

Patient and Surgical Factors Associated with Fasciotomy in Adults After Tibia Fracture*Jeremy Shaw, MD, MS; David Sing, BS; Brian Feeley, MD; Alan Zhang, MD**University of California, San Francisco, San Francisco, California, USA*

Purpose: Previous analysis of patient and surgical factors associated with fasciotomy after tibia fracture is inadequate. The purpose of the present study is to analyze patient and surgical factors associated with fasciotomy after tibia fracture and to examine complications using a large insurance database.

Methods: A retrospective cross-sectional analysis of patients who underwent surgical treatment for tibial fractures was performed using data from the Nationwide Inpatient Sample (NIS). All available data from 1998 through 2011 were queried. Patients admitted for a primary diagnosis of tibial fracture and who underwent an open reduction and internal fixation (ORIF), intramedullary nail fixation (IMN), or external fixation (Ex-Fix) were identified using ICD-9 coding. Patients were assigned to fracture fixation groups based on definitive surgery. Comorbidities and perioperative complications were recorded and analyzed. Descriptive statistics and multivariate analysis were used to analyze differences between various subgroups within the cohorts.

Results: Between 1998 and 2011, 83,403 had surgical treatment for tibia fracture. 60.7% were male and 39.3% were female. 2921 (3.5%) were treated with fasciotomy for compartment syndrome. Rate of fasciotomy decreased with age, with patients younger than 25 having a higher rate of fasciotomy than other age groups (compared to age 45-55: odds ratio [OR] 1.41, $P < 0.001$). Male gender was strongly associated with fasciotomy after fracture fixation (OR 2.09, $P < 0.001$). Medicaid patients were more likely to require fasciotomy than those with private insurance (OR 1.25, $P < 0.001$). 19,029 patients (22.8%) had a closed tibial shaft fracture, 8711 (10.4%) had open tibial shaft fractures, and 33,278 patients (39.9%) had a single diagnosis of closed proximal tibial fracture. 66,514 (79.7%) were treated with ORIF, 10,853 (13.0%) IMN, and 6036 (7.2%) Ex-Fix. In multivariate analysis, Ex-Fix was associated with a higher rate of fasciotomy compared to ORIF (OR 2.53, $P < 0.001$), while IMN was no different (OR 0.92, $P = 0.242$). Open and high-energy fractures had the highest proportion of fasciotomy. Fasciotomy rate ranged from 7.24% in open proximal tibia fractures to 1.95% in closed distal tibia fractures. Infection, amputation, and death were more common in patients who underwent fasciotomy (2.8% vs 0.8, 2% vs 0.4%, 1% vs 0.5%, respectively, $P < 0.001$). The fasciotomy group had more in-hospital complications and longer length of stay.

Conclusion: This is the largest study to date examining factors associated with fasciotomy following traumatic fracture of the tibia. Factors associated with fasciotomy included patients younger than 25 years of age, male sex, Medicaid insurance, as well as proximal, complex, and open fractures.