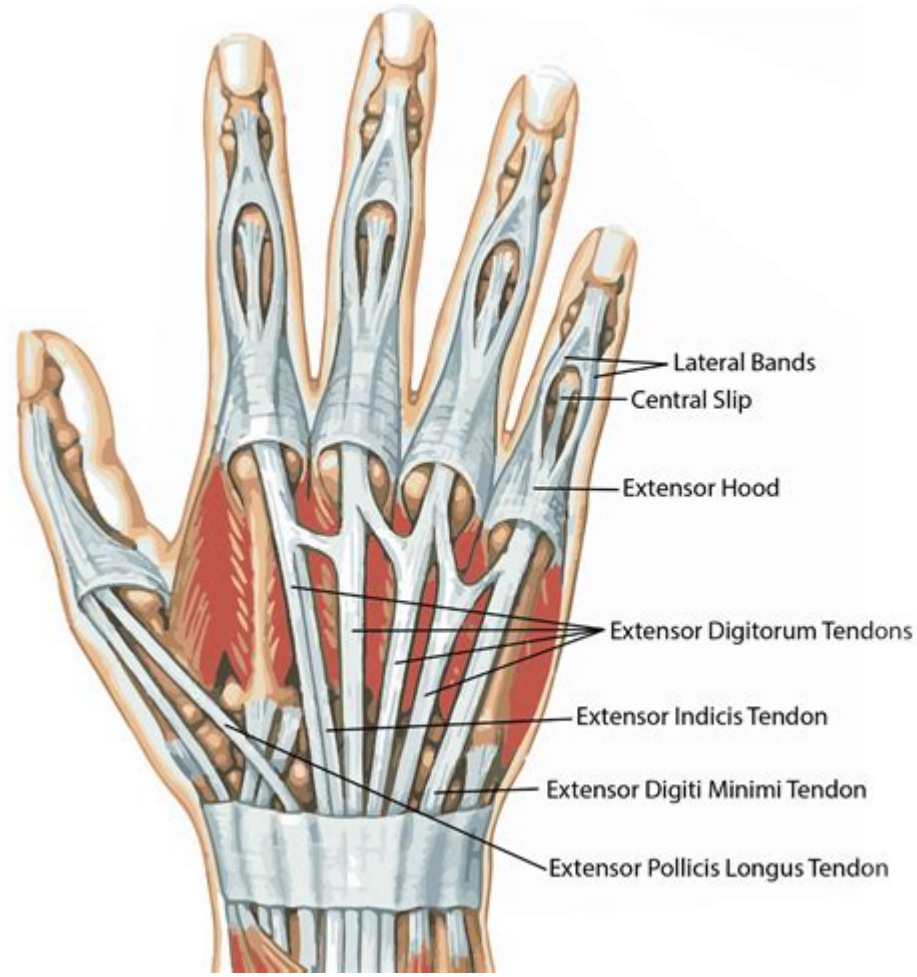
Finger Extensor Tendon Anatomy



Finger extensor tendon anatomy is a critical component of the hand's musculoskeletal system, allowing for the extension and movement of the fingers. These tendons play a vital role in hand function, enabling activities such as gripping, typing, and various intricate tasks that require fine motor skills. This article will explore the anatomy of finger extensor tendons, their functions, clinical significance, and common injuries associated with these tendons.

Overview of Finger Extensor Tendons

Finger extensor tendons are specialized fibrous structures that connect the muscles of the forearm to the bones of the fingers. They facilitate the extension of the fingers at the metacarpophalangeal (MCP) joints, proximal interphalangeal (PIP) joints, and distal interphalangeal (DIP) joints. The tendons are formed from a combination of collagen fibers, providing strength and flexibility, and they are covered by synovial sheaths that reduce friction as the tendons glide over the surrounding structures.

Anatomy of the Extensor Tendons

The extensor tendons of the fingers primarily originate from the muscles located in the posterior

compartment of the forearm. The main extensor muscles contributing to finger extension include:

1. Extensor Digitorum (ED): The primary muscle responsible for extending the fingers.
2. Extensor Indicis (EI): This muscle extends the index finger independently of the other fingers.
3. Extensor Digiti Minimi (EDM): This muscle extends the little finger.
4. Extensor Pollicis Longus (EPL): Although primarily responsible for thumb extension, its action can influence the position of the fingers.
5. Extensor Pollicis Brevis (EPB): Also involved in thumb extension but plays a minor role in finger movements.

Course of the Extensor Tendons

The course of the finger extensor tendons can be divided into several segments:

1. Forearm: The tendons originate from their respective muscles in the forearm and travel distally.
2. Wrist: As the tendons pass through the wrist, they enter the extensor retinaculum—a fibrous sheath that holds the tendons in place and prevents bowstringing.
3. Dorsal Hand: After passing through the wrist, the tendons fan out over the dorsal surface of the hand.
4. Fingers: The tendons then split into three parts as they reach the fingers:
- Central Slip: This part inserts into the base of the middle phalanx.
- Lateral Bands: These structures diverge from the central slip and insert into the distal phalanx.

Functional Anatomy

The extensor tendons are crucial for the coordinated movement of the fingers. Their primary functions include:

1. Extension of the Fingers: The extensor tendons allow for the straightening of the fingers, which is essential for grasping and releasing objects.
2. Fine Motor Skills: The intricate movements of the fingers, such as typing or playing instruments, rely on the precise functioning of the extensor tendons.
3. Stabilization of the Hand: The extensor tendons work in conjunction with flexor tendons to stabilize the hand during various activities.

Biomechanics of Finger Extension

The biomechanics of finger extension involves a complex interplay between the extensor tendons and the joints of the fingers. Key points include:

- The metacarpophalangeal (MCP) joint is the primary joint involved in finger extension, with the extensor tendons serving to extend this joint while also influencing the PIP and DIP joints.
- When the extensor digitorum contracts, it causes simultaneous extension at all three finger joints through the central slip and lateral bands.
- The intrinsic muscles of the hand, such as the interossei and lumbricals, assist in coordinating

movements and stabilizing the fingers during extension.

Clinical Significance

Understanding finger extensor tendon anatomy is crucial for diagnosing and treating various conditions and injuries. Common clinical concerns include:

1. Tendon Injuries:
- Rupture: A complete or partial tear of the extensor tendon can occur due to trauma or overuse, leading to a loss of finger extension.
- Lacerations: Cuts that sever the tendon can impair function and require surgical intervention.

2. Tendonitis: Inflammation of the extensor tendons can result from repetitive motion or overuse, causing pain and limited mobility.

3. Dupuytren's Contracture: This condition involves the thickening of the palmar fascia, which can affect the extension of the fingers, especially when the flexor tendons are involved.

4. Extensor Tendon Repairs: Surgical repair of ruptured or lacerated extensor tendons is common, and rehabilitation is often required to restore function and strength.

Diagnosis and Treatment

Diagnosing extensor tendon injuries typically involves:

- Physical Examination: Clinicians assess the range of motion, strength, and any visible deformities in the fingers.
- Imaging Studies: X-rays or MRIs may be used to evaluate the extent of injuries and rule out associated fractures.

Treatment options vary based on the severity of the injury:

1. Conservative Management:
- Rest and Immobilization: Splinting the affected finger to prevent further damage.
- Physical Therapy: Exercises to improve strength and range of motion.

2. Surgical Intervention:
- Tendon Repair: In cases of complete rupture or laceration, surgical repair may be necessary.
- Rehabilitation: Post-surgical rehabilitation is crucial for restoring function and preventing stiffness.

Conclusion

The anatomy of finger extensor tendons is complex yet essential for hand function. Understanding their structure, course, and biomechanical role illuminates their significance in both everyday activities and clinical scenarios. With the potential for injury and the implications for rehabilitation,

knowledge of finger extensor tendon anatomy is vital for healthcare professionals and individuals engaged in activities that require dexterity and fine motor skills. By appreciating these intricate aspects, we can better support the health and functionality of our hands.

Frequently Asked Questions

What are the main functions of the finger extensor tendons?

The main functions of the finger extensor tendons are to facilitate the extension of the fingers at the metacarpophalangeal and interphalangeal joints, allowing for movements such as grasping, pointing, and other fine motor skills.

What is the anatomical pathway of the finger extensor tendons?

The finger extensor tendons originate from the extensor muscles in the forearm, pass over the wrist through the extensor retinaculum, and then extend into the fingers, where they divide into a central slip and two lateral bands that insert on the distal phalanx.

How do the extensor tendons of the fingers differ from the flexor tendons?

Extensor tendons are responsible for extending the fingers and are located on the dorsal side of the hand, while flexor tendons are located on the palmar side and are responsible for flexing the fingers. Additionally, extensor tendons traverse the wrist in a more superficial manner compared to flexor tendons, which are protected by the carpal tunnel.

What role do the extensor expansion and dorsal hood play in finger movement?

The extensor expansion, also known as the dorsal hood, is a fibrous structure that covers the proximal phalanx and serves as an attachment point for the extensor tendons. It allows for coordinated extension of the fingers and distributes the force of the extensor tendons across multiple joints.

What are common injuries associated with finger extensor tendons?

Common injuries include lacerations, ruptures, and conditions like mallet finger, where the distal phalanx cannot be straightened due to a rupture of the extensor tendon. These injuries can result from trauma, sports activities, or repetitive strain.

How can one assess the integrity of the finger extensor tendons?

The integrity of the finger extensor tendons can be assessed through physical examination techniques, such as observing the ability to extend the fingers fully, testing for pain or tenderness along the tendon pathways, and performing specific tests like the Bunnell test for mallet finger.

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而 finger 不同，finger 的 g 位于词中，是一个不可分割的整体，所以没有经历 NG-coalescence 的变化，仍然保留着 /ˈfɪ ŋg ə/ 的读音。没有受到影响的词还有 angle, English, linger 等。当然，现代还有一些方言，也没有经历 NG-coalescence，singer 和 finger 仍然押韵。

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