Dual Plating Fixation of "High-Risk" Distal Fibula Fractures Allows for Reliable Early Weightbearing Without Fixation Failure

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Purpose: Ankle fractures are one of the most common injuries treated by orthopaedic surgeons. Rates of fixation failure in operatively treated ankle fractures are substantially greater in osteoporotic bone and comminuted fracture patterns. Dual plating for "complex" fibula fractures has been demonstrated to be a cost-effective strategy. This study seeks to assess whether fibula fracture dual plating allows for early weightbearing in "high-risk" ankle fractures without fixation failure.

Methods: After IRB approval, a retrospective chart review was conducted for consecutive patients presenting to a tertiary referral center for evaluation of acute ankle fracture by a single surgeon. 270 patients presented with 270 ankle fractures (AO/OTA 43A-C) from December 2016 through December 2020. During this time, 222 patients were treated with single plate fibula fixation and delayed weightbearing. 48 patients with high-risk fibula fractures were treated with fibula dual plating, full weightbearing at 2 weeks postoperatively. Patient outcomes included time to union, minor and major complications, 30-day readmission, reoperation, and length of stay. Univariate and multivariate analyses were conducted to identify significant differences between cohorts (significance designated as $P<0.05$).

Results: Patient characteristics between cohorts were not different with respect to injury types, mechanism, gender, or laterality. Body mass index, and preoperative American Society of Anesthesiologists classification among the dual plating and single plating cohorts did not differ significantly ($P = 0.29$ and $P = 0.85$, respectively). The mean age of patients in the dual plating cohort was greater than that of the single plating cohort (54.8 ± 19.0 years vs 45.9 ± 16.8 years, $P = 0.0041$). Mean clinical follow-up was 12.3 months. Outcomes including time to union, complications including fixation failure, readmission, reoperation, and length of stay were not significantly different between groups ($P>0.05$).

Conclusion: Osteoporosis, fracture comminution, neuropathy, and patient noncompliance are distinctive of "high-risk" fibula fractures. These characteristics present a greater risk of fixation failure and loss of reduction. Patient adherence to postoperative weightbearing restrictions typical for ankle fracture open reduction and internal fixation in this patient population is often poor. Dual plating for these high-risk fibula fractures allows for reliable early weightbearing without increased risk of complications including fixation failure and loss of reduction.