Case Study:

Use of InFrame™ Intramedullary Threaded Micro Nails for Proximal, Transverse Fractures to the 4th and 5th Proximal Phalanges

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EXSOMED™
Innovations in Hand Surgery

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Pre-op

Case Presentation

Patient was a 67-year-old, right hand dominant female who suffered proximal, transverse fractures to her 4th and 5th proximal phalanges from a fall while walking. A minimally invasive approach achieving rotational and bending stability to allow for early range of motion was desired.

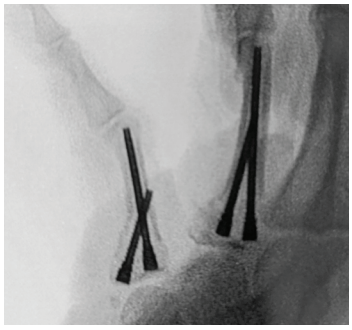
Pre-op Plan

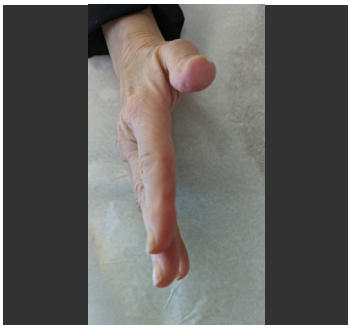
Dr. Rosenbaum normally considers a minimally invasive approach to address phalangeal fractures but wanted to achieve stronger stabilization without the possibility of high infection rates and need for immobilization. He also evaluated plates and screws as an option due to the rigid fixation but wanted to avoid soft tissue disruption that could lead to complications such as stiffness and tendon adhesions. Dr. Rosenbaum recommended InFrame to his patient because the 2.0mm diameter design allowed him to create fracture-specific constructs to achieve bending and rotational stability for early mobilization. The unique dual diameter guidewire facilitated precise and efficient placement by removing the need for reaming and allowing InFrame to be inserted over the trailing end of the guidewire with ease. Biomechanical testing has demonstrated the superior rigidity with InFrame compared to K-wires, headless compression screws, and plates and screws, allowing immediate active ROM and reduced recovery time.

Operative Findings and Approach

Once reduction was achieved, Dr. Rosenbaum inserted the dual diameter guidewire across the fracture site from the radial proximal cortex to the ulnar distal cortex under fluoroscope to stabilize the fracture and accurately align the desired final implant position. Next, he used the depth gauge to determine that a 36mm micro nail was needed for the 4th proximal phalanx. The larger diameter of the guidewire was used to push the guidewire distally until the

Post-op





smaller diameter was across the fracture. He then inserted the cannulated InFrame micro nail until bi-cortical purchase was achieved at both the distal and proximal ends. Once he verified the final position of the first implant under fluoroscope, Dr. Rosenbaum used the same methodology to place the second InFrame micro nail but in a different plane from the first implant. He then inserted the second dual diameter guidewire from the ulnar proximal cortex to radial midshaft cortex under fluoroscope and used a 24mm micro nail to create an "X" configuration, resulting in rigid fixation and rotational stability. Dr. Rosenbaum utilized the same surgical technique to implant two InFrame implants in the 5th proximal phalanx but used a 28mm and 18mm micro nail. To address this fracture, he used a micro nail to create a "Y" construct. Total surgery time was 40 minutes.

Follow-up

At 2-weeks post-op, the patient demonstrated excellent range of motion with minimal pain during daily activities. Radiographs confirmed appropriate alignment and positioning.

Discussion

Dr. Rosenbaum has been pleased with InFrame as the implant system allows him to achieve his operative goals of stable fixation, minimal to no complications, and most importantly, early mobilization. The dual diameter guidewire of the InFrame system offers the benefit of surgical efficiency by removing the need for a dedicated reamer. Follow-ups are typically easy and straight-forward because patients do not require formal therapy, as mobilization is immediate, allowing patients to return to their daily activities faster than other implants and surgical approaches.