Case Study

Use of the InFrame™ Intramedullary Threaded Micro Nail for a Midshaft Transverse Fracture to the First Proximal Phalanx

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Dr. Tibor Warganich is a board certified orthopedic surgeon specializing in general orthopedic, hand, wrist, and upper extremity surgeries along with stem cell therapy. He completed the Hand and Upper Extremity Surgery Fellowship Program at the Mayo Clinic in Rochester, MN and currently practices in Dakota Dunes, South Dakota.

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Case Presentation

Patient was a 19-year-old male manual laborer who suffered a midshaft transverse fracture to his first proximal phalanx from a crush injury while on the job. A minimally invasive approach with stable fixation was desired to achieve immediate to early range of motion (ROM), avoiding complications such as stiffness.

Preop Plan

Dr. Warganich normally considers K-wire fixation to address proximal phalanx fractures but wanted to avoid pin site infections and stiffness caused by extramedullary hardware and immobilization, respectively. He decided to proceed with InFrame™ because the cannulated, fully threaded micro nail has a 2.0 mm diameter design that allows the use of more than one implant in the narrow intramedullary (IM) canal to create a construct that achieves rotational and bending stability. InFrame also includes an innovative dual diameter guide wire that facilitates precise and efficient placement by removing the need for reaming and allowing the implant to be inserted over the trailing end of the guide wire with ease.

Operative Findings and Approach

Once anatomic reduction was achieved, Dr. Warganich inserted the dual diameter guide wire across the fracture site from the radial proximal cortex to the distal cortex under fluoroscopy 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 first 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 inserted the cannulated InFrame micro nail until bicortical purchase was achieved at both the distal and proximal ends. After Dr. Warganich verified the final position of the first implant under fluoroscope, he used the same methodology to place the second InFrame micro nail but in a different plane from the first implant. He inserted the second dual diameter guide wire from the ulnar proximal cortex to the distal cortex under fluoroscopy and used another 28 mm micro nail to achieve stable fixation without any rotational deformities. Total surgery time to create the “V” construct was approximately 15 minutes with no need for a tourniquet.

Preoperative

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Postoperative

Follow-up

At two weeks postop, the patient demonstrated nearly full ROM with no complications or pain. Radiographs confirmed radiographic union and anatomic restoration. At four weeks postop, the patient experienced full active ROM and returned to unrestricted activity.

Discussion

Dr. Warganich has been pleased with InFrame™ as the implant and surgical technique allow him to achieve his operative goals of stable fixation, early mobilization, and reduced time in the operating room. The 2.0 mm diameter design and robust length offerings of InFrame allowed him to create an optimal "V" construct to fit the narrow IM canal and achieve rotational stability in only 15 minutes. His patient was satisfied with the results and was able to return to work faster than than with plates or k-wires.†

†Data on file with Acumed

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