Risk Factors Associated with Surgical Site Infection in Ankle Fracture Dislocations (AFDs)

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INTRODUCTION:

Ankle fracture-dislocations (AFD) are violent injuries with reported worse prognosis compared to their non-dislocated counterparts. There is limited literature describing the demographic characteristics and risk factors for complications due to these injuries. This study sought to analyze risk factors for surgical site infection (SSI) in AFDs.

METHODS:

Ankle fractures from 2013 to 2023 at a single Level I trauma center were reviewed. Patients with complete tibiotalar dislocation defined by absolute articular incongruity in either the lateral or anteroposterior radiographic views were included. Patients with pan-talar dislocations and those who were already successfully reduced or operatively managed at outside institutions were excluded. Successful reduction was defined as near anatomic articular alignment as measured by less than 3 mm of coronal plane displacement and less than 5 mm of sagittal plane displacement on post reduction radiographs. Demographic characteristics were recorded. Primary outcomes assessed were superficial and deep SSI. Bivariate analysis was performed using Wilcoxon non-parametric tests, Chi-Square tests, and Fisher's Exact tests. Significance was indicated by p<0.05.

RESULTS:

In total, 238 AFDs met inclusion criteria. The mean age was 51.4 years old, with 65.1% (n=155) being female. The mean BMI was 34.83. 11 were 44C, 155 were 44B, and 76 were 44C AO/OTA fractures. When classified using the Lauge-Hansen system, 64.7% (n=154) were supination external rotation, 4.6% (n= 11) were supination adduction, 18.9% (n=45) were pronation abduction, 8.8% (n= 21) were pronation external rotation, and 2.9% (n= 7) were unclassifiable. Of the 238 AFDs, 34.0% (n=81) were open fractures. 18.1% (n=43) had superficial or deep SSI and 11.8% (n=28) had deep SSI. 56.3% of injuries had syndesmotic injury that required operative fixation.

Demographic characteristics significantly associated with incidence of either superficial or deep SSI included neuropathy, peripheral vascular disease (PVD), chronic kidney disease (CKD), American Society of Anesthesiologists (ASA) score, and open fractures (p<0.01, p<0.04, p<0.04, p<0.5, p<0.01, respectively). Injury characteristics significantly associated with incidence of either superficial or deep SSI included anterior direction of dislocation, posterior direction of dislocation, and increased injury severity score (p<0.01, p<0.01, p<0.03, respectively).

Demographic characteristics significantly associated with incidence of deep SSI included neuropathy, PVD, CKD, open fractures, and Type III Gustilo Anderson (GA) classification (p<0.01, p<0.02, p<0.02, p<0.01, p<0.01, p<0.01, respectively). Injury characteristics significantly associated with incidence of deep SSI included anterior direction of dislocation, and posterior direction of dislocation (p<0.01, p<0.01, p

DISCUSSION AND CONCLUSION:

The overall deep SSI prevalence in our cohort was 11.8%. Neuropathy, peripheral vascular disease, chronic kidney disease, open fractures, Type III GA, anterior and posterior direction of dislocation were significantly associated with an increased incidence of deep SSI. Interestingly, successful anatomic reduction and coronal and sagittal plane displacement was not associated with incidence of SSI. This data may allow surgeons to better understand prognosis of AFDs prior to surgical fixation.