Risk Factors for Surgical Site Infection after Distal Humerus Fracture Fixation

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INTRODUCTION: The purpose of this study is to evaluate and identify factors associated with superficial or deep surgical site infections (SSIs) after distal humerus fracture fixation.

METHODS: All distal humerus fractures treated surgically at a single level 1 trauma center from November 2014 to September 2021 were retrospectively reviewed. A minimum three-month follow up was required for inclusion. Patients with skeletal immaturity were excluded. SSI consisted of superficial infection (defined as an infection resolving with oral antibiotics) and/or deep infection (defined as positive cultures at the time of secondary debridement). Patient demographics and injury and operative characteristics were compared between those who developed SSI and those who did not.

RESULTS: One-hundred-forty-six patients with distal humerus fractures (33 OTA 13A, 18 OTA 13B, and 95 OTA 13C) were included in the study, with 18 patients (12.3%) developing SSI after fixation. Average follow up was 256 days. Compared to controls, patients who developed SSI were significantly older (58.1 vs. 48.3 years, P=0.049), had more debridements prior to fixation (1.4 vs. 0.5, P=0.004), and had higher rates of OTA 13C fractures (94.4% vs. 60.9%, P=0.019), external fixation application (16.7% vs. 4.7%, P=0.048), and soft tissue coverage (11.1% vs. 1.6%, P=0.020). Those with SSI had a higher rate of open fractures (55.6% vs. 34.4%), but this did not reach statistical significance (P=0.081). There were no significant differences in body mass index, smoking status, injury mechanism, Gustilo-Anderson classification, days from admission to definitive fixation, operative time, as well as rates of diabetes, intravenous drug use, neurovascular injury, or olecranon osteotomy between the two groups.

DISCUSSION AND CONCLUSION: The present study showed that 12.3% of patients developed SSI after distal humerus fracture fixation. Older age, OTA 13C fractures, soft tissue coverage, and a higher number of debridements prior to fixation were associated with the development of SSI. The use of external fixation for staged management is associated with higher rates of infection and surgeons should consider debridement and splinting if staged management is warranted. This information can be useful in guiding surgeons' treatment of these difficult fractures.