

Predictors of Postoperative Outcomes in Chronic Long Bone Osteomyelitis Patients

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INTRODUCTION:

Long bone osteomyelitis has been described as a complex disease that is associated with high complications. It may result from either hematogenous or contiguous spread of infection. Treatments include antibiotic therapy and potential surgical management. However, no study has investigated the rates and specific risk factors for complications following surgery for chronic long bone osteomyelitis. The purpose of this study was to assess the rate and potential risk factors for postoperative complications in chronic long bone osteomyelitis patients.

METHODS:

The American College of Surgeons (ACS) National Surgical Quality Improvement Program (NSQIP) database was queried with relevant ICD-9 and ICD-10 codes to identify all patients who underwent surgery in 2008-2016 for chronic osteomyelitis of the humerus, radius/ulna, femur, or tibia/fibula. The identified pool of patients was further refined by selecting for patients who had debridement, excision, incision, and sequestromy procedures using current procedural terminology (CPT) codes. Postoperative outcomes including complications, readmissions, reoperations, and extended length of stay were investigated (≥ 75 th percentile length of the stay). Binary logistic regression analysis controlling for the modified Charlson Comorbidity Index (mCCI) was used to identify risk factors for adverse postoperative outcomes.

RESULTS:

A total of 318 patients were identified. Mean age was 50.58, male 70.8%, white 63.8%. There were 64 (20.1%) patients who had postoperative complications, 11 (3.5%) required reoperations, and 23 (7.2%) were readmitted. Of the patients, 179 (56.3%) had tibia/fibula osteomyelitis, 95 (29.9%) had femur osteomyelitis, 28 (8.8%) had humerus osteomyelitis, and 16 (5.0%) had radius/ulna osteomyelitis. Within 30-days postoperatively, the most common major complications were deep surgical site infection (16 patients, 25%) and sepsis (13 patients, 20.3%). Univariate analysis showed history of diabetes, open wound, and hypoalbuminemia to be risk factors significant for complications (all $p < 0.02$). After controlling for mCCI, binary logistic regression analysis revealed diabetes (OR=2.7 [1.1-6.6], $p=0.027$), open wound (OR=2.0 [1.2-3.6], $p=0.015$), and hypoalbuminemia (OR=1.9 [1.1-3.6], $p=0.032$), to be significant risk factors for complications. Hypoalbuminemia was also found to be a risk factor significant for reoperation (OR=4.0 [1.2-13.5], $p=0.027$), readmission (OR=2.6 [1.1-6.3], $p=0.032$) and extended length of stay (OR=3.1 [1.8-5.5], $p < 0.001$), but not mortality ($p=0.052$). Additionally, patients with open wound(s) (6.6 days vs 10.1 days; $p=0.004$) had significantly longer lengths of stay.

DISCUSSION AND CONCLUSION:

Surgical management of chronic long bone osteomyelitis remains difficult, with 20.1% of patients experiencing postoperative complications. History of diabetes, open wound, and hypoalbuminemia were identified as risk factors for postoperative complications, with hypoalbuminemia also being a significant risk factor for extended length of stay, reoperation, and readmission. This builds on prior investigations that suggest hypoalbuminemia as an independent predictor for postoperative complications.