



Flexor Digitorum Profundus Injury in a Newborn: A Case Report

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Abstract

Injuries of flexor digitorum profundus tendons in children are rare, certainly in newborns. In this case report, we discuss the presentation, treatment and outcome of a profundus tendon injury of the fifth finger of a ten days old baby. The tendon injury in this case was caused by a knife cut, unrelated to cesarean section. To our knowledge, this is the first report about a flexor digitorum profundus injury and repair in a newborn of this age.

Key Words: Newborn, flexor digitorum profundus tendon injury

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Introduction

Because of its extensive use in daily life activities, the hand is very susceptible for injuries. Hand injuries account for 14% to 30% of all treated patients in emergency care. Most injuries of the hand are open injuries, not uncommon accompanied with tendon lesions. Flexor digitorum profundus (FDP) lesions are thus common pathology in orthopedic services [1]. However in children flexor tendon injuries are rare. When these injuries do occur at children's age, the peak incidence is at the age of three years and the main etiology is cut by glass [2]. Some studies suggest more satisfactory functional results of primary flexor tendon repairs in children in comparison with adults [3]. However, in the very young, there is some great variance in results and reports of flexor tendon injuries of newborns are missing [3]. In this case we discuss the operative technique and outcome of a surgical FDP reattachment in a 19 days old male newborn.

The Case

In this case, a ten days old baby suffered an iatrogenic cut at the base of the third phalanx (zone 1) when a vascular access was removed. Close inspection and clinical examination of the hand confirmed the clinical diagnosis of a full flexor digitorum profundus tendon tear. The resting position of the fifth finger was in extension and active flexure of the distal interphalangeal joint (DIP) could not be observed (Fig 1.a). At that moment the newborn was staying at the intensive care unit because of respiration problems and a surgical intervention was not possible. When the newborn was dismissed nine days later, surgical exploration repair of the FDP tendon was performed.

Under general anesthesia; tourniquet was applied. Bruner zigzag incision was made from zone 1 to zone 3 in the fifth finger (distal phalanx to mid palmar) under loop magnification. Subcutaneous tissue was dissected and the proximal end of FDP tendon was 37 retracted at the level of zone 3 (Fig 1.b). The flexor digitorum superficialis (FDS) tendon and other structures were intact. The proximal part of the tendon was attached to a nasogastric neleton tube and pulled distally beneath of the pulleys (Fig1.c). Tendon repair was performed by the modified Kessler technique, using 2.0 polidioxon suture under surgical microscopic magnification (Fig1.d). During the operation, all the pulleys remained intact, except for pulley

A4. However the integrity of this pulley was restored at the end of the operation. Skin was closed using absorbable 'Rapid' sutures.

A semicircular extensor splint was applied for three weeks to ensure free healing. Three weeks postoperative a slight active flexion of the distal phalanx could be observed, indicating a good healing (Fig1.e).

As there was a complete loss of active flexion in the DIP joint, a full rupture was most probable in this case and surgery was required. The modified Kessler technique with 2.0 Polidioksanon sutures was used. The operating surgeon in this case is has most experience with this technique and most authors state there is no difference in outcome after different tendon repair techniques or suture material in children [2].

According to literature, also the fact that there was a delay of 9 days between tendon rupture and surgical repair does not influence the final outcome [2]. However the aftercare program following a surgical flexor tendon repair is more controversial. In this case active and passive movement was impaired by a plaster cast for three weeks, afterwards full motion was immediately allowed.

Ordinary plaster immobilization was chosen, as in case of isolated profundus tendon repair, the results of immobilization for 3 or 4 weeks are similar to the results of an early passive motion program [3,4]. After four weeks, the immobilization by the plaster was ended, since immobilization for longer than 4 weeks results in an appreciable deterioration of function [3,4]. However this is contradicted in other studies which suggest no relation between length of immobilization and final outcome [2].

After 4 weeks full free motion was allowed, since gradual allowance of movement using an active motion therapy program in baby's is nearly impossible. However some suggest that 4 weeks of immobilization cannot guarantee strong enough healing for full motion. Nevertheless this is still a topic of discussion and an advantage of free motion is the fact that in case of rerupture an immediate diagnosis can be made. In case of longer (partial) immobilization, the differentiation between a rerupture and adhesions can be difficult.

Anyway the revalidation of the newborn in this case seemed to be very prosperous: after three weeks, active flexion of the DIP joint could already been seen and no complications were

present. This corresponds well with clinical studies reporting excellent regain of function after profundus repairs in zone I in children [4]. Surgical microscopic magnification is necessary because of caliber of tendons is very thin in this age group.

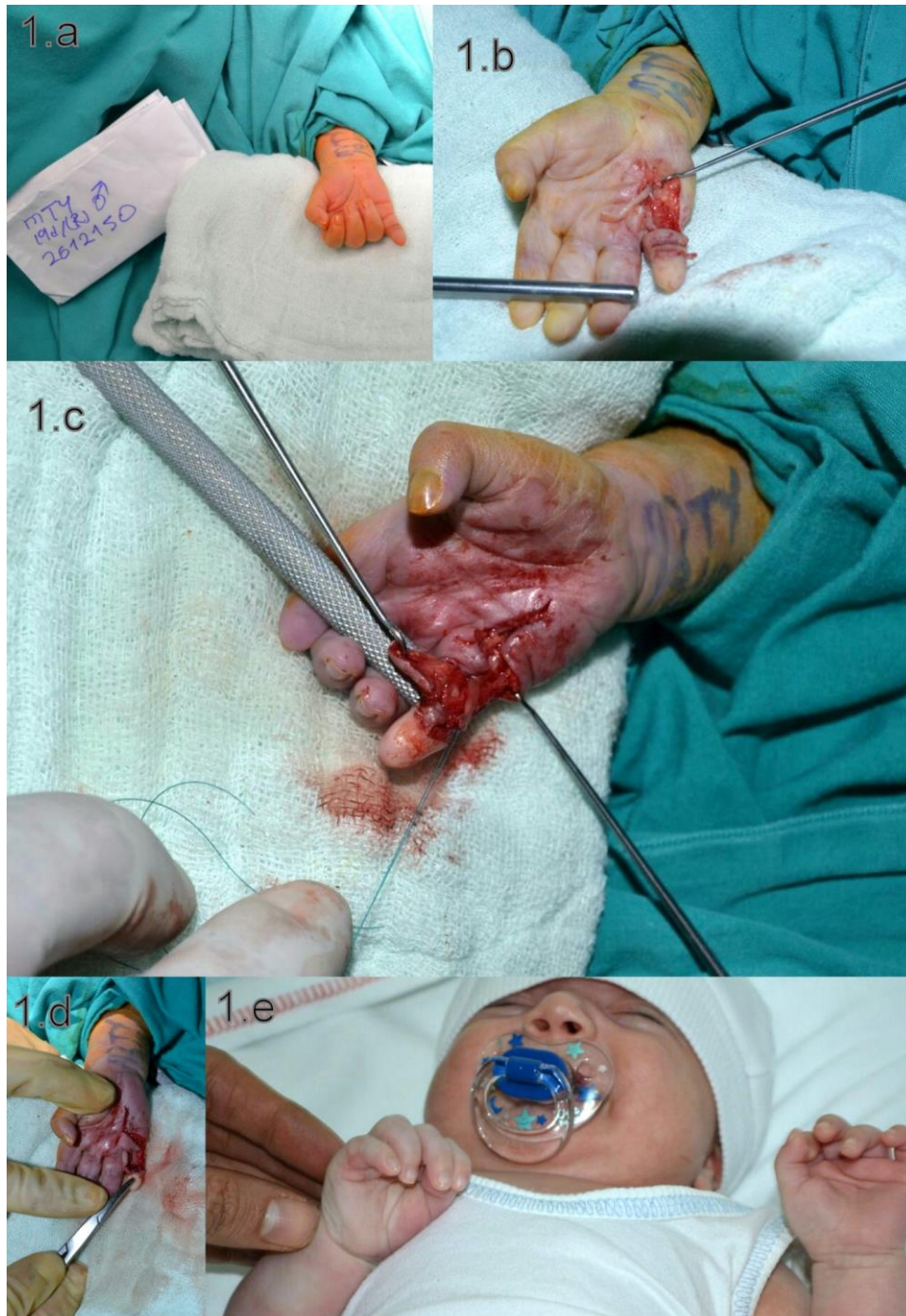


Figure 1. a: Preoperative illustration of patient's inability to flexion the distal interphalangeal joint of the fifth finger. **b:** The functional position of the hand at three months. **c:** The proximal stump FDP tendon was found at the level of zone 3. **d:** The tendon stump retrieved under A2-3 pulley by a nasogastric neleton tube. **e:** The view of repaired tendon by Modified Kessler Technique.

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