

## **The Impact of Smoking on Hospital Course and Postoperative Outcomes in Patients with Fracture-Related Infections**

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### **INTRODUCTION:**

Smoking negatively impacts bone metabolism which may lead to increased risk of fracture, fracture nonunion, and postoperative infection. While previous studies have investigated the impact of smoking on the incidence of fracture-related infection (FRI), there is a paucity of literature comparing the patient presentation, hospital course characteristics, or postoperative outcomes of smoking versus non-smoking patients with FRI. We sought to understand how smoking status impacts patient presentation, treatment course, and fracture resolution in patients with FRI.

**METHODS:** We performed a single-institution retrospective analysis of all patients undergoing reoperation for FRI from January 2013 to April 2021. Data including patient demographics, original fracture characteristics, infection presentation, hospital course characteristics, and post-infection outcomes were collected via review of the electronic medical record. Patients were grouped based on current smoker versus non-smoker status and their hospital course and postoperative outcomes were compared.

### **RESULTS:**

A total of 301 patients undergoing reoperation for FRI, comprised of 155 (51.5%) current smokers and 146 (48.5%) non-smokers, were included. Compared to non-smokers, current smokers were younger at time of fracture-related reoperation (41.6 years vs. 49.9 years;  $p = 0.001$ ), had lower mean body mass index (27.5 vs. 32.3;  $p = 0.001$ ), had lower mean Charlson Comorbidity Index (0.99 vs. 1.92;  $p = 0.001$ ), and were more likely male (69.0% vs. 56.2%;  $p = 0.021$ ). Compared to non-smokers, current smokers had higher rates of fistulas or sinus tracts at the fracture site (38.6% vs. 22.8%;  $p = 0.003$ ), a higher proportion of methicillin-resistant *Staph aureus* (MRSA) infections (29.7% vs. 18.5%;  $p = 0.024$ ), and a lower proportion of *Staph epidermidis* infections (11.0% vs. 19.9%;  $p = 0.032$ ) on presentation. There were no significant differences in union rates, amputation rates, systemic complications, or total number of operations between groups. Using binary logistic regression, smoking remained an independent risk factor for MRSA infection (OR 1.99;  $p = 0.024$ ) and development of fistula or sinus tract at the fracture site (OR 2.24;  $p = 0.005$ ).

### **DISCUSSION AND CONCLUSION:**

Among patients who develop FRI, current smoking status is associated with a higher proportion of MRSA infections and higher incidence of fistulas or sinus tracts at the fracture site at the time of reoperation.