

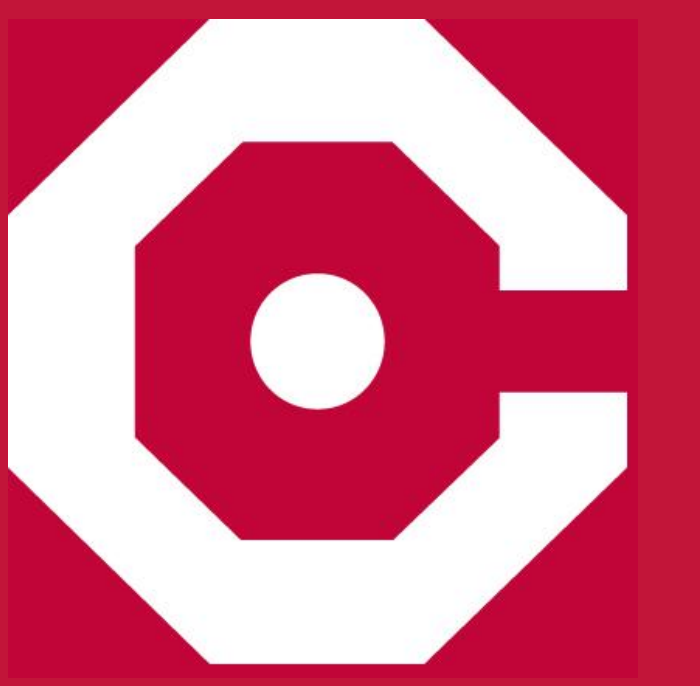


# Diagnosis and Treatment of an Inverted Metacarpal Head Fracture

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## Introduction

- Hemispherical, articular bones can fracture and rotate 180 degrees.<sup>1</sup>
- Because of the symmetry of the bone and the rarity of this deformity, a delay in diagnosis can occur which can lead to a poor outcome such as avascular necrosis (AVN).<sup>2</sup>
- We report on a metacarpal head fracture, that was rotated 180 degrees, and was treated acutely with open reduction. An excellent outcome was observed and with no evidence of AVN.

## Management

- Fractures of the metacarpal heads are typically intra-articular and often require open reduction and fixation.<sup>3</sup>
- Indications for operative management generally include varus/valgus angulation of 10-40 degrees (depending on which metacarpal is fractured), shortening of 2-5mm, articular stepoff, and polytrauma.<sup>3,4</sup>
- Each fracture is treated individually on a case-by-case basis. These fractures can be treated by splinting/casting, Kirschner wiring, 90-90 wiring, or plates and screws, each choice being fracture- and surgeon-dependent.<sup>3</sup>

## Case Presentation

- A 38 year old male, polytrauma patient presented to the emergency department after being struck by a vehicle. He presented with multiple surgical fractures of the upper and lower extremities as well as his pelvis.
- 10 days after admission, X-rays were performed of his painful, left hand which revealed an extra-articular third metacarpal head fracture, for which he underwent open reduction of the fracture. Both collateral ligaments were intact and the head fragment had inverted within the constraints of these ligaments. Some of the ligament and capsular tissue remained attached to the head fragment along the radial and ulnar margins but was otherwise entirely covered with cartilage.
- The reduction maneuver was difficult but after the reduction was achieved, the fracture appeared stable and no internal fixation was used. Post reduction, the injury was splinted for 2 weeks and then early motion was allowed. The fracture has since healed, and the patient has attained near-full function of the finger and joint.



**Figure 1.**  
X Ray of Left Hand  
at Presentation



**Figure 2.**  
1 Week Post Surgery



**Figure 3.**  
10 Weeks Post Surgery

## Discussion

- Several cases have been reported on inverted capitate fractures and inverted lunate dislocations with the risk of avascular necrosis if left undiagnosed and untreated.<sup>1,2,5</sup>
- Heightened awareness and early treatment for such injuries has been emphasized.
- We are reporting on this unique injury pattern and radiographic finding. We were able to successfully treat the injury with early open reduction which did not require internal fixation in our case.

## References

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