

Case Study

Distal Radius Fractures: Alternative Approach to Keystone Fragment Fixation



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Dr. William Pientka II received his medical degree from the University of Texas Health Science Center at San Antonio and is fellowship trained in Hand & Microvascular Surgery from the University of Texas Southwestern Medical Center at San Antonio. He is Chief of Hand Surgery at the JPS Health Network and is an Assistant Professor of Orthopaedics at the TCU Burnett School of Medicine and the University of North Texas HSC. Dr. Pientka is a published leading expert in Kienbock's Disease and hand/wrist trauma reconstruction.

Case Presentation

42-year-old, right-hand-dominant male patient presented to the emergency department on the day of injury after a fall off the ladder, complaining of left wrist pain and deformity. X-rays showed a comminuted intraarticular displaced left distal radius fracture. Nonoperative and operative treatment options were discussed in detail with the patient. Given the displacement, comminution, and intraarticular step-off, operative treatment was recommended.

Preop Plan

Internal fixation with a volar locking plate allowed for reliable return to motion with a decreased risk of hardware irritation compared to a dorsal approach. Furthermore, a volar approach for this patient's fracture pattern enabled direct visualization, reduction, and fixation of the volar ulnar corner articular fragment. Given the distal articular fragment involved the volar ulnar corner, fragment-specific distal radius fixation could offer reliable fracture reduction and stabilization. However, this would require multiple approaches to the distal radius, leading to the potential for increased stiffness.

The volar locking distal radius plate of the Acumed Acu-Loc® 2 Wrist Plating System allowed for fixation of many intraarticular distal radius fractures. The addition of a one-hole hook plate from the Acumed Hand Fracture System to the volar locking plate construct provided additional stabilization of the volar ulnar corner keystone fragment of the distal radius.

The goals of treatment in this patient included stable fixation allowing for early active range of motion while preventing postoperative loss of reduction of the volar ulnar corner.

Operative Findings and Approach

Dr. Pientka performed a standard flexor carpi radialis approach to the volar aspect of the distal radius. An open reduction of the fracture was performed after the fracture site was thoroughly debrided. Once the desired fracture reduction was obtained, a standard volar distal radius plate was provisionally pinned into place. An Acumed 0.8 mm Avulsion Hook Plate was then inserted under the volar locking plate in line with the ulnar most distal locking hole, allowing the hooks to engage into the volar radiocarpal ligaments. This approach provided support to the volar ulnar corner in order to prevent postoperative escape of this critical fracture fragment. The hook plate was secured with a variable angle locking (VAL) screw. The remainder of the volar distal radius plate was fixated with distal locking pegs and nonlocking screws within the shaft portion of the plate. Total operative time was 1 hour 14 minutes.

Preoperative



Postoperative



Follow-up

The patient was placed in a volar resting splint in neutral position until his two-week postoperative follow-up, when he transitioned to a removable brace and began gentle, active range of motion exercises. The patient had no pain (VAS 0). He remained nonweightbearing until the six-week follow-up, at which time he was noted to have near full wrist range of motion and full digital range of motion with a VAS of 0. No formal therapy was required. The patient was allowed to return to his normal activities at that time. At the three-month postoperative visit, the patient had resumed all normal activities and wished to follow up on an as needed basis as he was very happy with his recovery.

Discussion

The Acumed Acu-Loc® 2 Wrist Plating System was Dr. Pientka's first choice for treating distal radius fractures. The comprehensive system offered a wide array of plate families and screws, including volar distal radius plates, fragment specific plates, and the Frag-Loc® two-part compression technology, to enable surgical approach options for distal radius fracture fixation. Additionally, the ability to use the Avulsion Hook Plate with the volar distal radius plate helped stabilize critical articular fragments, minimizing the risk of postoperative carpal subluxation and volar escape.



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