

## Case Study:

Use of the INnate™ Intramedullary Threaded Nail for Fixation of Midshaft Fractures of the 2nd, 3rd, and 4th Metatarsals

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Michael Patterson, MD  
Shelby Baptist Medical Center  
Alabaster, AL



## Case Presentation

Pre-op



Patient was an 16-year-old male who presented to clinic with midshaft, transverse fractures to his 2nd and 3rd metatarsals and a midshaft, oblique fracture to his 4th metatarsal suffered from a fall while jumping in a bounce house. A minimally invasive approach resulting in early mobilization was desired as the patient was physically active and could not afford to miss time at work.

## Pre-op Plan

Dr. Patterson normally considers K-wire fixation but was concerned that the lack of rigidity and the extramedullary hardware would lead to immobilization and complications such as infections and secondary procedure risks. He decided to proceed with the INnate intramedullary nail to treat these metatarsal fractures because the nails were long enough in length and wide enough in diameter to fill the canal, providing stable fixation for earlier range of motion.



## Operative Findings and Approach

Dr. Patterson utilized longitudinal traction, hyperextended the toe, and made a small dorsal incision over the 4th metatarsal for reduction and approach. He next placed a guidewire percutaneously in a retrograde fashion, targeting the center of the intramedullary canal of the metatarsal under fluoroscopy. Upon reduction and guidewire placement, Dr. Patterson performed a 4 mm longitudinal vertical split around the guidewire, through the flexor tendon and capsule. Using the INnate depth gauge, he determined that 3.6 mm x 45 mm implant was needed for the 4th metatarsal. Dr. Patterson proceeded to use the cannulated reamer to drill over the guidewire and implant the INnate nail until the trailing end was beneath the articular surface and proximal fixation was achieved at the isthmus. He then repeated these steps but used 3.6 mm x 50 mm and 3.6 mm x 55 mm implants for the 2nd and 3rd metatarsal fractures, respectively. The total surgery time was approximately 20 minutes.

## Follow-up

Immediately after surgery, the patient experienced minimal pain and full active range of motion. At 2-weeks post-op, the patient was able to partially bear weight in a boot, and at 4-weeks post-op, he returned to full activity without any complications. At 8-weeks post-op, Dr. Patterson confirmed that the patient experienced no pain, had full range of motion, and would be working out of his foot insert within the following 2 weeks.

Post-op



## Discussion

INnate allowed Dr. Patterson to use a minimally invasive approach with appropriately sized implants to achieve stable fixation. Unlike K-Wire, the differential diameter design and the extensive length offering of the INnate System delivered canal-fill and rotational stability, which offered immediate to early range of motion. This enabled his patient to minimize his downtime and return to work or daily activities faster than other implants and surgical approaches.