Hand Surgery and Rehabilitation xxx (2018) xxx–xxx

Available online at
ScienceDirect
www.sciencedirect.com

Elsevier Masson France
EM|consulte
www.em-consulte.com

Case report

Fracture-dislocation of the proximal interphalangeal joint of the long fingers: Report of an unusual case requiring open surgery

Fracture-luxation de l'articulation interphalangienne proximale des doigts longs : à propos d'un cas particulier rendant nécessaire l'abord chirurgical

C. Gengler [a,*], N. Pauchard [b]

[a] *Hôpital du Bocage, CHU Dijon Bourgogne, 2, boulevard du Maréchal-de-Lattre-de-Tassigny, BP 77908, 21079 Dijon cedex, France*
[b] *SOS mains, hôpital Privé Dijon Bourgogne, 22, avenue François-Giroud, 21000 Fontaine-lDijon, FranceFontaine-l*

ARTICLE INFO

Article history:
Received 4 October 2017
Received in revised form 12 December 2017
Accepted 16 January 2018
Available online xxx

Keywords:
PIP fracture
ORIF
Closed pinning
Flexor tendon incarceration

Mots clés :
Fracture de l'IPP
Réduction et ostéosynthèse à foyer ouvert
Ostéosynthèse percutanée
Incarcération des tendons fléchisseurs

ABSTRACT

Dorsal fracture-dislocations of the proximal interphalangeal (PIP) joint of the long fingers are in most cases unstable. They require surgery, whose primary aim is to restore and maintain articular congruency. While numerous techniques exist to treat these injuries, none have been shown to be superior to any of the others in terms of outcomes and complications. The least invasive techniques should be used as much as possible. We report here a rare case of incarceration of the flexor tendons in the PIP fracture which required open surgery.

RÉSUMÉ

Les fractures-luxations dorsales de l'articulation interphalangienne proximale (IPP) des doigts longs sont le plus souvent instables. Elles relèvent d'une prise en charge chirurgicale dont l'enjeu principal est le rétablissement et le maintien de la congruence articulaire. Il existe de nombreuses techniques pour traiter ces lésions, aucune n'ayant montré de supériorité par rapport aux autres en termes de résultat et de complication. Les techniques les moins invasives sont à privilégier autant que possible. Nous rapportons ici un cas rare de fracture-luxation dorsale de l'IPP ayant nécessité un abord chirurgical.

1. Introduction

In most cases, dorsal fracture–dislocations of the proximal interphalangeal (PIP) joint of the long fingers result from axial trauma on an extended finger. These fractures are generally unstable, particularly when a large proportion of the joint is affected and when the comminution is severe. They require surgical treatment [1,2]. The main goal of surgery is to restore and maintain articular congruency to limit complications such as joint instability, chronic pain, stiffness and loss of strength. Many surgical treatments are available to restore joint stability and all provide similar outcomes in terms of efficacy and complications. Factors that affect the treatment outcomes are not well known [3], no matter the technique chosen, and there is no consensus about how these injuries should be managed.

2. Case report

A 17-year-old, right-handed man, a smoker with no particular medical history, presented at the emergency room following direct trauma to the fourth finger at his workplace. The examination revealed ulnar clinodactyly of the finger. X-rays done on the day of

* Corresponding author. CHU Dijon Bourgogne, 2, boulevard du Maréchal-de-Lattre-de- Tassigny, BP 7708, 21079 Dijon cedex, France.
E-mail address: charline.gengler@hotmail.fr (C. Gengler).

https://doi.org/10.1016/j.hansur.2018.01.005
2468-1229/

Fig. 1. Preoperative radiographs: dorsal fracture–dislocation of the PIP with loss of articular congruency.

the injury showed a complex fracture of the base of the second phalanx with dorsal dislocation of P2 relative to P1 (Fig. 1). The fracture was immobilized in the emergency room and the patient was referred to the Hand emergency unit by his primary care physician on day 2 for subsequent care.

In the operating room on day 2, the fracture was reduced and fixation was achieved under regional anesthesia with a pneumatic tourniquet placed around the upper arm and inflated to 250 mmHg. Initially, we opted for the percutaneous treatment described by Vitale et al. [4] with reduction of the fracture by external manipulation and then stabilization with pinning of the closed fragment. After several attempts to reduce the fracture using Davier forceps under x-ray guidance, the reduction was deemed unsatisfactory (Fig. 2). Given that the fracture was comminuted and involved the joint, it was decided to perform open surgery and open anatomical reduction to limit the risk of painful sequelae and premature arthritis.

We used a volar Bruner-type incision [5]. The neurovascular bundles were isolated and moved to one side to avoid damage. Examination of the injury site revealed that the flexor sheath was lacerated and the A3 pulley ruptured. The flexor tendons were incarcerated in the fracture, which is why it was impossible to reduce the fracture externally (Fig. 3). The flexors, pushed to one side by the fragment, explained the ulnar clinodactyly of the finger. After releasing the flexors, we reduced the cartilage fragments and then the fracture using a temporary K-wire under x-ray guidance. The bone fragment was then secured with a 1.2 mm diameter screw and a mini-plate cut to form a curved washer that espoused the shape of the fragment and held it in place. Static and dynamic AP and lateral x-rays were done to check the stability of the

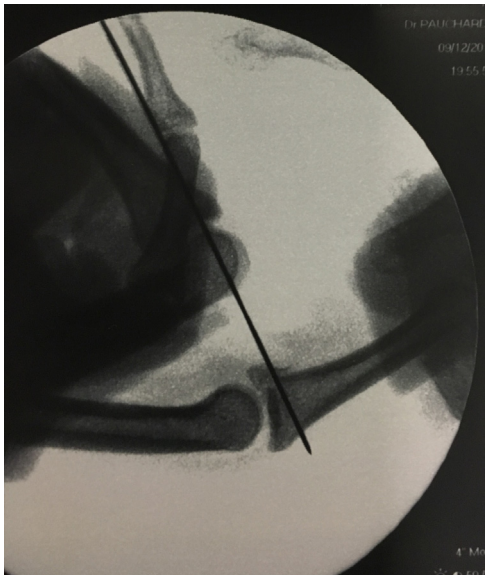

Fig. 2. Intraoperative fluoroscopy views: attempt at percutaneous pinning. The reduction obtained was not satisfactory as it was impossible to restore articular congruency. Persistence of rotation visible by fluoroscopy on the three-quarters view. The two bone fragments are not in contact.

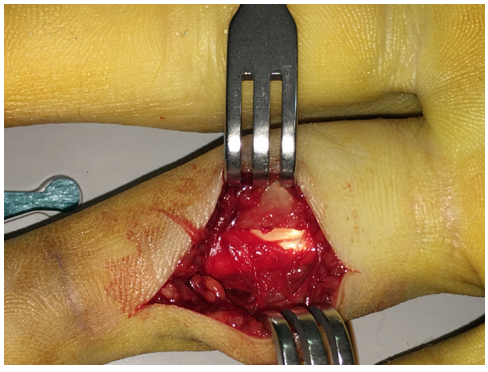

Fig. 3. Intraoperative imaging: incarceration of the flexor tendons within the fracture which made closed reduction impossible.

construct. The volar plate was sutured, as was the A3 pulley. The skin was closed with interrupted sutures. In the postoperative period, the hand was immobilized in a POP splint. The patient returned on day 3 after the surgery for a specialist consultation during which a thermoformed brace was placed in the intrinsic-plus position and used for 1 month. Self-rehabilitation consisted of gentle active and passive mobilization four times a day and was described to the patient at the first consultation.

The recovery required prolonged rehabilitation. At 4 months after the surgery, the patient no longer felt any pain; however, he had an active and passive flexion deficit of 25° despite the physical therapy and active flexion of 100° of the PIP (Fig. 4). Radiologically the joint was centered and congruency was satisfactory with no early signs of arthritic changes. The finger was perfectly straight in the AP and lateral views (Fig. 5).

3. Discussion

There are many surgical techniques to manage dorsal fracture–dislocations of the PIP. Various percutaneous methods have been proposed, such as placing a dynamic external fixator [6,7],

Please cite this article in press as: Gengler C, Pauchard N. Fracture-dislocation of the proximal interphalangeal joint of the long fingers: Report of an unusual case requiring open surgery. Hand Surg Rehab (2018), https://doi.org/10.1016/j.hansur.2018.01.005