Infrequently Encountered Multiple Displaced Proximal Phalangeal Fractures of the Hand: A Surgical Case Report

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Abstract

This case report describes a high energy injury to the hand that resulted in displaced transverse proximal phalangeal fractures of the 2nd, 3rd, and 4th fingers. Although single phalangeal fractures are frequently seen in clinical settings, multiple displaced fractures are encountered infrequently. A 30 year old male was seen in our clinic who had sustained a work related injury resulting in three transverse midshaft phalangeal fractures that were treated with closed reduction and percutaneous fixation, with two 0.10 mm K-wires retrograded through each fracture site. A one year follow-up revealed excellent fracture alignment, healing, range of motion, and cosmetic result. This case illustrates how it is possible to obtain an excellent surgical result in multiple displaced phalangeal fractures with Kirschner wires that are inexpensive and have been available to surgeons for decades.

Keywords: K-Wire fixation, Phalangeal fracture, Displaced fracture, Multiple fractures, Outcomes

Introduction

Proximal phalangeal fractures are frequently seen in hand injuries. However, multiple proximal phalangeal fractures are uncommon and they are the direct result of a high energy force. The prevalence of multiple phalangeal fractures in our hospital is estimated at roughly 3 cases each year but rarely multiple displaced fractures have been reported. The treatment depends on whether they are displaced, comminuted, compound, intraarticular, spiral, or avulsion injuries. Simple minimally displaced fractures are more likely to be treated non-operatively by external reduction and immobilization whereas; unstable fractures with a high risk of shortening, displacement, angulation and rotational deformity require reduction and surgical stabilization. Several options have been reported to treat these injuries such as plates, intramedullary screws, absorbable pins and Kirschner wire fixation. The objective of surgical treatment is to insure stability of the fracture with fixation and allow early mobilization of the fingers to achieve functional recovery as early as possible. The aim of our case report is to remind orthopedic surgeons of the simple operative option of intramedullary fixation with kirschner wires of the phalanges to establish stable fixation of the fracture site, while minimizing the potential for rotational displacement and allowing for early mobilization.

Case Report

We report on a 30 year-old male, Tunisian young man, without medical issues, referred to our department after a work accident with an entrapment of his left hand in a press paper machine. Physical examination revealed a deformity of the second, third and fourth digits which were malaligned, ecchymotic with a total swelling of his hand. No open wounds were observed. Radiographs showed angulated displaced mid shaft fractures of the second, third and fourth proximal phalanges (Figure 1). Under general anesthesia and fluoroscopy, a closed reduction was performed on each digit, with the fractures fixated with two intramedullary 0.20 K-wires retrograded through each phalangeal base and advanced distally to the head of the phalangeal bone. The procedure encompassed the introduction of two curved K-wires (diameter: 0.20) through the phalangeal base after a first opening of the medullary canal with another incurved K-wire, then the curved K-wire were advanced distally under fluoroscopy. The same procedure was repeated for the two others phalanges (Figure 2). Post operatively, the metacarpophalangeal and interphalangeal joints of each concerned finger were immobilized together with a plaster splint from the forearm to the distal interphalangeal joints.
much rigidity, it does allow for early mobilization, physiotherapy and simple, and in general, carries less risk of infection than an open hand by Hwa et al. and Gonzalez et al. [3,4]. This procedure is relatively bones has been described for more than five decades [2]. Furthermore, described by Foucher G [1] whereas intramedullary nailing of other proximal phalangeal fractures. The advantages are the preservation of soft tissue, including the extensor and flexor tendons [20]. The important advantage of this technique is the preservation of the soft tissue and most importantly the extensor tendons. It is important to not introduce the pins in either metacarpophalangeal or proximal interphalangeal joints to minimize loss of motion and increase the risk of scarring. We also recommend burying the ends of the wires to minimize the risk of sepsis.

Conclusion
Phalangeal fractures are typically treated non-operatively; however, surgery is indicated in unstable or displaced fractures. The case study presented here illustrates how it is possible to obtain excellent results in multiple displaced proximal phalangeal fractures in one hand, with proper fluoroscopy guided and correctly positioned kirschner wires. In addition to the excellent results, this method has a history of success and is very cost effective.

Reference


