

High-Energy Midfoot Fracture-Dislocations: Does Staged Treatment with External Fixation Help?

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Purpose: High-energy Lisfranc fractures are often associated with significant malalignment and soft-tissue trauma leading to delayed fixation. The purpose of this study is to analyze the clinical outcomes of patients treated for high-energy midfoot (Lisfranc) injuries with temporary surgical stabilization prior to definitive surgical fixation, with particular detail to soft-tissue complications compared to a control group treated initially with splint only.

Methods: We evaluated patients at 3 Level-I trauma centers with high-energy Lisfranc injuries reduced and temporized (TS) with an external fixator (EF) or percutaneous pinning (PP) prior to definitive fixation. We then compared to a matched control group (C) of high-energy Lisfranc injuries treated with splint only. The definitive surgical stabilization was either open reduction and internal fixation (ORIF) or arthrodesis at the discretion of the surgeon. Clinical parameters, complications, and need for additional surgery were evaluated. Descriptive statistics and nonparametric tests were used.

Results: There were 15 patients in group C and 29 patients with temporary stabilization (TS). The average age of both groups was 36 years (range, 17-78). The average time to definitive surgical stabilization was 10 days in the C group and 21 days in the TS group ($P < 0.01$). 12 of 15 patients in group C were treated with ORIF while 21 of 29 patients in the TS group were treated with ORIF (NS [nonsignificant]). The nonunion rate was 2/15 in group C and 5/29 in the TS group (NS) ($P = 0.55$). The average time to full weight bearing was 3.2 months in group C and 4.2 months in the TS group ($P < 0.02$). There were 13 additional surgeries in the C group, including 8 for removal of hardware (ROH) and 1 conversion from ORIF to fusion. There were 23 additional surgeries in the TS group including 16 ROH and 3 conversions from ORIF to fusion. There was no significant difference in additional operations between the C and TS groups ($P = 0.35$).

Conclusion: High-energy Lisfranc injuries treated with TS resulted in a longer delay to definitive surgery and full weight bearing compared to controls. This may be due to higher energy injury and skin compromise in those patients who had TS. Definitive stabilization with either ORIF or arthrodesis produced similar results in treatment of these injuries. Both the TS and C groups demonstrated no significant difference in the number of additional operations, infection rate, incidence of deep vein thrombosis, nonunion, or need for orthotics postoperatively ($P > 0.05$). The most common secondary surgery was ROH for both groups.