

Case Study:

Use of Acu-Loc[®] 2 Wrist Plating System Volar Distal Radius (VDR) Plate for ORIF Revision of Comminuted Distal Radius Articular Fracture



Randy Bindra, MD, FRACS

Professor of Orthopaedic Surgery
Griffith University School of Medicine and Gold Coast Private Hospital
Southport, QLD, Australia

Case Presentation

The patient was a 24-year-old right-handed student who sustained a fracture of his left wrist after a fall down a flight of stairs. After receiving treatment at another hospital, he presented to Dr. Bindra two weeks later with increasing median neuropathy. Radiography showed a volar pin plate applied to the teardrop fragment with no internal fixation of the radial column. The wrist was stabilized with a spanning external fixator. CT imaging showed impact and depression of the distal radius articular surface with dorsal tilt and loss of articular congruity.

Preop Plan

The primary goals of treatment were to reduce the articular alignment, stabilize the fracture, and decompress the median nerve. Dr. Bindra recommended revision ORIF to remove the existing implants, joint reduction via a dorsal approach, and internal fixation with the Acu-Loc® 2 Volar Distal Radius (VDR) Plate. He would then perform neurolysis of the median nerve around the fracture site and release the carpal tunnel. The dorsal void would be filled with a bone substitute.

Operative Findings and Approach

Dr. Bindra used the existing surgical scar to develop a modified Henry approach through the floor of the flexor carpi radialis (FCR) tendon. The median nerve was released from scar tissue and existing implants were removed. He then made a dorsal incision between the second and fourth extensor compartments after mobilizing the extensor pollicis longus (EPL) tendon. After gaining visualization of the radiocarpal articular surface via a transverse arthrotomy, the distal articular surface was carefully disimpacted, mobilized into a reduced position, and held with temporary K-wires.

Attention was then turned to the volar incision. Dr. Bindra positioned a standard-sized Acu-Loc 2 VDR Plate to buttress the volar cortex and placed a nonlocking screw through the slotted shaft hole to secure the plate with the attached targeting guide. The plate position was adjusted using both intraoperative imaging and the radiopaque markers in the targeting guide to ensure the distal screws would support the articular surface. This also helped the plate to adequately support the volar ulnar teardrop fragment and radial styloid. Once in place, Dr. Bindra inserted two radial styloid screws to support the radial column. Locking distal screws and nonlocking proximal screws completed the construct. The dorsal metaphyseal defect was then filled with calcium phosphate bone void filler and the carpal tunnel released through a separate incision in the palm. The surgery went as planned and took a total of 95 minutes.

Preoperative



Postoperative



Follow-up

Postoperatively, the patient was placed in a custom thermoplastic splint for a total of six weeks. He was allowed to remove the splint six times a day for exercises, starting two weeks after surgery. Radiographs showed normal radial height and angulation, and radiocarpal articular surface congruity was restored. The patient resumed light activities after two weeks and normal activities by six weeks. At the 12-week follow-up, the patient had achieved 50° of flexion, 60° of extension, and full pronation/supination. He recovered normal median nerve function. No soft tissue complications were seen.

Discussion

When the patient presented to Dr. Bindra after fracture fixation had already been performed elsewhere, the decision for revision ORIF was not taken lightly. In this case, the median nerve needed urgent attention. The articular surface was partially healed and still needed to be disimpacted and reduced under vision by a dorsal approach. Dr. Bindra chose the Acu-Loc 2 VDR Plate due to both its contoured shape that helps buttress the volar fragments and its spread of the screws in the metaphysis to support the entire articular surface. Its lower profile also allowed it to be placed distally on the radius without prominence to avoid putting flexor tendons at risk of irritation. Additionally, the trajectory of the distal screws offered subchondral support, and the two locking screws directed into the radial styloid provided rotational and axial stability to the comminuted fragments.



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www.acumed.net

Acumed USA Campus
5885 NE Cornelius Pass Road
Hillsboro, OR 97124
+1.888.627.9957

OsteoMed USA Campus
3885 Arapaho Road
Addison, TX 75001
+1.800.456.7779

Acumed Iberica Campus
C. de Álvaro Caballero, 14,
28023 Madrid, Spain
+34.913.51.63.57

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