

Risk Factors for Thromboembolic Events After Ankle Fracture

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Purpose: Lower extremity fracture has been associated with increased risk of venous thromboembolic events (VTEs). There is limited information available describing which patients are at higher risk for thromboembolic events following ankle fracture. The purpose of this study is to use a large-volume, national database to identify independent risk factors for thromboembolic events after open reduction and internal fixation (ORIF) of ankle fractures.

Methods: Patients who underwent surgery for ankle fracture from 2005 to 2012 were identified in the American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) database. A thromboembolic event was defined as the occurrence of a deep vein thrombosis or a pulmonary embolism within the first 30 postoperative days. A history of heart disease was defined as a history of congestive heart failure, angina, myocardial infarction, cardiac surgery, or percutaneous coronary intervention. Patient characteristics were tested for association with occurrence of thromboembolic events using multivariate analysis.

Results: Of the 4412 ankle fracture patients who met inclusion criteria, 33 patients (0.75%) had a thromboembolic event within the first 30 postoperative days. Thromboembolic events occurred an average of 11.5 ± 9.6 (mean \pm standard deviation) days after surgery. Multivariate analysis found that body mass index (BMI) 30 to 35 kg/m² (pdds ratio [OR] = 4.90; 95% confidence interval [CI] = 1.08 to 22.28; $P = 0.040$), BMI ≥ 35 kg/m² (OR = 4.91; 95% CI = 1.07 to 22.50; $P = 0.041$), heart disease (OR = 3.14; 95% CI = 1.15 to 8.56; $P = 0.025$), and dependent functional status (OR = 2.46; 95% CI = 1.05 to 5.75; $P = 0.037$) were independently associated with the occurrence of a VTE after ankle fracture ORIF (Table 1).

Conclusion: Early thromboembolic events occurred in 0.75% of patients after ORIF of ankle fracture. Patients with increased BMI, heart disease, or dependent functional status may be considered for VTE prophylaxis.

Table 1. Multivariate Analysis for the Association of Patient Characteristics with Occurrence of Thromboembolic Events.

Risk Factor	Odds Ratio (95% CI)	P Value
BMI 30 to 35 vs. BMI <25	4.90 (1.08 to 22.28)	0.040
BMI ≥ 35 vs. BMI <25	4.91 (1.07 to 22.50)	0.041
History of heart disease	3.14 (1.15 to 8.56)	0.025
Dependent functional status	2.46 (1.05 to 5.75)	0.037

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