

Case Study

Use of the INnate™ Intramedullary Threaded Nail for Displaced Fractures of the Third and Fourth Metacarpal Shafts



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Dr. Styron completed his residency at the Cleveland Clinic and then pursued two fellowships to hone his subspecialty training in hand and upper extremity at the University of Pittsburgh Medical Center and at Shriners' Hospital in pediatric and congenital hand surgery. Dr. Styron's specialty interests include surgery of the hand, wrist, elbow and shoulder. He has specialized training in nerve and tendon transfers in infants and children unable to move their hands.

Case Presentation

Patient was a 24-year-old right-hand dominant male who presented to clinic six days after getting his dominant hand smashed in a car door, sustaining closed, displaced fractures of both his third and fourth metacarpal shafts. Patient is a carpenter and wanted to be able to return to work quickly. He needed stable fixation to restore the alignment and length of the metacarpals, allowing early range of motion (ROM).

Preop Plan

Dr. Styron discussed three approaches with the patient: 1) closed reduction with intramedullary nails, 2) open reduction with plates and screws, and 3) closed reduction with percutaneous pinning. As the patient wanted to minimize downtime and return to work quickly, Dr. Styron chose intramedullary fixation with INnate™. This approach would also decrease the necessary operative time.

Operative Findings and Approach

Dr. Styron made a small, curvilinear incision around the third metacarpal head. The extensor tendon was retracted and the joint capsule incised to expose the metacarpal head. The guide wire was placed in the dorsal one third of the metacarpal head. While performing a reduction maneuver on the metacarpal shaft, the guide wire was passed in a retrograde fashion across the fracture. The cannulated drill was used once proper pin placement was confirmed with the depth gauge under fluoroscopy. An INnate was then inserted, the wound copiously irrigated, and then closed in layers. This was then repeated for the fourth metacarpal through a separate small incision, in an identical fashion. The procedure used 4.5 mm diameter INnate with a length of 55 mm in both metacarpals. Total surgery time was 25 minutes.

Preoperative



Postoperative



Follow-up

At patient's very first postop visit, 11 days after surgery, his stitches were removed and he already had full active digital ROM. Patient was also able to make a composite fist with minimal discomfort. The occupational therapist placed him in a removable brace, to be worn when doing any heavy activities; otherwise, patient was instructed to stay out of his brace for active motion.

Discussion

INnate™ does an excellent job in providing stability to the fracture with minimal disruption of the soft tissues. This allows for early ROM, decreasing tendon adhesions and stiffness, and accelerating the patient's return to function. Placement of INnate is simple and straightforward, thereby reducing operative time. In Dr. Styron's professional opinion, the purpose-built design allows for immediate mobilization, minimizing patient downtime and accelerating return to work or daily activities when compared with other implants and surgical approaches.



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