

## Case Study

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

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## Marissa Matarrese, MD

University of Vermont Health Network  
Plattsburgh, NY

Dr. Marissa Matarrese, a graduate of University of Washington School of Medicine, completed a hand fellowship while at UMass Chan Medical School. She specializes in orthopedic hand and upper extremity reconstruction surgery.

## Case Presentation

Patient was a 59-year-old male who suffered a proximal, oblique fracture to the base of his fifth proximal phalanx when his power drill spun around and twisted his finger. A percutaneous approach providing stable fixation to allow for early mobilization was desired.

## Preop Plan

Dr. Matarrese considered headless compression screws due to the minimally invasive approach and early mobilization but was concerned that compression would cause angulation or shortening across the fracture site. She also considered lag screws but did not want to leave any extramedullary hardware behind. Dr. Matarrese proceeded with InFrame™ because the cannulated, fully threaded micro nail allowed for a straightforward and efficient placement without any hardware exposure, through a percutaneous, intramedullary approach. The InFrame implant has a 2.0 mm diameter design with a robust range of lengths from 12 mm–48 mm in 2 mm increments, allowing various construct patterns to achieve rigid fixation and rotational stability. The unique dual diameter guide wire facilitated precise and efficient placement 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 earlier active range of motion (ROM) and reduced recovery time.<sup>1</sup>

## Operative Findings and Approach

The patient suffered an oblique base fracture to his fifth proximal phalanx. Once anatomic reduction was achieved by Dr. Matarrese, she used a closed, percutaneous approach with InFrame. She inserted the dual diameter guide wire across the fracture site from the ulnar proximal cortex to the radial distal cortex using mini fluoroscopy to stabilize the fracture and accurately align the desired final implant position.

Next, Dr. Matarrese used the depth gauge to determine that a 28 mm micro nail was needed for the fifth 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. She then threaded the cannulated InFrame micro nail until it was seated in the subchondral bone. Once she verified the final position of the first implant under fluoroscope, Dr. Matarrese used the same methodology to place the second InFrame micro nail but in a different plane from the first implant. She then inserted the second dual diameter guide wire from the radial proximal cortex to the ulnar distal cortex under fluoroscope and used another 28 mm micro nail to create a “V” configuration with slight crossing at the distal end, resulting in stable fixation with no rotational deformity. Total surgery time was approximately 10 minutes.

## Preoperative



1. Data on file with Acumed

## Postoperative



## Follow-up

At one-week post-op, the patient demonstrated nearly full range of motion with no complications and was expected to reach full range of motion without any restrictions in one to two months.

## Discussion

InFrame allowed Dr. Matarresse to achieve her operative goal of stable fixation, rotational stability, and minimal to no soft tissue damage. The simple and straightforward placement of the InFrame micro nail allowed the surgery to be completed in only 10 minutes and under local anesthesia. The 2.0 mm diameter design and robust length offering allowed Dr. Matarresse to create a “V” frame construct with no extramedullary hardware and zero complications. The innovative delivery mechanism for InFrame is also important because it simplified the implant placement by removing the need for a dedicated reamer. Her patient was satisfied with the results and experienced anatomic and functional restoration of his proximal phalanx.



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Acumed USA Campus  
5885 NE Cornelius Pass Road  
Hillsboro, OR 97124  
+1.888.627.9957

OsteoMed USA Campus  
3885 Arapaho Road  
Addison, TX 75001  
+1.800.456.7779

Acumed Iberica Campus  
C. Proción, 1  
Edificio Oficor  
28023 Madrid, Spain  
+34.913.51.63.57

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