Predicting Unplanned Return to the Operating Room After Fixation of Tibial Pilon Fractures

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Purpose: Open reduction and internal fixation (ORIF) of tibial pilon fractures has historically been associated with some of the highest complication rates and poorest functional outcomes of any extremity fracture. Despite the advent of staged protocols and less invasive approaches, there remains concern that the rate of wound complications and unplanned return to the operating room may still be high. The goal of this study was to investigate the rate and risk factors for unplanned secondary procedures in pilon fractures treated with ORIF.

Methods: All patients diagnosed with a pilon fracture (AO/OTA 43B or 43C) from 2007 to 2016 who underwent ORIF were retrospectively screened for inclusion. Unplanned return to the operating room was defined as a surgery at any time point after definitive ORIF and included irrigation and debridement for deep surgical site infection (SSI), hardware removal, nonunion or malunion revision, arthrodesis, and amputation. Multiple patient, injury, and treatment characteristics hypothesized to contribute to the outcome were evaluated and multivariate regression analysis was performed. 522 pilon fractures in 508 patients were included, with an average follow-up of 14 months. 27% of the fractures (n = 139) were open.

Results: The overall rate of return to the operating room was 167/522 (32%). 19.5% underwent symptomatic hardware removal, 13.8% required irrigation and debridement for deep SSI, 8.2% had nonunion or malunion revision, 4.0% underwent arthrodesis, and 1.3% had an amputation. The rate of return to the operating room for deep SSI in open fractures was 24% versus 10% in closed fractures (P <0.001). Severity of open fracture (Gustilo Type III, odds ratio [OR] 4.1, P <0.001) and severity of injury (43C fractures, OR 2.2, P = 0.02) were significantly associated with return to the operating room for deep SSI. Additionally, 2 other factors were close enough to significance to merit inclusion in the model for deep SSI: smoking (OR 1.6, P = 0.1) and mental illness (OR 2.1, P = 0.07). Age, associated injuries, work and payor status, American Society of Anesthesiologists (ASA) score, and fibular fixation had no significant effect on return to the operating room.

Conclusion: Unplanned return to the operating room after ORIF of a tibial pilon fracture remains prevalent, even for surgeons who commonly treat these complex injuries using modern techniques. Treatment plans should take into account the elevated risk of infection with complete articular involvement or severe open wounds.

See the meeting app for complete listing of authors’ disclosure information.