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

Brianna Fram, Michael J Bosse, Susan Marie Odum[1], Lisa Reider, Ellen MacKenzie[2], Rachel Seymour[3], Madhav A Karunakar, EMIT Collaborative
[1]Atrium Health Musculoskeletal Institute, [2]Johns Hopkins SHPH, [3]Atrium Health

INTRODUCTION: This study is 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 18-60 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-squared Exact Tests.

RESULTS:

There were 82 transtibial and 17 distal amputations (5 Symes, 7 tarsometatarsal, 5 transmetatarsal). Groups were similar with respect to pre-injury 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 (12%) distal and 1 (1%) transtibial amputee 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 vs. 23.4, p=0.18 (ADLs 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 vs. 25.2, p=0.20.

DISCUSSION AND 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.