

## Clinical and Radiological Outcomes and Patient Experience Following Orthogonal Dual Plating for Displaced Midshaft Clavicle Fractures at Minimum 2-Year Follow-up

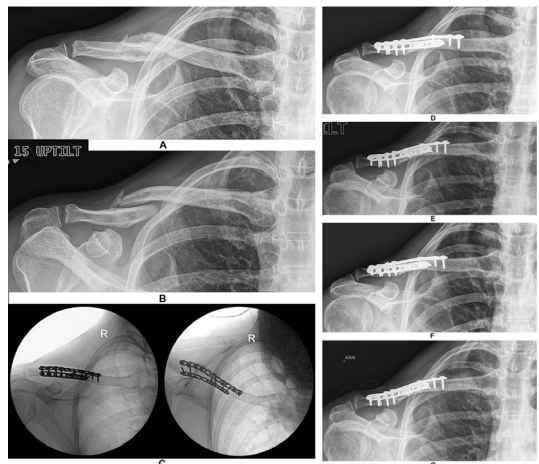
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**Purpose:** Orthogonal dual mini-fragment plating has been increasingly used for treatment of displaced midshaft clavicle fractures. The study purpose was to assess clinical outcomes and patient satisfaction following this technique with minimum 2-year follow-up in cohorts of patients with acute fractures and nonunions of midshaft fractures.

**Methods:** All patients undergoing orthogonal mini-fragment dual plating for acute fractures and nonunions of displaced midshaft clavicle fractures (AO/OTA Type 15.2) between 2008-2020 and with minimum 2-year follow-up were included. Medical records were examined for patient characteristics and union, and patients were sent a general questionnaire, VAS (visual analog scale) pain, QuickDASH (an abbreviated version of the Disabilities of the Arm, Shoulder and Hand [DASH] questionnaire) and SF-12 (Short-Form 12) questionnaires. Data were reported in mean with standard deviation or median with interquartile range depending on normal distribution of data, and statistical tests were used accordingly.

**Results:** A total of 108 patients were included with mean 5 ( $\pm 2$ )-year follow-up, of whom 78 patients had surgical treatment for acute fractures and 30 underwent nonunion surgery. Mean age was 43 ( $\pm 18$ ) years and 66% were male. Union was achieved in 77 patients (99%) with mean time to union of 10 ( $\pm 3$ ) weeks in the acute fracture cohort and in 29 patients (97%) with mean time to union of 12 ( $\pm 3$ ) weeks in the nonunion cohort. Three patients (4%) underwent revision surgery in the acute fracture cohort, 1 for nonunion, and 2 for refracture after new trauma, while 1 nonunion patient (3%) underwent revision surgery for recalcitrant nonunion. Four patients with acute fractures (5%) and 5 with nonunions (17%) underwent hardware removal due to symptomatic hardware. Patients were highly satisfied with the overall treatment (92% for acute fractures versus 84% for nonunions). Median outcome scores for acute fractures and nonunions, respectively, were: VAS pain 0 (range, 0–0) and 0 (0–27); QuickDASH 0 (0–0) and 1 (0–2); SF-12 physical 57 (55–57) and 53 (49–55); and SF-12 mental 56 (51–58) and 56 (52–60). Patients with acute fractures had earlier time to union ( $P = 0.002$ ), better QuickDASH scores ( $P = 0.019$ ), and higher physical SF-12 scores ( $P = 0.035$ ).

**Conclusion:** Orthogonal mini-fragment dual plating of acute fractures and nonunions of displaced midshaft clavicle fractures consistently leads to osseous union, patient satisfaction, excellent patient-reported outcomes, and low rates of secondary surgery for symptomatic hardware. These small, low-profile plates minimize hardware irritation while allowing excellent multiplanar stability in both acute fractures and nonunions of the clavicle.



See the meeting website for complete listing of authors' disclosure information. Schedule and presenters subject to change.