Predictors of Long-Term Functional Outcome in Operative Ankle Fractures

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Background/Purpose: Risk factors associated with short-term functional outcomes in patients with operative ankle fractures have been established. However, no previous studies have reported on the association between these risk factors and long-term functional outcomes. Using the Patient Reported Outcomes Measurement System (PROMIS) physical function (PF) and pain interference (PI) measures, we attempt to identify predictors of long-term functional outcome in patients with operative ankle fractures.

Methods: We retrospectively reviewed a multicenter cohort of patients 18 and older who underwent operative management of a closed ankle fracture from 2001-2013 with a minimum of 2 years follow-up. Patients with posterior pilon variants, Maisonneuve fractures, prior ankle surgery, and chronic ankle fractures were excluded from the study. Patients meeting inclusion criteria were contacted and evaluated using the PROMIS PF and PI computerized adaptive tests. PROMIS scores are standardized to a US population with a mean of 50 and a standard deviation of 10. Higher PF scores represent increased physical function, while increased PI scores are indicative of higher pain. Patient risk factors including sex, age, diabetes, smoking, ASA (American Society of Anesthesiologists) class, BMI (body mass index), education level, ankle dislocation, energy of injury, and fracture pattern were obtained through a retrospective chart review. Univariate and multivariate regression models were developed to determine independent predictors of physical function and pain at long-term follow up.

Results: In total, 199 patients met inclusion criteria. Of those, 142 patients (64 females, 78 males) with a mean age of 52.7 years (SD = 14.7) averaging 6.3 years of follow-up (range, 2-14) participated. Patients had a mean PF score of 51.9 (SD = 10.0) and a mean PI score of 47.8 (SD = 8.45). Multivariate analysis demonstrated that independent predictors of decreased PF score included higher age (β = -0.16, P = 0.03), higher ASA class (β = -10.3, P <0.01), and higher BMI (β = -0.44, P <0.01). Predictors of decreased PI score included higher ASA class (β = 11.5, P <0.01) and lower BMI (β = -0.41, p<0.01). Sex, presence of diabetes, smoking status, education level, presence of ankle dislocation, energy of injury mechanism, and fracture pattern did not independently predict long-term pain or functional outcomes.

Conclusion: At long-term follow-up of operative ankle fractures, increased ASA class, increased BMI, and higher age at time of surgery are independently predictive of decreased physical function. Factors that are associated with increased pain at long-term follow-up include lower BMI and higher ASA class. ASA class had the strongest effect on both physical function and pain. The findings from this study suggest that patients with increased ASA class at the time of surgery may deserve increased counseling regarding expected outcomes following operative intervention.

POSTER ABSTRACTS