The Impact of Diabetic Neuropathy on Trimalleolar Fracture Outcomes

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INTRODUCTION: Diabetic neuropathy is prevalent amongst orthopedic patients, yet there isn't a clear consensus in the literature about if neuropathy itself affects outcomes, or if negative outcomes associated with neuropathy are attributable to other manifestations of diabetes. The aim of this study was to investigate the impact of diabetic neuropathy on trimalleolar fracture outcomes when compared with both non-diabetic and diabetic patients without neuropathy.

METHODS: This retrospective cohort study utilized the National Readmissions Database from 2016 to 2020. Patients undergoing surgery for trimalleolar fractures were identified using ICD-10 codes, including those with diabetes and diabetic neuropathy. Regression models were employed to compare postoperative outcomes between non-diabetic to neuropathic patients and diabetic to neuropathic patients. Gamma regression assessed total charges and length of stay (LOS). Demographics and comorbidities, measured via the Elixhauser comorbidity index, were controlled for in our analysis.

RESULTS: This study included 78,189 trimalleolar fracture patients; 59,783 (76.5%) patients without diabetes, 13,486 (17.2%) patients with diabetes but without diabetic neuropathy, and 4,920 (6.2%) patients with diabetic neuropathy. When compared to patients without diabetes, patients with diabetic neuropathy had increased odds of medical (Odds ratio (OR) 1.86; p<0.001) and surgical (OR 2.16; p<0.001) complications, including osteomyelitis (OR 3.63; p<0.001) and malunion (OR 4.12; p<0.001). When compared to patients with diabetes, but without neuropathy, patients with diabetic neuropathy again had significantly higher odds of osteomyelitis (OR 2.11; p<0.001) and malunion (OR 2.51; p<0.001).

DISCUSSION AND CONCLUSION: This study found that patients with diabetic neuropathy had higher odds of postoperative complications, such as osteomyelitis and malunion, following surgical fixation of trimalleolar fractures than non-diabetic patients and diabetic patients without neuropathy. Orthopedic surgeons should be aware of the added surgical risk associated with diabetic neuropathy, outside of the impact of diabetes alone.

