

Open Infected Seymour Fracture

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One of the serious complications of Seymour fractures is infection. A 24-year-old male presented with the open infected distal phalanx fracture of the middle finger. Wound debridement, irrigation, use of antibiotics and external fixation with the aid of mini-Illizarov provided a resolution to the infectious process and enabled us to achieve a stable osseous union in correct position.

Keywords: *Seymour fracture, Distal phalanx, Infection, Mini-Illizarov*

INTRODUCTION

In 1966 N. Seymour described a special type of fracture of the distal phalanx of the finger in children.¹⁾ This fracture became an eponym. Nowadays Seymour fracture means extra-articular transverse fracture of the distal phalanx fingers in children or adults.^{2,3)} Very often this kind of fracture is open, has avulsion of the nail plate, laceration (interposition) of the nail bed and volar angular deformation. The typical complications of Seymour fractures are infection, osteomyelitis, mimic mallet finger deformation, premature closure of growth zones in children and nail deformation.¹⁻³⁾ According to high risk of infection, N. Seymour did not recommend to use K-wire internal fixation in case of the open fracture. However, the more modern authors consider it possible after precise wound debridement, irrigation and use of antibiotics.⁴⁻⁷⁾ Nevertheless, Seymour's recommendation remains relevant in a case of the infected fracture. One of the important principles of the treatment of the infected fractures is a stable fixation of the bone segment with the aid of external devices with insertion of the interbone elements (K-wire, pins) outside of the area of the fracture (out of focus). This principle was used for the treatment of our patient with an open infected Seymour fracture.

CASE REPORT

A 24-year-old male (carpenter) presented with the open infected distal phalanx fracture of the middle finger of his right dominate hand. He applied only on the 5th day after trauma (a heavy board had fallen on his hand), because the pain and swelling of the finger increased, and purulent discharge appeared. The injured digit presented with a mallet deformity, swelling, redness and pus draining from the partly destroyed and avulsed nail plate. The X-ray revealed a transverse fracture of the distal phalanx with volar angular displacement (Fig. 1A). Under local anesthesia the destroyed nail plate was removed. At the level of the nail bed a 5 mm laceration was covered with fibrin and purulent granulations. Fibrin and granulations were then removed. Wound irrigation and debridement were performed. After that, the mini-Illizarov frame was assembled. The assembling process was as follows: K-wire 1 mm in diameter was inserted through the proximal part of the middle phalanx in the frontal plane. The second K-wire was inserted through the distal part of the distal phalanx in the frontal plane. Then each K-wire was fixed in two arcs of 35 mm in diameter, which are connected by rods. At first the apparatus was assembled with only two K-wires and two arcs. The acute distraction of 2 mm was performed with the aid of nuts on the rods. Then at the level of the proximal arc, an additional K-wire was inserted as a console perpendicular to the first K-wire. The additional K-wire was inserted longitudinally through the distal fragment of the distal phalanx. This K-wire was inserted in the form of a console "out of focus" only through the distal frag-

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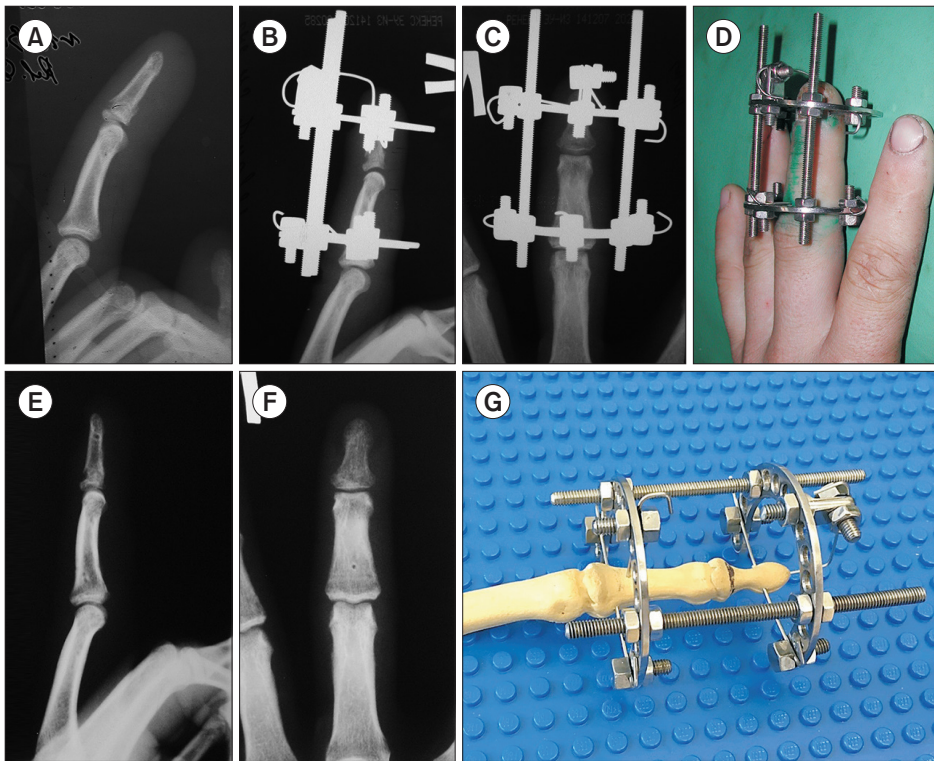


Fig. 1. (A) X-ray 5 days after trauma; (B–D) X-ray and photo of the hand 4 weeks after surgery; (E, F) X-ray 6 weeks after surgery; (G) the proposed method of assembling the apparatus on a bone model.

ments (not reaching the site of the fracture). At the tip of the finger, the K-wire was bent at a right angle and fixed to the distal arc with the aid of a console device. Bone deformation was eliminated (Fig. 1B, C). Subsequently, wound dressings were performed and antibiotics prescribed. One week post-operatively the signs of infection had resolved. The duration of fixation was 30 days. Apparatus was stable for the full period of the fixation (Fig. 1D). The wound healed under a scab. The apparatus was disassembled. Bone healing was achieved in correct position (Fig. 1E, F). The patient returned to his work 2 months after the surgery. No pain but mild stiffness in the DIP joint was observed in this period.

DISCUSSION

Many external devices are invented for fixation of small bone fragments. Mini-Ilizarov apparatus is distinguished by its versatility. The standard set permits the assembly of an apparatus for fixation of bone fragments, reposition, distraction or compression. In our case a mini frame, assembled from a few details, allowed us to do distraction, reposition and stable fixation for the entire period of treatment. The out of focus stable fixation provided a resolution to the infectious process and enabled us to achieve a stable osseous union in correct position.

This method is inferior to translesional k-wire inser-

tion method for fixation of distal phalanx fracture in respect of time-cost-effectiveness. Furthermore, surgeons need to have a minimum knowledge about standard mini-Ilizarov set before surgery. However, the proposed method of assembling the apparatus is not complicated and can be reproduced (Fig. 1G).

Nail changes are a common complication of Seymour fracture. However, we do not know about the nail condition of our patient because he was lost for the long-term follow-up.

Wound debridement, irrigation, use of antibiotics and external fixation is effective in the treatment of an open infected Seymour fracture. A priori, proposed type of assembly of the mini-Ilizarov can be used not only for the treatment of infected Seymour fractures but also for the treatment of infected intra-articular fractures and mallet finger's type injuries.

CONFLICT OF INTEREST

None declared.

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