Case Study

Use of the Acu-Loc® 2 VDR Plate for Complex Periarticular Distal Radius Fracture Extending into the Diaphysis

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Dr. Robin Kamal is an internationally recognized expert in hand and wrist conditions, specializing in distal radius fractures and arthritis. He is an Associate Professor at Stanford Health Care, serving as Medical Director for the Value-Based Care Program and Orthopaedic Service Line. Dr. Kamal underwent clinical training at Brown University and Duke University, and holds advanced degrees from the University of Massachusetts and Stanford University.

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Case Presentation

A 48-year-old, right-hand-dominant male sustained a skiing injury to his right wrist and was initially stabilized in a fiberglass splint from the resort's emergency department. The patient presented to clinic with wrist pain one week later where radiographs and CT scans revealed a closed displaced intraarticular distal radius fracture with multiple fragments and potential distal radial ulnar joint (DRUJ) instability. Due to the loss of radial inclination, radial shortening, and intraarticular fracture pattern, Dr. Kamal recommended open reduction internal fixation (ORIF). The surgery was performed under regional block at 10 days post-injury.

Preoperative Plan

The surgical goals of the procedure were to restore anatomic alignment, provide congruity to the articular surface, and reduce the fracture at the sigmoid notch and DRUJ with a standard volar surgical approach. Due to the severity of the injury, Dr. Kamal decided to use the low-profile Volar Distal Radius (VDR) long plate from the Acu-Loc® 2 Wrist Plating System for primary fixation of the radial and intermediate columns due to its ability to achieve anatomic reduction, provide buttressing to prevent carpal subluxation, and allow for faster transition to active physical therapy compared to alternative approaches.

Operative Findings And Approach

Dr. Kamal used the modified volar Henry approach with a longitudinal incision just radial to the flexor carpi radialis (FCR) tendon, and carefully dissected to reach full exposure. Because the distal radius fracture extended into the diaphysis, Dr. Kamal next placed two 2.3 mm cortical screws for lag screw fixation of the proximal diaphyseal fragments. Once confirmed under fluoroscopy, Dr. Kamal turned his attention to restoring the articular surface and anatomic alignment of the distal radius in both radial and intermediate columns. K-wires along with clamps were used for preliminary fixation and reduction of the articular fragments. Then the Acu-Loc 2 VDR long locking plate with two styloid screws stabilized the volar and dorsal fragments, and four distal locking screws targeted the ulnar and radial corners for additional articular support. Three non-locking screws completed the construct proximally. Plate placement, anatomic alignment, and reduction were confirmed under fluoroscopy. The patient was placed in a removeable wrist brace immediately in the operating room for assistance with soft tissue rest and pain management. The procedure went as preoperatively planned, and the tourniquet time was approximately 60 minutes.

Preoperative

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Postoperative

Follow-Up

The patient remained in the removable wrist splint for two weeks postoperatively before initiating guided physical therapy of active range of motion (ROM) and strengthening exercises. The patient recovered with progressive ROM and the brace was worn based on comfort levels throughout the three months of rehabilitation. Radiographs showed normal anatomic restoration to radial length and height, and the articular surface was clinically optimal. At his three-month follow-up, the patient experienced no pain, and wrist ROM was at clinically acceptable parameters.

Discussion

This case presented challenges due to the severity of the fracture patterns in both metaphyseal and diaphyseal regions of the radius and involvement of the sigmoid notch and DRUJ. For this complex intraarticular fracture with multiple fragments, Dr. Kamal chose the contoured Acu-Loc 2 Wrist Plating System because of its ability to offer robust radial styloid fixation to aid in rotational and axial stability as well as a flexible screw trajectory to provide subchondral rafting support.

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