

Function After Traumatic Amputation of the Lower Extremity: What Are the Predictors of Better Outcome?

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Purpose: Prior studies have described dysfunction and poor functional outcomes following lower extremity amputation. The purpose of this study was to identify risk factors associated with postoperative complications and poor functional outcomes and to characterize narcotic medication usage, employment status, and mental illness.

Methods: A retrospective review was conducted at a single Level I trauma center of adults who were treated acutely with lower extremity amputations for injury (TFA [transfemoral amputation], TTA [transtibial amputation]). Medical records from a 10-year period (2003 to 2013) were evaluated and yielded 588 lower extremity amputation patients. Of these, 411 patients were excluded as non-trauma-related. 33 of the remaining 147 patients were excluded (11 died during hospitalization, 13 had amputation prior to period of study, 9 had no clinical follow-up). Charts and radiographs were reviewed. Postoperative complications included infections, wound dehiscence, deep vein thrombosis, and pulmonary embolus. Patients were contacted by a trained investigator not involved in their care to complete a Musculoskeletal Function Assessment (MFA) questionnaire and other survey questions regarding social and mental health characteristics.

Results: 114 patients underwent 116 lower extremity amputations with mean clinical follow-up of 42.5 months. Mean age was 43.4 years and 83% were male. Amputations included 74 TTAs (1 bilateral), 38 TFAs (1 bilateral), and 2 knee disarticulations. 116 complications occurred in 76 patients (67%), and 38 patients (33%) underwent 62 secondary procedures. Complications were more common after TFA (78% vs. 38% after TTA, $P = 0.001$). Deep infection occurred in 46% after TFA and 25% after TTA, $P < 0.0001$. 92% of patients used prostheses to ambulate, but 74% reported persistent phantom limb pain, and 67% were using chronic pain medication (more than 3 months after injury), with 42% on narcotics, and 69% on narcotics and other prescription analgesics. Tobacco smokers were more likely to use chronic narcotic medication than nonsmokers ($P = 0.016$). At most recent follow-up only 28% were employed, and 50% of all previously employed patients were either unemployed or working at a reduced level due to injury. Prior to injury 15% reported history of mental illness, while 61% had documented mental illness afterward, most commonly depression (86% of all patients with post-injury mental illness). Mean MFA score for all patients was 37.7 (range, 5 to 68) after mean 58.5 months follow up. Worse MFA scores were noted in patients with diagnosed mental illness (43.2 vs. 26.0, $P < 0.0001$).

Conclusion: The majority of amputees following trauma experience postoperative complications, more common after TFA versus TTA. Deep infections occur frequently. Most patients developed mental illness or experienced worsening thereof after injury, which was associated with poor MFA scores. A majority of amputees required chronic narcotics, and only 28% were employed. This information may help to identify individuals at risk for poor outcomes to develop individualized treatment plans and system resources to mitigate complications, and to address pain management and mental illness in order to optimize recovery.

See pages 99 - 147 for financial disclosure information.