

Open Dislocated Interphalangeal Fracture of the Thumb in a 16-Year-Old Basketball Player

Hassan Zeddouk^{1*}, Yassine Saadi¹, Moncef Boufettal¹, Rida-Allah Bassir¹, Jalal Mekkaoui¹, Fekhaoui Mohammed reda¹, Mohammed Saleh Berrada¹, Mohammed Kharmaz¹

¹Orthopedic Surgery & Traumatology, University Mohamed V, Ibn Sina Hospital, Rabat, Morocco

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*Corresponding author: Hassan Zeddouk

Orthopedic Surgery & Traumatology, University Mohamed V, Ibn Sina Hospital, Rabat, Morocco

Abstract

Case Report

Phalangeal dislocation fractures of the hand are common in the sports world especially contact sports and ball sports. Open ones are less common. In this article we report a case of a 16-year-old young basketball player who injured her right thumb during a practice. Clinical and radiological examinations showed an open phalangeal dislocation fracture of the thumb. Management consisted of immediate reduction, abundant washing and finger splint for 4 weeks after X-rays showed anatomical reduction. Short, medium and long term clinical and radiological examinations showed good evolution. At our last follow up (1.5 years) our patient had regained full use of her hand in both daily and sporting activities. The purpose of this study is to encourage non operative treatment in dislocated fractured fingers when treated early if the initial external reduction is anatomical, and to show the need for further studies in similar cases in the sport world.

Keywords: Phalangeal Dislocation, Open Fracture, Sports, Antibiotics.

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INTRODUCTION

Phalangeal dislocation fractures of the hand are common in the sports world, especially hand sports. In a review published in 2008 about professional football injuries, it was stated that 24% of the injuries were finger injuries, and 49% of those were subluxations and dislocations [1]. It is frequent to consider finger injuries as minor which encourage some athletes to play through them, and here is where the physician's role is to recognize those who require a particular care and treatment [2]. Even if its treatment approach may seem simple, reality shows that it is not. Hand fractures are complicated by stiffness if overtreated, deformity if not treated and even both if poorly treated (as said by SWANSON).

CASE REPORT

A 16-year-old young girl with no previous medical or surgical history presented to the emergency room following a basketball practice incident that occurred on her right thumb. Upon inspection, the thumb was grossly deformed, our patient had an open interphalangeal dislocation (Fig 1). Thumb mobilization was impossible with a lot of pain. However, despite the

severity of the injury, the distal neurovascular examination was normal. X rays results showed a fracture of the head of the proximal phalanx associated with the interphalangeal dislocation (Fig 2). The patient was admitted 2 hours after the incident in the operation room. An antibiotic prophylaxis was injected (Amoxicillin / Clavulanic acid) prior to the reduction which was performed under a local anesthetic (thumb tendons were intact). Post reduction examination showed no sign of instability, then abundant washing with 0.9% sodium chloride was carried out before closure with 2 cutaneous stitches (Fig 3). Post Reduction radiographs showed an anatomic reduction of the dislocated interphalangeal fracture (Fig 4). Our patient was put under surveillance for about 2 hours after the procedure before clearing her out (skin coloration was good). A stack splint was put for 4 weeks, and our patient was advised to come to the ER if any sign of infection or discoloration of the skin appeared.

Follow up

We saw our patient 2 weeks after, and showed good wound healing, and radiographs showed no sign of fracture displacement. Upon 4 weeks after the incident, radiographs revealed a healing fracture and our patient

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started passive/active rehabilitation. Full range of motion with no pain was achieved upon 8 weeks, and 12 weeks after, a progressive individual return to her activity was allowed with no contact and protected initially with the

stack splint. On our last check up one and half a year after the incident, our patient had returned to her competitive activity and no limitation was noted during the process.



Figure 1: Clinical image of our patient's hand upon arrival



Figure 2: Radiography of the right hand showing the fracture dislocation of the thumb



Figure 3: Clinical image of the hand after reduction and suture of the skin opening



Figure 4: Radiography of the hand showing anatomical reduction

DISCUSSION

Phalangeal fractures are relatively common in contact sports soliciting hands; however, dislocated fractures are rarer and open dislocated fractures are even rarer. Dislocations of the distal interphalangeal joint can occur dorsally and, much less commonly, volarly. Open phalangeal dislocations are easily diagnosed as we can see the exit of the bone through the skin opening. X-rays are always necessary to identify an associated fracture or not. In both cases immediate reduction and thorough washing are necessary to avoid complications of both the dislocation and the skin opening such as infections. Preoperative X-rays are then used to ensure anatomical

reduction of the fracture, and based on them operative or nonoperative treatment are discussed. Even if these hand injuries are relatively common within the hand sports community, they remain poorly described in the literature.

Management and Timing of Operation

Open thumb fracture dislocations are rare but considered as both medical and surgical emergencies. The standard procedure, as for all the open fracture dislocations, is an administration of antibiotics, reduction and surgical debridement if necessary.

Early debridement is the gold standard treatment of all open fractures as it serves to decrease bacterial load and to remove foreign bodies to prevent infection. In our case the patient was admitted 2 hours post trauma, after a full-body evaluation and pre reduction radiographs. Nonoperative treatment using a hand-based (wrist free) thermoplastic splint demonstrated no tendon adhesion, contracture, infection, nonunion, or malunion [3].

Operative or Nonoperative Treatment

There are several techniques available for treating phalangeal fractures, such as buddy strapping, percutaneous cross Kirschner (K) wiring, plate fixation, and tension band wiring. Open transverse fractures of the phalanges typically need internal fixation. Nonoperative treatment using a hand-based (wrist free) thermoplastic splint demonstrated no tendon adhesion, contracture, infection, nonunion, or malunion [3].

However, in the case of open fractures, it's essential to minimize the number of implants used to reduce the risk of infections and sometimes we can opt for a nonoperative approach if the reduction is permitting it like with our patient. Lister introduced a method involving coronal interosseous wiring supplemented with oblique coronal K-wires for treating phalangeal fractures [4].

In our case, we adopted a nonoperative treatment for several reasons. First, our patient consulted early (2 hours post traumatic) which reduces the infection risk. Second factor is the skin opening was small as well as the fractured bone fragment.

And last, the post reduction X-rays showed an anatomical reduction.

It is essential to monitor the state of the scare weekly, to prevent any infection, and treat it as early as possible if noticed.

Another major key to the post treatment result is rehabilitation. If an operative treatment is adopted, a stable construct is required to enable early mobilization and prevent stiffness. In nonoperative cases, the rehabilitation is debuted as soon as bone consolidation on X-rays is noticed to avoid stiffness and regain all range of motion of the thumb (much needed for our patient regarding her sporting activity)

CONCLUSION

The treatment of open thumb fracture dislocations focuses mainly on avoiding infections, reducing the rate of complications, promoting bone healing and restoring the thumb functionality. We believe that this report and its literature review could be beneficial in the decision making for the treatment of open thumb fracture dislocations. Some controversies regarding the treatment approach remain on the table especially within athletes. Therefore, It is important to admit that higher-level research is to be made to shape comprehensive and simplified guidelines.

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