Does Surgical Approach Influence the Risk of Postoperative Infection Following Surgical Treatment of Tibial Pilon Fractures?

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Purpose: There are a number of surgical approaches to tibial pilon fractures. There is no study that compares the various approaches to pilon fractures as it relates to the risk of postoperative infection. The purpose of this study is to determine whether a particular surgical approach or combination of approaches is a risk factor for infection after open reduction and internal fixation (ORIF) of pilon fractures.

Methods: This is a retrospective review of pilon fractures managed at 2 Level I trauma centers between 2001 and 2015. Data regarding medical comorbidities, closed versus open fracture, use of initial temporizing external fixation, timing of ORIF, and surgical approach were recorded. Fractures were classified according to the AO/OTA system. Multiple logistic regression analysis was used to identify independent risk factors for postoperative infection.

Results: A total of 590 fractures in 581 patients (384 males, 197 females) with a median age of 45 years (interquartile range [IQR], 35-55 years) were reviewed. Open fractures occurred in 24% of the cases. Initial temporizing external fixation was applied to 54% of the fractures. Median time between injury and ORIF was 8 days (IQR, 1-16 days). The most common primary surgical approach used was medial (54%), followed by anterolateral (25%), anterior (11%), posterolateral (8%) and posteromedial (2%). A dual approach to the distal tibia was used in 18% of cases. Fibular fixation was used in 43% of the cases. The deep infection rate was 19%. Univariate regression analysis demonstrated an unadjusted association between infection and several variables: male sex (P = 0.003), smoking (P = 0.003), open fracture (P = 0.004), initial temporizing external fixation (P = 0.001), and AO/OTA 43-C fractures (P = 0.007). Independent risk factors for infection according to multiple logistic regression analysis were: (1) male sex (odds ratio [OR] = 1.9, 95% confidence interval [CI] = 1.2-3.2, P = 0.012), (2) smoking (OR = 2.0, 95% CI = 1.3-3.1, P = 0.003), and (3) AO/OTA 43-C fractures (OR = 1.9, 95% CI = 1.1-3.5, P = 0.03).

Conclusion: Surgical approach does not appear to be a significant risk factor for postoperative infection following ORIF of distal tibial pilon fractures. Independent risk factors for postoperative infection include male sex, smoking, and higher-energy fractures. When treating pilon fractures, surgeons should select the approach they feel best addresses the specific fracture pattern.