Do Transtibial Amputations Outperform Amputations of the Hind- and Midfoot Following Severe Limb Trauma?: A Secondary Analysis of the OUTLET Study

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Purpose: Our objective was to compare outcomes of severe lower-extremity injuries treated with transtibial amputation to more distal amputation levels. We hypothesized superior outcomes following transtibial amputation.

Methods: We included patients ages 18 to 60 years enrolled in the Outcomes Following Severe Distal Tibial, Ankle, and/or Mid/Hindfoot Trauma (OUTLET) study that were treated with an amputation. We compared 18-month outcomes of patients with a transtibial amputation to patients with a distal amputation. Short Musculoskeletal Functional Assessment (SMFA) scores were compared with Mann-Whitney tests, and the proportion of patients with surgically treated complications, amputation revision, and healed amputation were compared with $\chi 2$ exact tests.

Results: There were 82 transtibial and 17 distal amputations (5 Symes, 7 tarsometatarsal, 5 transmetatarsal). Groups were similar with respect to preinjury demographic and injury characteristics. A significantly higher percentage of distal amputees had an atypical stump closure compared to transtibial amputees (35% vs 16%, P = 0.008). Surgical complication rates were similar (5/17, 29% vs 12/82, 15%), with 71% of distal and 85% of transtibial amputations healing at the intended level (P = 0.17). Two distal (12%) and 1 transtibial amputee (1%) required revision to a higher level (P = 0.02). Of the amputations that healed at the intended level, 5 (29%) of the distal amputees needed local wound care and 3 (18%) needed local surgical revision, while 6 (8%) of the transtibial amputees needed local wound care and 11 (14%) needed local surgical revision. SMFA scores for the distal and transtibial groups, respectively, were function index 31 versus 23.4, P = 0.18 (Activities of Daily Living 37.3 vs 27.1, P = 0.22; Emotional 41.4 vs 30.8, P = 0.11; Mobility 36.5 vs 28.9, P = 0.27; Arm/Hand 8.7 vs 4.5, p=0.08); Bother index 34.4 versus 25.2, P = 0.20.

Conclusion: Complication rates were similar between patients who underwent transtibial and hind- or midfoot amputation for severe lower-extremity injury. Distal amputations more often required closure with an atypical flap, needed local wound care, and underwent revision to a higher level. While limited by small numbers of distal amputations, the differences between transtibial and distal amputations in most unadjusted (5/6) SMFA subscores were higher by more than the accepted minimal clinically important difference (MCID) of 7 points. Higher scores (distal amputations) indicate worse function. Surgeons should consider these factors when advising patients about amputations at a more distal level.