Case Study:

Use of the INnate™ Intramedullary Threaded Nail for Comminuted Fractures of the 3rd and 4th Metacarpals

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EXSOMED™
Innovations in Hand Surgery

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Pre-op

Case Introduction

Patient was a 59-year-old female who suffered a gunshot wound to her right-hand during protests in Washington, DC. For her bones to heal properly, she required rigid framework to prevent collapse and significant shortening of her metacarpals.

Case Presentation

Patient had highly comminuted midshaft and neck fractures to her 3rd and 4th metacarpals. Due to concerns of shortening, compression screws or K-wire fixation were eliminated as options. To achieve stable fixation, an intramedullary nail that spanned through the entire metacarpal was chosen.

Pre-op Plan

Dr. Masden planned to proceed with INnate nail fixation to achieve a stable construct, allowing early range of motion (ROM) and minimizing the cost and inconvenience of a potential return to the operating room. He felt that due to its non-compressive nature, the INnate nail would effectively restore metacarpal length, which would be determined intraoperatively by comparing the fractured bone to the adjacent metacarpals, as well as utilizing an AP radiograph of the contralateral hand.

Operative Findings and Approach

After exploring the wounds, Dr. Masden confirmed that the flexor and extensor tendons were grossly intact. Once both fractures were reduced, he used the INnate depth gauge to determine that a 4.5mm x 55mm INnate intramedullary nail was needed for the 3rd metacarpal and a 3.6mm x 45mm nail was needed for the 4th metacarpal.

Post-op

He made a 2mm 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. The nail achieved proximal purchase at the isthmic level, and was left subchondral, maximizing distal purchase. Full restoration of height was achieved. Total operating time was 89 minutes, which included exploratory/ adjunctive surgery and implanting.

Follow-up

In less than 2 weeks post-op, the patient achieved 75% of her full range of motion, which would have been difficult to replicate with any other fixation techniques or implants.

Discussion

Dr. Masden's approach allowed the patient to experience excellent outcomes and full functionality that would not have been possible with alternative solutions. The patient's early mobilization allowed for earlier physical therapy. Dr. Masden also reduced his costs by minimizing his time in the Operating Room due to the ease of use with INnate.