Time to Diagnosis and Treatment of Superficial versus Deep Incisional Surgical Site Infections in Foot and Ankle Surgery

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Introduction/Purpose: Surgical site infections (SSI) are among the most expensive healthcare-associated infections and result in a substantial psychosocial and financial burden for both patients and the healthcare system. A majority of SSIs are estimated to be preventable. Previous literature has focused on antibiotic prophylaxis as the primary intervention to reduce the incidence of SSI. However, little work in the foot and ankle literature has been done on the characterization and risk stratification of patients who will go on to develop superficial versus deep incisional SSIs. Moreover, the time at which patients typically present with an SSI has not been characterized. The primary aim of this study was to quantify the time from surgical intervention to the onset of superficial versus deep SSI.

Methods: A retrospective review of 1933 foot and ankle procedures in 1632 patients from January 1, 2011 through August 31, 2015 was performed. Demographic data, type of surgery, subsequent diagnosis of superficial or deep incisional SSI, as well as amount and timing of antibiotic administration, incision, tourniquet and closure time were recorded. Superficial incisional SSIs were defined as those successfully treated with antibiotic therapy alone. Deep incisional SSIs were defined as those requiring subsequent wound irrigation and debridement (I&D). Time to treatment, outcomes and demographic variables were compared between patients that were treated with antibiotics alone and those that required I&D for definitive management.

Results: 1569 procedures with complete data met inclusion criteria. There were 17 deep incisional SSIs (1.1%) that required I&D as part of definitive management. There were 63 superficial incisional SSIs (4.0%) that were treated successfully with antibiotics alone. The time interval between surgery and the initial treatment of deep incisional SSI (range: 11 to 42 days) was significantly greater than the time interval between surgery and initial treatment of superficial incisional SSI (range: 4 to 38 days) (28.18 ± 9.11 vs. 13.40 ± 4.65 days, p=<0.001). A total of 11 of 17 (64.7%) infections ultimately diagnosed as deep incisional SSIs failed a trial of antibiotics prior to I&D, in the remaining 6 of 17 (35.3%) infections antibiotics were held until intra-operative wound cultures were obtained.

Conclusion: In our cohort of patients undergoing foot and ankle surgery the time to initial diagnosis and treatment of deep incisional SSI was longer than the time to diagnosis and treatment of superficial incisional SSI. Moreover, deep infections did not present until four weeks after surgery on average; this data is of some benefit in trying to define and understand SSIs.

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