

### Functional Outcomes of Syndesmotic Injuries Based on Objective Reduction Accuracy at Minimum 1-Year Follow-up

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**Purpose:** Despite the perceived importance of anatomic syndesmotic reduction and fixation, malreduction rates (as detected by CT) are reported to be between 15% and 52%. A malreduction threshold of 1-2 mm has been used arbitrarily, yet it is unknown which malreduction characteristics can be tolerated and to what degree before a clinically significant change is noted. The purpose of this study was to objectively evaluate the relationship between specific syndesmotic reduction characteristics and clinical outcomes using validated patient-reported questionnaires.

**Methods:** A cohort of patients with unilateral operatively treated syndesmotic injuries were consented and prospectively enrolled. As part of a standardized postoperative protocol, patients underwent bilateral ankle CT scans to assess the syndesmotic reduction. Standardized measurements were taken using previously described protocols. 69 patients were enrolled. Nine were excluded perioperatively. Of the remaining 60 patients, 12 were lost to follow-up leaving 48 (80%) with a minimum 1-year follow-up. Olerud-Molander Ankle Score, Short Musculoskeletal Function Assessment, and Numeric Pain Rating Scales were collected at a minimum 1-year follow-up.

**Results:** There were measured malreductions of at least 2 mm or 10° in 31 patients. There were measured malreductions of at least 3 mm or 15° in 14 patients. There was a single patient with a linear malreduction of >4 mm (5.4 mm). There were no measured rotational malreductions >20°. We were unable to demonstrate significant differences in functional outcomes at 1-year follow-up based on measured malreductions for each measured malreduction threshold. For linear measurements at the 1.5-mm, 2-mm, and 3-mm malreduction threshold, and angles 1 and 2 at a 10° rotational malreduction threshold, there was no significant differences between reduced and malreduced groups in all outcome scores at 1-year follow-up. Medicaid patients reported significantly worse outcome scores when compared to those with private insurance, Medicare, and those completely uninsured.

**Conclusion:** In our cohort, we were unable to find clinically important patient-reported outcomes differences between reduced and malreduced groups with a threshold of 2 mm at 1-year follow-up.