

**Definitive Fixation of Open Tibia Fractures: Perform Through Traumatic Wound or New Incisions?**

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**Purpose:** This study examined rates of infection and nonunion in patients with open tibia fractures undergoing staged definitive fixation through a new surgical incision versus reopening of the traumatic wound. It was hypothesized that instrumentation through the traumatic wound would increase risk of infection and nonunion.

**Methods:** A retrospective review identified patients with open tibia fractures from 2013-2018 at a large academic Level-I trauma center. Primary outcome measures were incidence of infection and nonunion. Also collected were demographic information, smoking status, diagnosis of diabetes, AO/OTA classification, type and location of open fracture, type of fixation, need for flap coverage, revision surgeries and timing of antibiotics, initial debridement, traumatic wound closure, and definitive fixation.

**Results:** Results are summarized in Table 1. In a groupwise comparison no differences were found between groups for demographics or known risk factors for infection and nonunion (list of collected variables in Methods section). No statistically significant differences for infection or nonunion were found between Groups 2 and 3. Multiple logistic regression also indicated no difference in rates of infection or nonunion when controlling for known risk factors. In a multiple logistic regression model an AO/OTA classification of 43C was independently predictive of infection for all open tibia fractures regardless of study group designation ( $P < 0.05$ ). No other risk factors were statistically significant predictors of infection or nonunion.

**Conclusion:** For open tibia fractures that underwent staged fixation, no statistically significant differences in infection or nonunion were observed between those performed by reopening the traumatic wound versus through new incisions. Results did not support the hypothesis that reopening a traumatic wound for definitive fixation increases risks of complications. An AO/OTA classification of 43C was found to be an independent predictor of infection for all patients undergoing staged fixation.