

Case Study

Use of the InFrame™ Intramedullary Threaded Micro Nail for an Oblique Fracture of the Second Proximal Phalanx



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Dr. Iorio is a board certified Orthopedic Hand and Upper Extermity surgeon and Microsurgery Associate in Columbus Ohio. He is fellowship trained at the Philadelphia Hand to Shoulder Center and specializes in both non-operative and operative treatment of hand, wrist, elbow, and shoulder conditions in central Ohio.

Case Presentation

Patient was a 58-year-old female who suffered a proximal, oblique fracture to her second proximal phalanx from a fall during a bicycle accident. A minimally invasive approach, without complications such as stiffness or infections, was desired to achieve immediate range of motion (ROM) to expedite recovery.

Preop Plan

Dr. Iorio typically addresses proximal phalanx fractures with K-wire fixation due to the minimally invasive approach but wanted to avoid pin site infections while achieving immediate mobilization. He decided to use InFrame Intramedullary Micro Nail System because the 2.0 mm diameter design allowed him to use more than one intramedullary micro nail to create a construct that achieved rigid fixation with rotational stability. The unique dual diameter guidewire facilitates the accurate and efficient placement of the fully threaded micro nail by removing the need for reaming and allowing InFrame to be inserted over the trailing end of the guide wire 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 time¹.

Operative Findings and Approach

Once reduction was achieved, Dr. Iorio inserted the dual diameter guide wire across the fracture site from the radial proximal cortex to the 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 28 mm micro nail was needed for the second proximal phalanx. The larger diameter of the guide wire was used to push the guide wire distally until the smaller diameter was across the fracture.

He then threaded the cannulated InFrame Micro Nail until bicortical purchase was achieved at both the distal and proximal ends. Once he verified the final position of the first implant under fluoroscope, Dr. Iorio placed the second InFrame in the same plane but on a different trajectory from the first implant. He inserted the second dual diameter guide wire from the ulnar proximal cortex to the radial midshaft cortex under fluoroscope and used a 16 mm InFrame.

Due to the narrow isthmus of the intramedullary canal, Dr. Iorio created a “Y” configuration with the second, shorter implant. Total surgery time was approximately 15 minutes.

Preoperative



1. Data on file with Acumed

Postoperative



Follow-up

Immediately after surgery, the patient did not require a postoperative splint due to the stable fixation achieved by InFrame. At two weeks postop, she did not experience any pain and regained full ROM without any complications or restrictions from daily activities.

Discussion

With InFrame, Dr. Iorio was able not only to achieve rigid fixation with rotational stability from a “Y” frame construct, but also complete the surgery in only 15 minutes. He was able to avoid complications such as pin site infections that typically occur when using K-wires due to extramedullary hardware. The 2.0 mm diameter design and robust length offerings of InFrame allowed Dr. Iorio to create an optimal construct, allowing his patient to experience immediate ROM. For InFrame, the delivery mechanism is also crucial because it removes the need for a dedicated reamer, thereby simplifying and improving the accuracy of the placement. The strong fixation and rotational stability allowed his patient to minimize her downtime and return to daily activities faster than with other implants and surgical approaches¹.



1. Data on file with Acumed



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