

## Debridement of Open Tibia Fractures More Than 48 Hours After Injury: Does Time to Surgery Matter?

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**Background/Purpose:** Surgical debridement is a critical step in the successful treatment of open tibia fractures. Although most surgeons aim for debridement within 6 to 24 hours, the optimal time to debridement is not known. Recent reports have suggested other factors such as Gustilo-Anderson type, prompt initiation of antibiotics, and time to definitive closure are more predictive of infection than time to surgery. We sought to determine the effect of a prolonged delay to surgical debridement for open tibia fractures. Our hypothesis is that time to surgery for open tibia fractures does not affect the infection or reoperation rates for open tibia fractures.

**Methods:** All patients treated for an open diaphyseal tibia fracture (OTA / AO 42) at a Level I trauma center between 2011 and 2015 were identified using CPT codes. Patients were excluded for age <18, less than 12 weeks of follow-up, or a history of prior surgery to the injured tibia. Patient factors such as age, gender, mechanism of injury, laterality, tobacco and drug use, medications (ie, NSAIDs [nonsteroidal anti-inflammatory drugs], steroids, anticonvulsants, etc), and comorbidities were recorded. The open fracture classifications of Gustilo-Anderson and the OTA were also applied. Patients were divided into 3 groups based on time to surgery: group A <24 hours, group B 24-48 hours, and group C >48 hours. Patient charts were reviewed for deep infection and unplanned reoperation for any cause. A Fisher's exact test was used to determine statistical significance between infection and reoperation rates among the various groups.

**Results:** We initially identified 149 patients, with 97 available for analysis after exclusion criteria were applied. The average follow-up was 56 weeks (range, 13 weeks-4 years, 6 months). There were 47 patients in group A, 28 in group B, and 22 in group C. Infection rates for groups A, B, and C were 12.8%, 10.7%, and 9.1%, respectively ( $P = 0.959$ ). Reoperation rates for groups A, B, and C were 29.8%, 21.4%, and 27.3%, respectively ( $P = 0.779$ ). In terms of Gustilo-Anderson classification, there were 19 type I, 46 type II, 8 type IIIA, 22 type IIIB, and 2 type IIIC with infection rates of 10.5%, 6.5%, 37.5%, 13.6%, and 0% ( $P < 0.158$ ); and reoperation rates of 10.5%, 19.6%, 37.5%, 45.5%, and 100%, respectively ( $P < 0.008$ ). The groups did not vary in proportion of Gustilo-Anderson fracture types. No other factors assessed were predictive of infection or reoperation rates.

**Conclusion:** A delay of more than 48 hours to surgical debridement of open tibia fractures did not result in a greater infection or reoperation rates. The Gustilo-Anderson classification was more predictive of reoperation with Type IIIA, B, and C injuries having a statistically significant higher reoperation rate than the other types.