Outcomes and Final Amputation Level in Patients Presenting With Traumatic Lower Extremity Amputations

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Purpose: Patients presenting with traumatic lower extremity amputations frequently undergo amputation more proximal than the initial injury because of contamination or to achieve soft-tissue coverage. This study aims to define risk factors for more proximal amputation and for infection following definitive closure.

Methods: A retrospective chart review was performed of patients presenting with a traumatic lower extremity amputation at a single Level I trauma hospital between January 2005 and April 2024. Patients younger than 18 years or without an acute fracture in the amputated limb were excluded. Mechanism of injury, time to antibiotics, time to debridement, and final amputation level were recorded. Computed tomography angiography (CTA) abnormalities, tourniquet present on arrival, gross contamination, ISS, and body mass index (BMI) were compared using Fisher's exact and Mann-Whitney non-parametric tests. Statistical significance was defined as $p<0.05$.

Results: In the final analysis, 86 patients with an average age of 44.9 ± 16.9 years were included. Higher rates of above-knee amputation (53%) versus below-knee amputation (30%) were associated with tourniquet present on arrival ($p = 0.022$). There was no significant difference in requirement for revision amputation or subsequent surgical debridement between above- and below-knee amputations ($p = 1.0$). Patients requiring subsequent debridement were more likely to have higher mean BMI (31.5 ± 7.5) compared to those not requiring it (27.2 ± 6.7; $p = 0.007$), but the number of vessels present on CTA, time to debridement, time to antibiotics, and the presence of gross contamination did not significantly increase the need following final closure. Patients with a below-knee amputation (74%) were more likely to be ambulatory at final follow up compared to those with above-knee amputations (50%; $p = 0.033$).

Conclusion: These results suggest a tourniquet present on arrival is the only risk factor for a more proximal level of amputation. Increased BMI was the only significant risk factor for subsequent debridement, suggesting the quality of surgical debridement may have a greater impact on outcomes than injury characteristics.