Outcomes of Midfoot Arthrodesis After Failed Primary ORIF: Should We Be Primarily Fusing Every Lisfranc?

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Purpose: Anecdotal evidence suggests patients who require midfoot arthrodesis following initial treatment of a Lisfranc injury via open reduction and internal fixation (ORIF) fare worse than those treated with an index arthrodesis. Minimal data exist comparing primary arthrodesis (PA) to those requiring secondary arthrodesis (SA). The purpose of this study was to compare clinical and radiographic outcomes of patients who underwent PA versus SA following ORIF of their Lisfranc injury.

Methods: We retrospectively identified skeletally mature patients from 1 Level I trauma center surgically treated for Lisfranc injuries between 2002-2023. Patients who underwent index PA of their Lisfranc injury were compared to those who underwent index ORIF and subsequent SA. Clinical and radiographic outcomes were combined to a composite primary outcome; secondary outcomes were Patient-Reported Outcomes Measurement Information System (PROMIS) measures of physical function (PF) and pain interference (PI). Descriptive statistics, multivariable analysis, and logistic regression were utilized to compare and describe groups, determine confounder effects, and ascertain effects of treatment on outcomes.

Results: We identified 489 feet with Lisfranc injuries. Index treatment for 98 was PA. 34 SAs were required (8.7% of index ORIF group). Average age at time of fusion was 37.7 years (standard deviation [SD] 15.6), with mean follow-up of 2.3 years (SD 8.8). Patients who underwent a secondary fusion were more likely to develop poor (21.9% vs 6.5%, P = 0.021; odds ratio [OR] 5.1, confidence interval [CI] 1.4-18.5) or severe outcomes (12.5% vs 1.1%, P = 0.015; OR 12.7, CI 1.1-12.8) compared to those who underwent PA. Patients requiring SA also had significantly higher maximum PI and lower PF than non-SA peers by over 5 points at final follow-up (P = 0.018, P<0.001). Divergent injuries and index tightrope treatment had higher odds of needing a subsequent fusion (OR 6.9, P = 0.006; OR 4.6, P = 0.003).

Conclusion: In this large investigation of salvage arthrodesis after Lisfranc ORIF, 9% of patients who underwent index ORIF of their Lisfranc injury required a secondary fusion, and fared substantially worse than those treated with a primary fusion. Index treatment with primary arthrodesis should be considered. Further work is needed for more clear delineation of risk factors for SA.