

Complications and Outcomes After High-Energy Lisfranc Injuries*Alexander J. Benedick, MD; Michael Kavanagh, MD; Nicholas Alfonso, MD;**Heather A. Vallier, MD**MetroHealth System, Cleveland, OH, United States*

Purpose: Lisfranc tarsometatarsal fractures and dislocations are uncommon injuries, most resulting from high-energy trauma. Reduction and fixation are recommended to restore alignment and to promote function. The purpose of this study was to evaluate patient and injury features and to describe potential associations with early and late complications and secondary operations.

Methods: 160 consecutive adults with tarsometatarsal fractures and dislocations at a single Level I trauma center from 2000 to 2018 were identified from a fracture registry. Reduction and fixation were performed using standard techniques of rigid medial fixation and flexible lateral fixation. Complications included infections, wound healing problems, nonunion, malunion, and posttraumatic arthrosis (PTA). Secondary unplanned procedures were documented.

Results: 129 patients with mean age of 39.6 years (range, 18-73) and 74% (n = 96) male were included. Comorbidities included obesity (n = 45, 34%), diabetes mellitus (n = 12, 9.3%), and tobacco use (n = 67, 52%). The majority occurred via high-energy mechanisms, including motor vehicle collisions (30%), motorcycle crash (21%), falls from height (18%), and crush injuries (13%); only 8.7% occurred via ground level fall. 30 (23%) were open injuries, all Gustilo and Anderson type 3: (3A = 6, 3B = 18, 3C = 6), and concomitant forefoot injuries were present in 47% and hindfoot injuries in 12%. 13 patients (10%) underwent amputation acutely due to unsalvageable injury. Unplanned secondary procedures were performed on 30 of the remaining 116 patients (27%), most often for removal of painful or prominent implants (15%), infectious debridement (8.0%), and amputation due to late infection or wound healing complications (5.3%). A total of 70 complications occurred in 44 patients (38.9%), with PTA occurring most frequently (34.8%). Deep infections occurred in 7.8% of patients and superficial wound infections occurred in 3.4% of patients. Nine patients went on to malunion, while 3 failed to achieve union. Deep wound infections occurred more frequently with open injuries (33.3% vs 3.2%, $P < 0.001$).

Conclusion: Midfoot fracture dislocation injuries are most often the result of high-energy mechanisms. Open and/or unsalvageable injuries requiring amputation are common. Modest rates of postoperative infection and wound healing complications are seen with these injuries. Secondary procedures were most often performed for pain relief and the most common late complication was PTA, warranting counseling of patients about the long-term sequelae of their injury.