Extensor indicis, ASB-Anatomical snuff box, FDI- First dorsal interossei, a,b,c,d - Tendons of extensor digitorum communis to Index(I), middle(M), Ring(R)and Little (L)finger respectively

## DISCUSSION

Because of the complex mechanisms involved in the actions of the long extensor muscle tendons, complete independent extension of each finger is difficult. This is in part attributable to the ' junctura tendinum' and 'intertendinous fascia' between the long extensor tendons on the dorsum of the hand [1-3]. JT have been described in the second, third and fourth intermetacarpal (IMC) spaces. Several anatomical studies have dealt with the location and course of the JTs of the dorsum of the hand in detail with reference to their relations to the extensor tendons and also histological analysis [4-6]. The presence of JT in the first intermetacarpal space is rare and the existence of it would limit the movements of thumb and index finger. Morphologically three distinct types of JT associated with extensor tendons have been identified in the previous studies [1,6]: Type 1 JT characterized by filamentous regions within the intertendinous fascia that is attached to the extensor tendons on either side of the IMC space. Much thicker and well-defined connecting bands are classified as Type 2. Type 3 is characterized by tendon slips from the extensor tendons and this type is subclassified into "y" or "r" subtypes depending on shape. The frequency of occurrence of the JT types as reported in the study by Von Schroeder et al., is as follows: The type 1 was found in 57.4% of the cases in the second IMC and in 16.7% of the cases in the third IMC. The type 2 was observed in 3.7% of the cases in the second IMC and in 59.3% of the cases in the third IMC space [1]. Pinar et al., found the type 3y in 14.8% JT in the third IMC space and 53.7% JT in the fourth space [6]. The type of 3r was observed in 5.55% of the cases in the third IMC and in 37% of the cases in the fourth IMC space in their study [6]. The JT are known to occur in all the IMC spaces except the first IMC. The rare occurrence of supernumerary extensor tendons inserting to thumb and index have been reported in the literature [2,6]. During a surgical procedure Steichen and Peterson accidentally found the presence of JT between the tendon of extensor digitorum communis of the index finger and extensor pollicis longus [7]. Though Steichen and Peterson have not commented about the type of JT, it can be identified as type 3 or type 4 junctura tendinum from the figure shown in their report

[7]. In the present case junctura tendinium was a type 1 filamentous band contrary to the tendinous connection described in the above study. Komiyama et al., have reported anomalous interconnections between extensor pollicis longus and extensor indicis proprius tendons [8]. The reason attributed to the interconnection between the extensor pollicis longus and the tendon of the extensor indicis proprius is that both the extensor pollicis longus and extensor indicis proprius are phylogenetically detached parts of extensor digitorum profundus which is a member of ante-brachial manual group. The medial component of Extensor Digitorum Profundus develops into Extensor Indicis Proprius and the lateral component becomes Extensor Pollicis Longus [2,7]. The reason attributed for the absence of Juncturae Tendinae in the 1<sup>st</sup> metacarpal space is the advantage in the independence of index finger motion which also is aided by the first dorsal interosseous and the lumbrical to the index finger which has a single origin from the flexor digitorum profundus tendon [1]. During the process of evolution of opposition and prehensile action of the thumb, probably the JT in the first IMC space regressed to allow the independent motion of the thumb. So, the anomalous presence of Junctura Tendineum in the first intermetacarpal space will interfere with independent movements of thumb and index finger.

## CONCLUSION

Understanding of the structure of the JTs and the interactions between the tendons of the fingers is of utmost importance during the reconstructive procedures such as tendon transfer. The presence of JT type 1 in the first IMC space is rare. This variation could be of importance for surgeons during assessment of movement of thumb and tendon repairs of thumb and index finger.

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