

Impact of Preoperative Osteoporosis on Short- and Long-Term Complications Following Ankle ORIF: A Multi-Institutional Propensity-Matched Analysis

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Purpose: This study evaluates the relationship between preoperative osteoporosis and postoperative complications in patients undergoing ankle open reduction and internal fixation (ORIF).

Methods: A retrospective cohort study was conducted using multi-institutional electronic medical-derived data to evaluate complication rates following ankle ORIF. Patients who underwent surgery between 2004 and 2022 with a preoperative osteoporosis diagnosis and a minimum of 2 years of follow up were identified using CPT, ICD-9, and ICD-10 codes. Patients were stratified based on osteoporosis status, and a 1:1 propensity-matched analysis controlling for demographics and comorbidities was performed. Complication rates at 90 days and 2 years, including deep infection, hardware removal, nonunion, deep vein thrombosis (DVT), pulmonary embolism (PE), myocardial infarction (MI), stroke, and transfusion, were assessed.

Results: A total of 4190 patients was included in the propensity-matched cohort (2095 with osteoporosis and 2095 controls). At 90 days, patients with osteoporosis had a significantly higher risk of deep infection compared to controls (1.0% vs 0.5%, relative risk [RR]: 2.1, 95% CI: 0.99–4.45, $P = 0.047$). At 2 years, osteoporosis was associated with increased risks of hardware removal (14.2% vs 11.6%, RR: 1.23, 95% CI: 1.05–1.44, $P = 0.011$), deep infection (2.6% vs 1.4%, RR: 1.80, 95% CI: 1.16–2.8, $P = 0.008$), DVT (2.5% vs 1.6%, RR: 1.574, 95% CI: 1.01–2.45, $P = 0.042$), transfusion (3.9% vs 2.3%, RR: 1.673, 95% CI: 1.181–2.372, $P = 0.003$), and stroke (2.8% vs 1.7%, RR: 1.58, 95% CI: 1.039–2.41, $P = 0.031$). No significant differences were observed in nonunion, posttraumatic osteoarthritis, malunion, MI, or PE between groups at either time point ($P > 0.05$).

Conclusion: Preoperative osteoporosis increases the risk of short- and long-term complications after ankle ORIF, including deep infection, hardware removal, DVT, transfusion, and stroke. Surgeons should address these risks and optimize patients preoperatively to reduce complications.