

Medical and Social Factors Are Primary Determinants of Patient-Reported Functional Outcomes After Lisfranc Injury

Alexander J Benedick MD; Michael Kavanagh BA; Nicholas Alfonso MD; Heather A Vallier MD
MetroHealth System, Cleveland, OH, United States

Purpose: Limited prior work has investigated patient-reported functional outcomes after Lisfranc injuries. The purposes of this study were to evaluate predictors of functional outcomes following operative treatment of Lisfranc injury and to compare outcomes with other types of lower extremity fractures.

Methods: 129 adults with tarsometatarsal fractures and dislocations treated surgically at a single Level-I trauma center between 2000 and 2018 were identified. Reduction and fixation were performed using standard techniques of rigid medial fixation and flexible lateral fixation. Those who underwent amputation as treatment were excluded ($n = 19$). Patient-reported outcomes using the Foot Function Index (FFI) and Short Musculoskeletal Function Assessment (SMFA) were collected at least 1 year later. Multiple linear regression was performed to identify potential predictors of outcomes, including demographics, comorbidities, and injury characteristics.

Results: A total of 45 patients (40.9%) with mean age 39.7 years (range, 18-73) and 58% male completed functional outcome surveys after a mean of 8.7 years follow-up. Mean SMFA scores were 29.3 for dysfunction and 32.6 for bothersome, indicating substantial dysfunction. Mean FFI scores were 43.1 for pain, 43.0 for disability, and 21.7 for activity, with mean total score of 35.9. FFI pain scores were higher (worse) than published mean values for fractures of the plafond (33.0, $P = 0.04$), distal tibia (33.0, $P = 0.04$), and talus (25.3, $P = 0.001$). Lisfranc injury patients also reported worse disability (43.0 vs 29, $P = 0.008$) and total FFI scores (35.9 vs 26, $P = 0.02$) compared to those with distal tibia fractures. Tobacco use was an independent predictor of worse FFI ($P < 0.05$) and SMFA emotion and bothersome scores ($P < 0.04$). Renal disease was also a predictor of worse FFI disability scores ($P = 0.04$) and all SMFA subcategory scores ($P < 0.04$). Male sex was associated with significantly lower (better) scores in all SMFA categories ($P = 0.002-0.04$) but was not associated with FFI scores ($P > 0.10-0.26$). Age, obesity, or open injury did not affect functional outcome scores.

Conclusion: To our knowledge, this is the largest series reporting functional outcomes following Lisfranc injury. Both generalized and extremity-specific instruments demonstrated substantial residual dysfunction after a mean of several years following injury. Patients reported worse pain by FFI after Lisfranc injury compared to other fractures about the foot and ankle. Tobacco use, female sex, and preexisting renal disease are predictive of worse outcome scores, warranting counseling of patients about long-term functional sequelae of their injury.