

Case Study:

Use of the INnate™ Intramedullary Threaded Nail for Displaced, Open, Base Fractures of the 3rd, 4th, and 5th Metacarpals



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Pre-op



Case Presentation

Patient was a 20-year-old right-handed, male guitarist who was thrown off his motorcycle in a high-speed collision when the vehicle in front of him abruptly stopped. He presented with displaced, open base fractures of the right 3rd, 4th, and 5th metacarpals as well as diagnosed with a concussion. Once stabilized two days after the accident, he was taken immediately to surgery. Because of the amount of shortening and apex dorsal angulation present at the fracture site, as well as the ulnarward malrotation of the ring finger, reduction and operative fixation were recommended.

Pre-op Plan

Given the severity of the injury, Dr. Manon-Matos decided to use the INnate intramedullary nail as it would allow for limited soft tissue dissection along with minimal disruption of soft-tissue planes compared to other fixation techniques. Likewise, it avoided potential complications commonly associated with K-wire fixation. The nail would also enable earlier rehabilitation and active range of motion – important considerations for the patient to maintain manual dexterity and return as quickly as possible to playing guitar again.

Operative Findings and Approach

Dr. Manon-Matos briefly explored the dorsal superficial lacerations in extensor zone 6 and concluded no tendon damage. The dorsal skin envelope was healthy and well perfused. He then achieved closed reduction of each fracture manually. Fracture fixation occurred sequentially, beginning with the 3rd (long) metacarpal, followed by the 4th (ring) metacarpal, and lastly, the 5th (small) metacarpal. Under fluoroscopic guidance, the guidewire was placed percutaneously in a retrograde fashion from the metacarpal head into the metacarpal base beyond the fracture site. Once the guidewire was in good position, he made a 5mm stab incision around the wire insertion point. Using the depth gauge and fluoroscopy, he determined the appropriate implant size and length to use for each fracture

Post-op



prior to passing the cannulated drill over the guidewire to drill to the desired depth. He then threaded the cannulated INnate nail beyond the fracture site until the head was just beneath the articular cartilage, achieving distal purchase in the subchondral bone and proximal purchase at the metacarpal base. Dr. Manon-Matos selected the 3.6mm x 55mm nail for the 3rd metacarpal, a 3.6mm x 45mm nail for the 4th metacarpal, and a 4.5mm x 45mm nail for the 5th metacarpal.

This technique was repeated for the 4th and 5th metacarpals as well. Soft dressing and an ulnar gutter splint were placed postoperatively. Total surgery time was approximately 35 minutes.

Follow-up

Within 1 week post-op, early active motion was started under the guidance of a hand therapist and by 2 weeks post-op, the patient felt minimal pain, performed activities as tolerated, and had full active extension of all digits. He could actively flex the long, ring, and small fingers to within 1.0cm of the distal palmar crease. By 4 weeks post-op, the patient returned to full activity and was able to play guitar again.

Discussion

Dr. Manon-Matos continues to use the INnate nail as it is minimally invasive and non-compressive, requires no casting, and allows immediate mobilization and rapid recovery. He believes the implant is a superior alternative to other fixation techniques due to limited soft-tissue dissection, and ease of reduction and fixation. Because of the consistent, positive outcomes he is able to achieve with the nail, patient satisfaction has been very high. Other benefits he discovered since using INnate in his practice include decreased operative time and anesthesia requirements, resulting in lower resource utilization and cost of care.