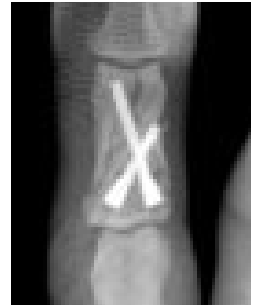


## Case Study

# Use of the InFrame™ Intramedullary Threaded Micro Nail for a Transverse, Comminuted Fracture of the Fifth Middle Phalanx

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## Robert Foster, MD

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Dr. Robert Foster is a board certified orthopedic surgeon with fellowship training in hand surgery from the University of Minnesota in Minneapolis. He has a background in biomedical engineering that helps him bring a highly technical and intuitive approach to hand surgery.

## Case Presentation

Patient was a 41-year-old male who suffered a midshaft transverse fracture with comminution to his fourth middle phalanx when it was hit with a sledgehammer. A minimally invasive approach resulting in stable fixation and rotational stability was desired to achieve immediate range of motion (ROM) and minimal time away from work.

## Preop Plan

Dr. Foster normally addresses middle phalanx fractures with K-wire fixation to avoid soft tissue disruption but wanted superior stability that would allow immediate mobility. He also considered implanting a headless compression screw (HCS) down the central canal but feared that it would displace the sagittal plane fracture. Dr. Foster chose InFrame™ because the 2.0 mm diameter design was narrow enough not only to fit the intramedullary (IM) canal, but also to allow more than one micro nail to create a construct that achieved rigid fixation with rotational stability. The unique dual diameter guide wire 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 of a “Y” InFrame™ construct compared to K-wires and HCSs, allowing immediate active ROM and reduced recovery time.

## Operative Findings and Approach

Upon anatomic reduction, Dr. Foster inserted the dual diameter guide wire across the fracture site from the ulnar proximal cortex to the radial 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 20 mm micro nail was needed for the fifth middle 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. Foster 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 guide wire from the radial proximal cortex to the ulnar midshaft cortex under fluoroscope and used a 14 mm micro nail. Dr. Foster achieved stable fixation and rotational stability by creating a “Y” construct with a total surgery time of approximately 15 minutes.

## Preoperative



## Postoperative



## Follow-up

At two weeks, the patient did not experience any pain and regained full ROM without any complications or restrictions from daily activities.

## Discussion

Through the use of InFrame™, Dr. Foster was able to fill the narrow IM canal with more than one implant, creating a “Y” construct that achieved rigid fixation and rotational stability. The 2.0 mm diameter design and robust length offerings provided Dr. Foster with the flexibility to create an optimal construct specific to his patient’s fracture pattern and location. The unique delivery mechanism that accompanies InFrame™ is also critical because it removes the need for a dedicated reamer, simplifying a more precise placement and reducing surgery time to as little as 15 minutes. Dr. Foster was extremely satisfied with his outcomes and would not have done anything differently.



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