

## **How Successful Is Antibiotic Treatment for Superficial Surgical Site Infections Following Open Fracture? A FLOW Trial Cohort Secondary Analysis**

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**Purpose:** Many studies report the incidence and prevalence of surgical site infections (SSIs) following open fractures; however, there is limited information on the treatment and subsequent outcomes of superficial SSIs in open fracture patients. There is also a lack of clinical studies describing the prognostic factors that are associated with failure of antibiotic treatment (nonoperative) for superficial SSI. To address this gap, we used data from the FLOW (Fluid Lavage of Open Wounds) trial to determine how successful antibiotic treatment was for superficial SSIs and to identify prognostic factors that could be predictive of antibiotic treatment failure.

**Methods:** This is a secondary analysis of the FLOW trial dataset. The FLOW trial included 2445 operatively managed open fracture patients. FLOW participants who had a nonoperatively managed superficial SSI diagnosed in the 12 months post-fracture were included in this analysis. Participants were grouped into 2 categories: (1) participants whose superficial SSI resolved with antibiotics alone and (2) participants whose SSI did not resolve with antibiotics alone (defined as requiring surgical management or SSI being unresolved at final follow-up [12 months post-fracture for the FLOW trial]). A logistic binary regression analysis was conducted to identify factors associated with superficial SSI antibiotic success. Based on biologic rationale and previous literature, a priori we identified 13 potential factors (corresponding to 14 levels) to be included in the regression model.

**Results:** Superficial SSIs were diagnosed in 168 participants within 12 months of their fracture. Of these, 139 (82.7%) had their superficial SSI treated with antibiotics alone. The antibiotic treatment was successful in resolving the superficial SSI in 97 participants (69.8%) and unsuccessful in resolving the SSI in 42 participants (30.2%). We found that superficial SSIs that were diagnosed later in follow-up were associated with failure of treatment with antibiotic alone (odds ratio 1.05 for every week in diagnosis delay, 95% confidence interval 1.004-1.099;  $P = 0.03$ ). Age, sex, fracture severity, fracture pattern, wound size, and time from injury to initial surgical irrigation and debridement were not associated with antibiotic treatment failure.

**Conclusion:** Our secondary analysis of prospectively collected FLOW trial data found antibiotics alone resolved superficial SSIs in 69.8% of patients diagnosed with superficial SSIs. We also found that superficial SSIs that were diagnosed earlier in follow-up were associated with successful treatment with antibiotics alone. This suggests that if superficial SSIs are diagnosed and treated promptly, there is a higher probability that they will resolve with antibiotic treatment.