Closed Partial Flexor Digitorum Profundus Rupture: An Unusual Cause of Pediatric Trigger Finger

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Abstract

Background: Trigger finger is a common condition, causing impaired gliding of the digital flexor tendons. Chronic inflammation is the usual cause, but acute trigger finger following partial tendon laceration has also been described. **Methods:** We describe the case of a four year old girl who presented with inability to flex her index finger. Operative exploration revealed a closed partial rupture of the flexor digitorum profundus tendon, catching on the A2 pulley and preventing normal tendon gliding. **Results:** Excision of the damaged section of tendon allowed normal gliding motion, and once the wound had healed the patient regained full painless motion. **Conclusion:** Acute trigger finger caused by partial flexor tendon injury is an uncommon but well-documented presentation. Surgical exploration not only confirms the diagnosis, but allows for excision of the damaged segment to return normal movement without compromising strength.

Keywords: tendon, trigger, rupture, pediatric, closed

A 4-year-old girl presented to the plastic surgical outpatients clinic with a 5-day history of inability to extend her left index finger. She was otherwise healthy, with no previous hand injury and no recent history of trauma, illness, or infection. Examination revealed a moderately swollen finger, predominantly over the proximal phalanx, with mild tenderness over the proximal phalanx. Active movement was greatly reduced in the index finger but normal in all other fingers. Passive extension of the index finger was limited by pain. Plain radiograph was normal, and ultrasonography showed a small amount of free fluid at the proximal interphalangeal joint (PIPJ) with intact flexor tendons. A diagnosis of acute trigger finger was made, and the patient was booked for an elective exploration and pulley release.

At operation, a Bruner incision was made from the metacarpophalangeal joint (MCPJ) to the distal interphalangeal joint (DIPJ). After division of the A1 and C1 pulleys, and the creation of a small window in the A2 and A3 pulleys, a partial rupture of the flexor digitorum profundus (FDP) tendon was seen (Figure 1). A proximally based flap of approximately 25% of the tendon cross-sectional area was bunched and preventing normal tendon gliding. The flexor digitorum superficialis (FDS) tendon was intact. The flap of FDP tendon was excised, and free movement of the flexor tendons was demonstrated with no further evidence of triggering. The excised section of tendon was sent for histopathological examination, and microbiological cultures of tendon and flexor sheath fluid were taken. The wound was closed with absorbable suture and dressed with a light bandage.

Figure 1. Intraoperative photograph demonstrating partial flexor digitorum profundus rupture.

Unrestricted movement of the fingers within the dressing was encouraged.

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Table 1. Reports of Trigger Finger Caused by Partial Tendon Injury.

Author	Patient age	Tendon involved	Site of entrapment	Cause
Janecki ⁷	60	FDS and FDP	A1 pulley	Puncture
	14	FDS	A1 pulley	Laceration
Bilos et al ¹	19	FDS	A1 pulley	Laceration
	18	FDS	A1 pulley	Laceration
Gordon ⁶	55	FDS	A1 pulley	Laceration
Schlenker et al ¹⁰	64	FPL	A1 pulley	Laceration
Frewin and Scheker ⁴	21	FDS	A2 pulley	Laceration
Takami et al ¹¹	26	FDS	A2 pulley	Hammer
Fujiwara ⁵	16	FDS	A1 pulley	Laceration
Tohyama et al ¹²	21	FDS	A1 pulley	Laceration
Okano et al ⁹	29	FDS	A1 pulley	Laceration
	31	FDS	A1 pulley	Laceration

Note. FDS = flexor digitorum superficialis; FDP = flexor digitorum profundus; FPL = flexor pollicis longus.

All histology showed normal tendon, and microbiological results were negative. The patient was followed-up for 4 weeks postoperatively and recovered full active and passive movement of the index finger.

Digital trigger finger, or stenosing tenosynovitis, is a common condition affecting the movement of the fingers. Most commonly, the condition presents in middle-aged women, and is due to progressive intratendinous swelling following repetitive angular load at the proximal edge of the A1 pulley, with reactive inflammation of the pulley.¹³ In the pediatric population, congenital trigger finger most commonly affects the thumb and the tendinous swelling is idiopathic.¹³ Case and Leslie² described a case of an infant with trigger finger due to a thickened A2 pulley following PIPJ dislocation.

Trigger finger caused by partial rupture of a flexor tendon, which subsequently “bunches” at the proximal end of the fibrous tendon sheath, is a much rarer condition. To our knowledge, there are only 11 previously reported cases of acute partial tendon injury causing trigger finger, with 10 of these following open injury (Table 1). Takami et al¹¹ report a case of trigger finger caused by closed partial FDP rupture following a direct blow to the finger from a hammer. Although similar, our case is unique due to its occurrence in the pediatric population, as well as the lack of any known preceding trauma.

Excision of the injured tendon segment, with pulley release to account for the postinjury inflammation, resolved the size mismatch between tendon and sheath and allowed return of normal tendon gliding. Evidence exists that partial injuries of the flexor tendons (varying from 25% to 40% of the cross-sectional area) can be successfully treated by trimming, with no loss of tensile strength compared with primary repair.^{3,8}

Ethical Approval

This study was approved by our institutional review board.

Statement of Human and Animal Rights

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008.

Statement of Informed Consent

Informed consent was obtained from all individual participants included in the study. No identifying information is included in the article.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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