

Adjunctive Dorsal Spanning Plate Fixation for Challenging Distal Radius Injuries

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Purpose: Management of comminuted distal radius fractures remains technically challenging. Specifically, distal radius fracture fixation in the setting of severely osteoporotic bone, salvage procedures, articular comminution, volar rim fractures, and revision cases can be challenging to address with volar locked fixation or dorsal bridge fixation alone. We describe a surgical technique for fixation of distal radius fractures including dual volar locked plate fixation and dorsal bridge fixation.

Methods: We retrospectively identified 9 patients with distal radius fractures who underwent our preferred surgical technique for fixation. Patients underwent volar locked plate fixation as well as dorsal bridge fixation through the second metacarpal at time of surgery. Patients over the age of 18 years who underwent augmented fixation were included in the study. Patient demographics, physical examination findings, as well as radiographic and clinical outcomes were collected.

Results: The average patient age was 53.2 years. Four patients were indicated for severe articular comminution with volar rim fragmentation (44%), 2 patients were revised for nonunion after previous volar locked late fixation (22%), and 3 patients had severely osteoporotic bone with articular comminution (33%). Patients were followed for an average of 7.8 ± 2.3 months. The dorsal bridge plate was removed at an average of 10.2 ± 3.9 weeks. The average postoperative radial inclination was $19.8^\circ \pm 2.3^\circ$, radial height $12.1 \text{ mm} \pm 1.8 \text{ mm}$, and volar tilt $8.7^\circ \pm 2.0^\circ$. There were no cases of deep or superficial infection. After dorsal bridge plate removal, patients demonstrated an average wrist extension of $58.4^\circ \pm 6.1^\circ$, flexion $65.3^\circ \pm 7.2^\circ$, radial deviation $17.1^\circ \pm 3.2^\circ$, and $26.8^\circ \pm 2.1^\circ$ of ulnar deviation.

Conclusion: We provide an alternative fixation method for distal radius fractures involving revision surgery, severely osteoporotic bone, salvage procedures, articular comminution, and volar rim fractures. Our findings demonstrate that such injuries may benefit from adjunctive fixation through radiographic and patient reported outcomes. This allows for fragment-specific fixation and restoration of the articular surface with volar locked plating as well as restoration of length and distraction at the joint surface through dorsal bridge plating. Ultimately this adjunctive, dual-fixation approach should be considered for challenging distal radius fractures.

Figure 1: Pre-Operative (left) and Post-Operative (right) PA and Lateral Radiographs of a Dorsal, Comminuted Distal Radius Fracture Treated with Volar Locked Fixation and Dorsal Bridge Plating.



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