Evaluation and Treatment of Jersey Finger and Pulley Injuries in Athletes

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KEYWORDS

• Flexor tendon system • Flexor digitorum profundus • Jersey finger • Pulley injuries

KEY POINTS

- Early identification and prompt diagnosis of flexor tendon ruptures allow appropriate surgical repair of the tendon. Type I injuries require repair within 7 to 10 days.
- Flexor digitorum profundus tendon rupture can be diagnosed by clinical examination alone, but MRI and/or ultrasound can aid in confirming the diagnosis.
- Pulley reconstruction can be done using either looped or nonencircling techniques. Although biomechanical testing suggests the looped techniques are stronger, the clinic relevance of this point remains unclear.

ZONE I FLEXOR DIGITORUM PROFUNDUS TENDON AVULSION—JERSEY FINGER

The most common type of closed flexor tendon injury in the finger is an avulsion of the flexor digitorum profundus (FDP) at its insertion into the distal phalanx.[1] The typical athlete is involved in football, flag football, or rugby, although it can be seen in other sports. The injury occurs with forced extension of the finger against maximum flexion, such as when a player is attempting to tackle or grab another player and gets caught in their jersey. The term "rugger jersey" or "jersey" finger originated with this injury.

Anatomy and Mechanism

After insertion of the flexor digitorum superficialis (FDS), the FDP tendon continues to travel within the digital sheath alone. Now in what is considered zone I, the tendon inserts into the base of the distal phalanx. The blood supply to the tendon is partially supported by a vincular system along its dorsal aspect. This system comprises a longus and brevis vincula. The longus and brevis vincula can remain intact or be ruptured, depending on the type of injury.

Injury to the FDP tendon usually occurs at the insertion into the bone at the base of the distal phalanx.[2] Although this can occur in any finger, by far the most common is injury to

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the ring finger. This injury has been estimated to be true in more than 75% of cases.[3] Several theories have been proposed to explain why this occurs. The ring finger becomes the most prominent and longest finger during grip.[4] Furthermore, the FDP tendon is partially tethered in the palm by bipennate lumbrical muscles on either side, yet it shares a common muscle belly with the middle and small fingers in the forearm.[5] Ultimately, it is unclear for the exact reason for the number of ring finger injuries as opposed to other finger injuries, but in an anatomic study by Manske and Lesker,[6] the load to failure of the ring finger was found to be significantly less than the middle finger.

These types of injuries can occur as a soft tissue–only avulsion, avulsion with a small bony piece, or avulsion with large intra-articular fracture into the distal interphalangeal joint (DIP). Depending on the injury type, the tendon can either remain caught within the pulley system of the finger or can retract all the way into the palm. The Leddy-Packer classification system is frequently used to describe the injury and help guide treatment (**Fig. 1**).[7,8]

Type I

The tendon is avulsed from its origin and the entire vincular system is disrupted. The tendon retracts all the way back into the palm. The tendon no longer receives nourishment via the vincular blood supply or from imbibition of fluid within the tendon sheath. The tendon will subsequently shorten and retract.

Type II

The tendon is avulsed and retracts, but is held approximately at the level of the proximal interphalangeal (PIP) joint and A3 pulley. The vinculum longus remains intact and

Fig. 1. Radiograph of the hand depicting a flexor tendon avulsion with bone fragment stuck in the flexor sheath and a large intra-articular fragment involving the DIP joint. The *arrows* demonstrate the fracture at the distal phalanx and the avulsed/retracted fragment.