

## Case Study:

Use of the INnate™ Intramedullary Threaded Nail for  
Comminuted Midshaft Fractures of the 2<sup>nd</sup> and 3<sup>rd</sup> Metacarpal,  
and Midshaft Transverse Fracture of the 4<sup>th</sup> Metacarpal

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Pre-op



## Case Presentation

Patient was a 23-year-old male who suffered a crush injury to his hand during an ATV rollover accident. He had highly comminuted midshaft fractures to his 2<sup>nd</sup> and 3<sup>rd</sup> metacarpal, and a midshaft transverse fracture to his 4<sup>th</sup> metacarpal. He needed stable fixation to restore the alignment and length of the metacarpals, allowing ROM.

## Pre-op Plan

Dr. Stephens considered plates and screws, but the high level of comminution over a long length made any sort of plate fixation of the 3<sup>rd</sup> metacarpal difficult, if not impossible. He also considered K-wires as an intramedullary approach but was concerned with stability due to the length of the fracture and needed a solution that would allow for early range of motion. Dr. Stephens chose intramedullary fixation with INNate because the nails were long and wide enough in length and diameter to fill the canal, providing stable fixation which would restore alignment and length of the metacarpals. This approach would also decrease the necessary operative time, allow for early range of motion, and limit the risk of adhesions and scarring around the implants.

## Operative Findings and Approach

Dr. Stephens utilized the patient's traumatic dorsal wound to expose and reduce the fractures under direct visualization. Once reduction was achieved, he made small accessory incisions on the dorsal third of the metacarpal head and inserted the provided guidewire across the fracture site under fluoroscope. Dr. Stephens had to capture multiple fragments, including the metacarpal head in the 3<sup>rd</sup> metacarpal, due to comminution extending from the distal metaphysis to the base of the metacarpal. He then used the INNate depth gauge to determine that a 4.5mm diameter

## 8 Month Post-op



threaded nail with lengths of 75mm, 75mm, and 65mm were needed for the 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> metacarpals, respectively. Afterwards, he used the cannulated drill to drill over the guidewire, and then threaded the cannulated INnate over the guidewire. Using the cannulated driver, the INnate nail was driven until the head was beneath the articular cartilage, to achieve distal purchase in the subchondral bone. The nails were purposefully placed across the CMC joints to provide stability at the proximal aspect of the fractures and obtain maximum fixation.

## Follow-up

Physical therapy was started immediately for wound care, edema control, and range of motion. At 3 months, radiographic evidence of union and fusion across the CMC joints were achieved. The patient experienced no pain and was already back at work.

## Discussion

INnate offers various lengths and diameters that allow excellent fixation and are long enough to bridge highly comminuted fractures that cannot be addressed by plates and screws. Unlike K-wires, INnate allows for early range of motion and is not associated with high infection rates. Placement of INnate is simple and straight-forward, thereby reducing operative time, and can be removed, if necessary, due to its stainless-steel construct. The purpose-built design allows for immediate mobilization, minimizing patient downtime and accelerating return to work or daily activities when compared to other implants and surgical approaches.