

## Case Study

# The Use of Closed Reduction Intramedullary Fixation for Midshaft Oblique Fractures in Three Metacarpals

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Dr. Marc Richard, a graduate of University of Vermont College of Medicine, completed a hand fellowship while at Duke University. He specializes in elbow, wrist, and hand injuries.

## Case Introduction

Patient was an 18-year-old high school senior lacrosse player who fractured three of his metacarpals in a collision during a game. Initially, he was concerned that he would miss the remainder of his senior season.

## Case Presentation

Patient had midshaft oblique comminuted fractures to his 3rd, 4th, and 5th metacarpals. He needed stable fixation and rotational alignment to mobilize as soon as possible if he hoped to return for the final games of his high school career.

## Preop Plan

Dr. Richard chose closed reduction intramedullary fixation (CRIF) with INnate™ because the nails were long and wide enough in diameter to fill the canal, providing stable fixation for rotationally unstable fractures. Alternative implants would not have allowed immediate mobility, thereby preventing a quick recovery.

## Operative Findings and Approach

Dr. Richard first performed longitudinal traction in the operating room to restore alignment and then used a percutaneously-applied pointed reduction clamp to maintain the reduction, until he placed the guide pin. He used a percutaneous approach with INnate to stabilize the multiple metacarpal fractures and measured 4.5 mm for each of the diameters. Dr. Richard again used the INnate depth gauge to determine that a 50 mm length threaded nail was needed for the 3rd metacarpal. He made a 2 mm incision on the dorsal third of the metacarpal head and inserted the provided K-wire across the fracture site under fluoroscope. He then used the cannulated drill to drill over the guide wire and threaded the cannulated INnate nail until the head was beneath the articular cartilage, to achieve distal purchase in the subchondral bone. The same approach was used for the fourth and fifth metacarpals, however, 45 mm length threaded nails were used. Proximal purchase was achieved at the isthmic level within each intramedullary canal, with a total surgery time of 25 minutes.

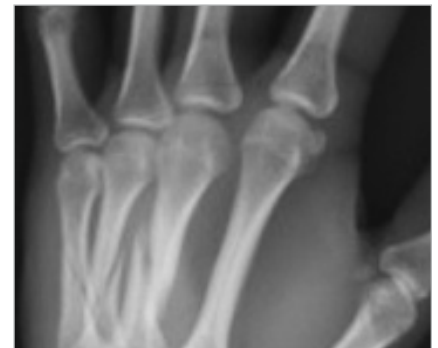
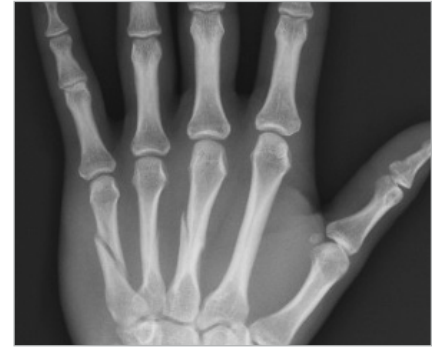
## Follow-Up

The patient was pain-free at his 2-week follow-up visit and was able to return to the field for the final games of his high school career. At 8 weeks follow-up, he had symmetric range of motion to the opposite hand and both clinical and radiographic evidence of union.

## Discussion

A non-compression nail with canal-fill allows the surgeon to address spiral oblique fractures to maintain height and provide rotational stability. INnate has various lengths and diameters that allow canal-fill and affords excellent fixation and rotational stability. The follow-ups are typically easy and straightforward because patients may not need formal therapy as mobilization can be immediate. This can allow patients to minimize their downtime and return to work or daily activities, possibly faster than other surgical approaches.

## Preoperative



## Postoperative

