

Can We Predict the Need for Reoperation Following Nonunion Repair?

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Purpose: Fracture nonunion surgery is highly complex, and patients may encounter problems that necessitate additional surgery. This study aims to identify factors associated with the need for reoperations in patients treated surgically for a fracture nonunion.

Methods: Over a 12-year period all patients treated surgically for a long bone fracture nonunion were prospectively enrolled in a data base. The registry was reviewed for patients who underwent at least 1 reoperation following their index fracture nonunion surgery for failure to heal, early loss of fixation, infection, or hardware-related symptoms. Planned secondary procedures were excluded. Data collected included reason for reoperation, patient demographics, medical history, and surgical details. Body mass index (BMI), sex, Charlson Comorbidity Index (CCI), high-velocity versus low-velocity injury status, open versus closed injury status, diabetes status, and smoking status were compared between patients who healed after their index fracture nonunion surgery without complication and patients who required a reoperation after their index fracture nonunion surgery. Data analysis was performed using independent samples t tests and χ^2 tests using IBM SPSS statistics.

Results: 500 patient records were reviewed. Of the 483 patients with long bone fracture nonunions followed prospectively with complete data, 381 patients (78.9%) were identified who did not require a reoperation after their index fracture nonunion surgery. There were 102 patients (21.1%) who underwent a reoperation after their index fracture nonunion surgery, which included: failure to heal (14.7%), infection (43.1%), early hardware failure (15.7%), and elective removal of hardware (23.5%). Factors associated with the need for a secondary operation were high velocity and open initial injuries, and injury location. When compared to patients who healed after their index fracture nonunion surgery, patients who underwent at least 1 reoperation had a greater proportion of high-velocity initial injuries (66.0% vs 52.6%; $P = 0.017$) or who had sustained an initial open injury (38.0% vs 23.7%; $P = 0.004$). The patients who underwent reoperations were most likely to have a tibia fracture or a femur fracture (50.0%, 25.5% respectively; $P = 0.015$). Age, sex, BMI, CCI, diabetes status, or smoking status were not associated with the need for reoperation ($P = 0.132$, $P = 0.447$, $P = 0.870$, $P = 0.088$, $P = 0.528$, and $P = 0.064$, respectively).

Conclusion: Open wound and high-velocity initial injuries as well as injury location were associated with the need for a secondary surgery following nonunion repair. Surgeons should be aware that the nature of the initial injury is a predictor of the need for an unplanned reoperation after fracture nonunion surgery as opposed to demographics or medical comorbidities. Appropriate care of these patients should be aimed at adjusting expectations of reoperation in the future.