

Single Mini-Fragment Plate Fixation for Displaced Midshaft Clavicle Fractures May Be Associated With Higher Rates of Reoperation

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Purpose: Displaced midshaft clavicle fractures are common injuries. Questions remain regarding the optimal method of surgical fixation. Previous studies have shown a possible reduction in reoperation rate with the use of dual plate fixation compared to single plate fixation. The goal of this study was to assess risk for reoperation based primarily on fixation method including use of single or double plating techniques and/or mini or small fragment plates.

Methods: A retrospective query of all adult patients who sustained displaced midshaft clavicle fractures from 2016 to 2020 at a single Level I trauma center was performed. Patients with a minimum follow up less than 1 year were excluded. Remaining patients were stratified into two groups based on presence or absence of reoperation as indicated for either symptomatic hardware or mechanical failure. Demographics, fracture characteristics, and fixation method including plate number and configuration were compared between groups in the form of a retrospective case control study.

Results: A cohort of 173 patients (mean age: 42.6 ± 15.7 years) was identified with mean follow up of 54.5 ± 22.7 months. A total of 24 patients underwent reoperation. Patients who underwent fixation with a single plate neared significance for increased risk of reoperation compared to dual plate configurations (OR: 3.46; 95% CI: 0.99–12.2; $p = 0.053$). On subgroup analysis, patients who underwent fixation with a single anterior mini-fragment 2.7 mm plate compared to dual mini-fragment plates had 6.70 times increased odds of reoperation (95% CI: 18.4–24.4; $p = 0.004$). Of patients ($n = 16$) who underwent reoperation with index surgery including a single mini-fragment plate, 50% underwent revision for symptomatic hardware while the other 50% underwent revision for mechanical failure.

Conclusion: Patients who sustain displaced midshaft clavicle fractures and undergo surgical fixation with a single mini-fragment plate (2.7 mm) may be at an increased risk for return to the operating room for revision surgery. Indications for revision surgery may include both symptomatic hardware and mechanical failure.

Further study of these findings may guide both surgeons and patients in surgical management of these injuries.