Open Reduction and Provisional Pinning of the Syndesmosis in Rotational Ankle Fractures

Levonti Ohanisian, MD*; Noah M. Joseph, MD; Joseph Michalski, MD; Christopher Flanagan, MD; Hassan R. Mir, MD, MBA, FIOTA*

Purpose: Controversy persists regarding the optimal surgical technique for repairing syndesmotic injury in ankle fractures although it is well established that reduction quality significantly impacts outcomes. There remains a paucity in the literature describing effective methods in syndesmotic repair. We aimed to describe outcomes following a novel approach to open syndesmotic repair with direct visualization and provisional pin fixation prior to syndesmotic implant placement.

Methods: 83 consecutive ankle fractures (AO/OTA 44B/C) with syndesmotic injuries treated surgically using an open repair technique over a 3-year period were retrospectively reviewed. Open repair involved direct visualization and provisional pinning of the syndesmosis prior to syndesmotic implant placement based on the anatomic congruency between the lateral tibial plafond, superolateral talus, and medial distal fibula ("Mercedes Benz" sign). Demographic and treatment-related characteristics were collected. Complications were recorded, with particular attention to rate of syndesmotic screw breakage and symptomatic screw removal. Functional outcomes assessment was obtained via PROMIS (Patient-Reported Outcomes Measurement Information System) physical function (PF), pain interference (PI), global mental health (GMH), and global physical health (GPH) scores.

Results: The cohort comprised primarily women (54.2%) with mean age 51.4 years. 22% were diabetic, 19.3% were tobacco users, and a significant proportion had moderate or severe Charlson Comorbidity Indices (19.3% and 14.5%, respectively). Most patients sustained 44B fractures (69.9%) after ground level falls (50.6%). 24% were open fractures. Mean time to weightbearing was 83.8 days. Syndesmotic screw breakage occurred in 8 patients (9.6%); however, there were none who developed symptomatic screws requiring removal. Other recorded complications included superficial infection (1, 1.2%), deep infection (4, 4.8%), and nonunion (3, 3.6%). Ankle dorsiflexion at final visit averaged 13.6°. 28 patients completed PROMIS evaluations at minimum 12 weeks from surgery with mean PF, PI, GMH, and GPH scores of 37.3, 61.2, 49.8, and 45.9, respectively.

Conclusion: We found that direct visualization and provisional pin fixation optimized reduction quality and resulted in a low rates of syndesmotic screw breakage and no symptomatic syndesmotic screw removal. PROMIS scores provide a benchmark for comparison in future work. Further prospective study is warranted to elucidate differences in functional outcomes between syndesmosis reduction techniques.