Does Deltoid Ligament Repair Reduce Complications and Improve Functional Outcomes Measured by PROMIS Scores Following Ankle Fracture Surgery?

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Purpose: Deltoid repair (DR) in ankle fracture surgery remains controversial. We sought to determine whether DR reduces complications and improves functional outcomes measured by Patient Reported Outcomes Measurement Information System (PROMIS) computerized adaptive tests (CATs) of physical function (PF) and pain interference (PI). We hypothesized that DR would reduce complications and improve PROMIS scores.

Methods: This was a retrospective study of 782 patients at a single institution who underwent ankle fracture surgery from 2016 to 2021. Two fellowship-trained foot and ankle orthopaedic surgeons independently reviewed all radiographs and assessed reduction quality and complications at final follow-up. Multiple extremity injuries, open fractures, and pilon variants were excluded. All 345 patients with deltoid ruptures were sent PROMIS CATs. 265 patients with minimum 1-year follow-up were analyzed for complications. 112 patients who completed CATs were analyzed for functional outcomes. The Wilcoxon Rank Sum test compared PROMIS scores between groups. Linear regression modeled the effect of DR on PROMIS. This study had 80% power to detect a large effect size (Cohen's d=0.68).

Results: 50/265 (18.9%) underwent DR. Radiographic complications incidence among 215 patients (81.1%) without repair was 14.42%: seven (3.26%) degenerative joint disease, three (1.40%) ankle joint malreduction, four (1.86%) syndesmotic malreduction, and eight (3.72%) malleolar malunion. The DR group had no radiographic complications. Among patients who completed CATs (n = 112), DR (n = 21) had non-significantly higher mean PF (54.31 ± 9.83 vs 52.79 ± 10.42, p = 0.71) and non-significantly lower mean PI (47.21 ± 7.82 vs 48.53 ± 8.37, p = 0.59). Adjusted regression models estimated 1.89-point increase in PF and 1.67 decrease in PI for DR versus no repair.

Conclusion: DR reduces complications following ankle fracture surgery, likely due to improved ankle stabilization and alignment. Although this study was underpowered to detect small effect sizes in PROMIS PF and PI, small improvements in functional outcomes observed in our study suggest DR may improve patient-reported outcomes. Unlike patients without DR, patients with DR achieved higher PROMIS PF in the minimal clinically important difference range reported in the literature for this outcome measure compared to the population mean score of 50.