



CASE REPORT

Comminuted fracture of distal phalanx complicated by flexor digitorum avulsion

Ahmadreza Afshar*

Orthopedic Department, Urmieh University of Medical Sciences, Shahid Motahary Hospital, Kashani Street, Urmieh, West Azerbaijan, Iran

Accepted 8 August 2005

Introduction

Avulsion of the flexor digitorum profundus (FDP) tendon insertion is a well-known injury in athletes. There are few reports of FDP avulsion associated with a fracture.^{1,2,5} I report a case of comminuted fracture of the distal phalanx complicated by FDP avulsion.

Case history

A 46-year-old man trapped his right ring finger while at his workplace, crushing the distal phalanx. Three days post-injury he was referred due to a very tender, swollen, bruised distal phalanx. The nail and nail bed were intact, his sensation was impaired. The diagnosis, based on physical and X-ray examination, was a comminuted fracture with soft tissue injury to the volar surface and pulp (Fig. 1). Under ring block anesthetic he was unable to flex the distal inter-phalangeal (DIP) joint. X-ray confirmed the fracture line extended to the DIP joint and the volar intra-articular fragment was displaced and comprised 50% articular surface (Fig. 2). Because of the poor condition of the soft tissues, his surgery was deferred for three weeks. By

using a volar Bruner incision over the distal and middle phalanges, the fracture site was approached. The avulsed fragment was reduced and fixed with a 2 mm screw (Fig. 3). The joint surface was then checked by X-ray.

The limb was immobilised in a splint with the wrist flexed 30°, the metacarpophalangeal joints flexed at approximately 70°, and the interphalangeal joints maintained in extension. A dynamic rubber band was instituted on the second post-operative day and maintained for four weeks. At 6 months the range of motion of the DIP joint was 10–45°, without pain. There was normal sensation and no nail deformity.

Discussion

Avulsion of the FDP tendon insertion has been classified into three types on the basis of retraction of the FDP: type I, the tendon retracts into the palm with rupture of both vincula; type II, the tendon retracts to the level of the proximal interphalangeal joint leaving the long vinculum and its blood supply intact; type III, there is a large bony fragment retained by the tendon. This is the rarest type.⁴

Smith⁵ described a case in which there was unstable intra-articular fracture of the distal phalanx and the FDP tendon was found lying at the base

* Tel.: +98 912 3131556; fax: +98 441 2234125.
E-mail address: afshar@umsu.ac.ir.



Figure 1 Comminuted fracture of distal phalanx (AP view).



Figure 2 Comminuted intra-articular fracture plus FDP avulsion (lateral view).

of the proximal phalanx. Buscemi and Page² presented an FDP avulsion with a separate and concomitant intra-articular fracture of the distal phalanx. The fracture, accompanied with the FDP avulsion has been further divided into intra-articular and extra-articular types.¹

In the above-mentioned reports, avulsion of the profundus tendon insertion occurs when the finger is forcibly extended during a maximum contraction of



Figure 3 Fixation of avulsed fragment with 2 mm screw.

the profundus muscle.³ In this patient, a crush injury with severe soft tissue damage produced the lesion.

The comminuted fracture may mask the diagnosis of FDP avulsion, unless one is aware of the possibility and tests for active flexion at the DIP joint.

The object of FDP avulsion classification is its effect on the treatment and the time of surgery, as the presence of such fractures affects the management of the FDP avulsion. It seems that FDP avulsion classification needs to be extended and include these uncommon types. Also, it should be considered as a possible complication in comminuted fractures of distal phalanx.

References

1. Al-qattan. Type 5 avulsion of the insertion of the flexor digitorum profundus tendon. *J Hand Surg (Br)* 2001;26-B(5): 427–31.
2. Buscemi MJ, Page BJ. Flexor digitorum profundus avulsions with associated distal phalanx fractures. A report of four cases and review of the literature. *Am J Sport Med* 1987;15(4): 366–70.
3. Leddy JP. Avulsion of the flexor digitorum profundus. *Hand Clin* 1985;1(1):77–83.
4. Leddy JP, Packer JW. Avulsion of the profundus tendon insertion in athletes. *J Hand Surg* 1977;2(1):66–9.
5. Smith JH. Avulsion of a profundus tendon with simultaneous intra-articular fracture of the distal phalanx—case report. *J Hand Surg* 1981;6(6):600–1.