

CASE REPORT

Simultaneous Dorsal Base Fracture and FDP Avulsion of Distal Phalanx of the Little Finger

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*Research performed at Shohada Teaching Hospital, Tabriz University of Medical Sciences, Tabriz, Iran**Received: 5 September 2013**Accepted: 30 November 2013***Abstract**

Avulsion injury of the flexor digitorum profundus (FDP) with concomitant fracture of the distal phalanx dorsal base is uncommon. Simultaneous avulsion fractures of the insertion of this tendon associated with rupture of the tendon from the bony fragment and combination with dorsal base fracture is very rare and also complicated. A 36-year-old man fell and injured his right little finger. FDP avulsion with simultaneous dorsal base fracture (containing extensor tendon insertion) was detected. Our surgical repair by a single midlateral incision the avulsed fragment was replaced on the palmar base of the distal phalanx and successfully immobilized with 1.5 mm screw. After three months, patient had 20 degrees range of motion in the DIP joint. The digit was pain free and also relatively functional. It seems that FDP avulsion classification need to be extended and include this uncommon type as described in this case report for better management of these uncommon type.

Keywords: Dorsal Base Fracture, FDP avulsion, Phalanx**Introduction**

Avulsion of the flexor digitorum profundus tendon is a well-known injury (1, 2). There are few reports of FDP avulsion associated with distal phalanx fracture (3, 4, 5). Leddy and Packer proposed a classification of these injuries into three types (6,7). An extension of the mentioned classification system has been suggested by Smith in 1981 (5). The designated Type 4 variety consists of an intra-articular fracture of distal phalanx, associated with tendon avulsion from the fragment in addition to the subsequent retraction of tendon (8). Flexor digitorum profundus avulsion with concomitant and separated fracture of the distal phalanx dorsal base fracture is basically an uncommon injury. We therefore intend to present a case of such an injury.

Case History

A 36-year-old man fell and his right fifth finger injured. He was referred to our emergency department due to pain and swelling. On examination the day after injury there was marked swelling and echymosis of fifth finger.

The DIP joint was in 15° flexion and there was no active flexion and no active extension of DIP joint. The sensation was normal in addition to the intact nail and nail

bed. Roentgenograms revealed a bone fragment arising from the palmar aspect plus large bone fragment arising from the dorsal aspect of the base of distal phalanx (Figure 1 A, B).

After radiographic and physical examination the diagnosis of FDP avulsion with simultaneous dorsal base fracture (containing extensor tendon insertion) was performed.

Surgical exploration revealed complete avulsion of flexor digitorum profundus from its insertion with large bone fragment and intra-articular dorsal base fracture of distal phalanx containing extensor tendon insertion. By a single midlateral incision the avulsed fragment was replaced on the palmar base of the distal phalanx and immobilized with 1.5 mm screw (Figure 2 A, B).

For dorsal base fracture, similar approach was followed and a pullout suture was woven through the extensor tendon, passed through distal phalanx fracture site, and tied over the button on the volar aspect of distal phalanx. After four weeks of immobilization the pullout suture was removed and active range of motion exercises was started. Following a three month period, the patient had 20 degree range of motion in DIP joint. It was confirmed that the digit was pain free and functional.

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Figure 1 A, B. Lateral (left) and AP (right) radiography of the fifth finger.



Figure 2 A, B. Lateral (right) and AP (left) radiography after open reduction and fixation by screw.

Discussion

There are few reports of FDP avulsion associated with fracture of distal phalanx. Avulsions of FDP tendon insertion is classified into three types. In type 1, the tendon avulses cleanly from the distal phalanx with disruption of both vincula. In type 2, the most common variety, the tendon retracts to the level of proximal interphalangeal joint with disruption of vincula brevia, excluding the lunatum. The tendon may contain a small fleck of bone. In type 3, the least common variety, a large bone fragment is attached to the tendon. The tendon retracts to the distal interphalangeal joint level but further retraction prevented by the distal pulley (7). Prompt recognition and surgical repair of FDP avulsions are critical in obtaining optimal return of function of DIP joint and avoiding permanent shortening and retraction of the tendon (8). Another authors believed that operative restoration of the injured structures is a necessity in order to achieve a good functional outcome (9, 10).

Smith in 1981 reported a case in which there was unstable intra-articular fracture of distal phalanx and also FDP tendon was found lying at the base of the proximal phalanx (5). Moreover, Busemi and Page presented a FDP avulsion with a separate and concomitant intra-articu-

lar fracture of distal phalanx (2). In the report of Ehlert *et al* stabilization of the distal interphalangeal joint is necessary even at the expense of early motion (11).

In the abovementioned reports, avulsion of the FDP occurs when the finger extend during the maximum contraction of profundus muscle (6). In our patient falling with hyperextension of the fifth finger produced such lesion. The fracture, accompanied with FDP avulsion has been further divided into intra-articular and extra-articular types (3).

When there is an associated fracture of distal phalanx, the fracture may obscure the diagnosis of avulsed tendon (12). Careful physical examination of acute injury is crucial to prevent a delay in diagnosis. It seems that FDP avulsion classification need to be extended and include this uncommon type as described in this case report for the better management of such uncommon injuries.

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