

CASE STUDY



The Use of NX Nail for Intramedullary Fixation of a Proximal Phalanx Base Fracture

The Surgeon

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Introduction

A 35-year-old male presented to the emergency department after sustaining a crush injury to his left hand while moving heavy machinery at work. Three days later he presented to Dr. Anderson for specialist review and management. Based on the clinical examination and radiographic findings, Dr. Anderson performed surgery the following day. Anatomic reduction and definitive fixation were achieved by using single intramedullary 3.0 NX Nails from Field Orthopaedics for each of the proximal phalanges of the 2nd-5th fingers.

The Case



Patient Profile

The patient is a 35-year-old right hand dominant contract laborer who presented to the emergency department (ED) after sustaining a crush injury to his left hand while moving heavy machinery at work. Radiographs confirmed significantly comminuted fractures to the proximal phalanges of the index, middle, ring, and little fingers. CT scans showed no intra-articular extension of any of the fractures.



Pre-operative Assessment

Fixation of all four phalanges would provide bony stability and allow for early active ROM. The surgical plan was to fix the fractures via intramedullary nailing to avoid further soft tissue trauma. A single night stay post-surgery with intravenous antibiotics and hand therapy in the post-operative period of 6-12 weeks was recommended.



Above: Pre-operative Imaging



Surgical Treatment

The patient presented for surgical fixation the following day, a total of four days after the initial injury. Preoperative templating was performed, and an estimated canal diameter and corresponding nail size was obtained. The procedure took place under general anaesthesia with the patient in a supine position. The wound to the volar aspect of the index finger was explored and a wash out procedure performed.

Reduction

Identical procedural steps were performed to the index, middle, ring and little fingers, in that order. The extensor mechanism was split centrally and retracted to provide visibility. Closed reduction was achieved with traction and manual pressure for all fractures. The metacarpophalangeal joints (MCPJ) were flexed and entry points identified on the dorsal third of all proximal phalanges. K-wires were passed through the intramedullary canal in an antegrade direction. Nail length was measured using the depth gauge and confirmed by holding the nail over the finger under image intensifier (II) before insertion.

Templating

To confirm the diameter, the depth gauge was aligned with the borders of the isthmus of the phalanx under fluoroscopy. When templating, there was a slight lucency surrounding the depth gauge at the isthmus to allow the nail to pass through without making contact with cortical bone. In this case, 3.0 NX Nails from Field Orthopaedics were used, ensuring subtle lucency around the threads.

Fixation

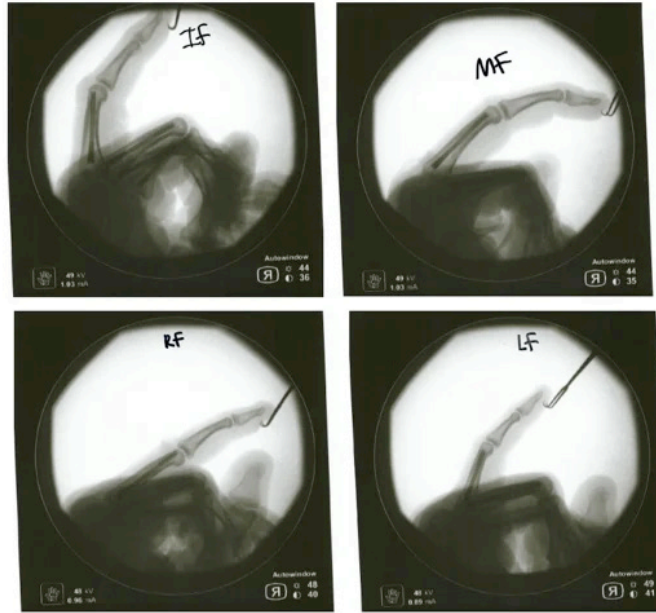
The corresponding cannulated drill bit for the 3.0 NX Nails from Field Orthopaedics was placed over the K-wire and an insertion tunnel was drilled. The drill was passed beyond the isthmus and the position of the K-wire was maintained as the drill was removed.

The standard meta drill was used (rather than the extended drill) to prepare the bone in the shape of the implant head.

After the appropriate path for the NX nail had been created, the implant was inserted in an antegrade fashion over the K-wire with careful attention paid to ensure maintenance of reduction. Correct implant placement was confirmed with fluoroscopy and rotation of the fingers carefully assessed.



Surgical Treatment - continued



Above: Intra-Operative Imaging



Post-operative Treatment

The patient was to attend an initial post-operative review with Dr Anderson's hand therapist the following day. Following this, the patient was advised to attend follow up reviews with Dr Anderson at 2 weeks, 6 weeks and 3 months post-op. As the patient was not local a referral was made to a regional hand therapist for regular review between scheduled follow-up appointments.



Above: Intra-Operative Imaging



Conclusion

Dr. Anderson was able to treat a significant injury for a young, active patient and achieve full return to function within three months using the NX Nail from Field Orthopaedics. Definitive fixation through a percutaneous approach minimised further soft tissue disruption and provided the patient an expedited return to full function and a complete recovery.



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