

Limb Salvage and Amputation Outcomes Following Severe Distal Tibia and Hindfoot Injuries

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Purpose: The decision to salvage or amputate a severe distal tibia or hindfoot injury is still under debate. Evidence suggests that some salvage patients may do better with an early below-knee amputation. This cohort study collected functional outcome data on patients undergoing salvage versus early amputation (within 6 weeks) following these injuries. We hypothesized that there would be a subgroup of salvage patients who would have had better outcomes had they undergone amputation.

Methods: 32 US trauma centers enrolled patients (18-60 years of age) with severe injuries to the distal tibia, ankle, or hindfoot and followed them for 18 months. The primary outcome was patient-reported function as measured by the Short Musculoskeletal Function Assessment (SMFA). We compared outcomes for salvage patients to the outcomes these patients would have had, if they had undergone amputation. This causal analysis relies on the assumption that, after accounting for baseline patient characteristics and characteristics of the non-study injury, there are no additional factors that are associated with both an individual's outcome after amputation and the decision to amputate.

Results: The analysis is based on 87 patients undergoing amputation and 408 undergoing limb salvage (170 with open Type III pilon or Type IIIB/C ankle fractures; 85 with open Type III B/C talus or calcaneus fractures; 153 with other severe crush or blast injuries to the foot from high-injury mechanisms). The average age was 38.5 years; 64% were male. Observed SMFA outcomes were uniformly worse across all domains of the SMFA for salvage versus amputation patients (eg, 38.5 vs 29.8 on the mobility subscore). We estimate that for all domains except daily activities, outcomes for salvage patients are significantly worse than had they undergone amputation; differences over all patients were modest (eg, salvage patients have a mobility score that is 7.93 points (95% confidence interval: 3.14, 12.62) higher than their score had they undergone amputation. Results vary by principal injury with the difference being largest for open pilon/ankle fractures. The presence of other ipsilateral injuries contributed to a slightly larger but statistically significant difference in outcome.

Conclusion: This study suggests that for some types of severe foot and ankle injuries, patient-reported outcomes might be better under amputation versus limb salvage. Further analyses comparing objective measures of functional performance are needed.