

Case Study

Use of the INnate™ Intramedullary Threaded Nail for an Oblique Fracture of the Fifth Metacarpal Neck



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Dr. Yao joined the Hand and Upper Extremity Service at Stanford University Medical Center in 2005. He graduated from Cornell University Medical College and completed his residency at the Albert Einstein College of Medicine in New York. His hand and upper extremity surgery fellowship was completed at Thomas Jefferson University and the Philadelphia Hand Center.

Case Presentation

Patient was a 35-year-old female who presented to clinic with an oblique fracture of the fifth metacarpal neck suffered from a fall. There was some clinical malrotation of the small finger. She is a horse trainer and needed to return to work quickly, so she elected surgical management. Stable fixation was necessary to restore the alignment and length of the metacarpal and allow early range of motion.

Preop Plan

As the patient needed to return to work and daily activities quickly, Dr. Yao chose intramedullary fixation with INnate™ because the nails were long and wide enough in length and diameter to fill the canal, providing the necessary stable fixation that would restore rotation, alignment, and length of the metacarpal. This minimally invasive approach decreases the necessary operative time, allows for early range of motion, and minimizes recovery time. Alternative methods and implants would not have allowed immediate mobility, thereby making a quick recovery less likely.

Operative Findings and Approach

Dr. Yao used a percutaneous approach with INnate to stabilize the metacarpal fracture. He first performed longitudinal traction on the small finger to restore normal rotation, length, and alignment, and then used a percutaneously applied pointed reduction clamp to maintain the reduction. Using the INnate depth gauge, he determined that a 3.6 mm x 40 mm nail was needed. He made a 2 mm incision over the fifth metacarpophalangeal joint aligned with the dorsal third of the metacarpal head of the small finger, and inserted the provided guide wire through the extensor mechanism, through the dorsal third of the metacarpal head, and then across the fracture site under fluoroscopic guidance. He then used the cannulated drill to drill over the guidewire (directly through the extensor tendon) and threaded the cannulated INnate nail until the head was countersunk beneath the articular cartilage to achieve distal purchase in the subchondral bone.

Proximal purchase was achieved at the isthmic level within the intramedullary canal with a total surgery time of 25 minutes.

Preoperative



Intraoperative



Intraoperative



Postoperative



Follow Up

The patient was splinted for four days and then started light physical therapy for range of motion. On the seventh day post-op, the patient had minimal pain, full active extension, and the ability to actively flex the small finger to within 1 cm of the distal palmar crease. At final follow-up the patient had completely recovered.

Discussion

Dr. Yao has been pleased with the INnate nail. It is his first choice for treating many different patterns of metacarpal fractures, including straightforward cases such as this oblique neck fracture. INnate allowed Dr. Yao to address the fracture efficiently while maintaining height and relying upon the intermetacarpal ligaments to provide rotational stability. INnate has various lengths and diameters that allow proper canal-fill and affords excellent fixation and rotational stability. The implant does not require additional resources, and follow-ups are typically easy and straightforward because few patients require lengthy formal therapy, as mobilization is immediate. In Dr. Yao's opinion, this allows patients to minimize their downtime and return to work and daily activities faster than with other implants and surgical approaches.



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