

# **Open Reduction Internal Fixation of Tarsometatarsal (Lisfranc) Fracture Dislocations &dash; Is Arthrodesis Necessary?**

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## **INTRODUCTION:**

Controversy remains regarding optimal management of tarsometatarsal (Lisfranc) fracture dislocations. Open reduction internal fixation (ORIF) and ORIF with primary arthrodesis (PA) have been described in treatment of these injuries though adverse sequelae remain problematic. Prior work has yielded small cohorts with heterogenous results. We aimed to describe outcomes of Lisfranc fracture dislocations managed with ORIF and/or PA to identify risk factors for complications, such as nonunion, reoperation, and secondary arthrodesis.

## **METHODS:**

Retrospective review of 206 consecutive unstable tarsometatarsal fracture dislocations that underwent surgical repair between 2015 and 2021 was performed. Demographic and treatment-related characteristics were collected. Time to radiographic union was noted. Complications were recorded, including reoperation, infection, symptomatic implant removal, symptomatic posttraumatic arthritis, secondary arthrodesis, and nonunion. Comparative subgroup analysis of outcomes by treatment modality (i.e., PA vs. ORIF) and by injury severity (isolated injury vs. concomitant lower extremity fracture) were performed. Logistic regression analysis was performed to assess factors associated with reoperation.

## **RESULTS:**

A total of 104 patients met inclusion criteria with mean 387-day follow up. The cohort comprised primarily men (54.8%) with mean age 44 years. Eleven percent were diabetic, 27.9% were smokers, 26.9% had psychiatric illness, and most had Charleston Comorbidity Indices <3. Most patients sustained Myerson A (57.7%) or B (34.6%) injuries. Twenty-five percent sustained open fractures and 36 sustained concomitant lower extremity fractures. Eleven patients underwent PA. Fixation constructs included trans-articular screws (34.6%), dorsal bridge plating (29.8%), or a combination of both (35.6%). Radiographic union was achieved in 94.2% of cases (98/104) with average 106 days to union. Complications included superficial infection (3.8%), deep infection (7.7%), symptomatic implant removal (19.2%), symptomatic posttraumatic arthritis (12.5%), secondary arthrodesis (4.8%), and nonunion (2.9%). There was no difference in complication rates between those who underwent ORIF and those who underwent PA (p=0.50). Reoperation rates were similar between patients who sustained isolated injuries versus those with concomitant lower extremity fractures (p=0.31). Risk factors for reoperation included open fractures (OR 4.01, p=0.042), and prior psychiatric illness (OR 5.77, p=0.016).

## **DISCUSSION AND CONCLUSION:**

The vast spectrum of injury in Lisfranc fracture dislocations makes uniform treatment challenging. In this large consecutive series, few failed to achieve union or required secondary arthrodesis. Open fractures and prior psychiatric illness portended worse clinical outcomes. ORIF without PA remains a viable treatment in these injuries.