Risk Factors for Early Reoperation Following Operative Treatment of Acetabular Fractures

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Purpose: Despite the widespread use of open reduction and internal fixation (ORIF) to treat displaced acetabular fractures, there are limited data on the risk factors that drive early treatment failure and return to the operating room. The purpose of this study is to evaluate the rates and risk factors for early reoperation following operative fixation of acetabular fractures.

Methods: This retrospective case-control study evaluated early reoperation following acetabular ORIF. All patients admitted with a displaced acetabular fracture from 2006-2015 who underwent acetabular ORIF were screened for inclusion. 806 patients met inclusion and exclusion criteria. Early reoperation was defined as a secondary procedure within 3 years of the initial operative treatment, including irrigation and debridement for infection, conversion to total hip arthroplasty (THA), revision ORIF, and implant removal. We evaluated risk factors hypothesized to be associated with early reoperation including patient demographics, comorbidities, fracture patterns, associated injuries ,and descriptors of surgical treatment. Bivariate statistical analysis, comparing patients who underwent early reoperation against those who did not, identified significant variables associated with reoperation, which were then evaluated in a multivariate regression analysis. Significance was set at a P value <0.05.

Results: Of the 806 included patients, 14% (n = 105) underwent early reoperation. 59 (7.3%) underwent irrigation and debridement for infection and wound complications. Risk factors associated with infection and wound complications included pelvic embolization (odds ratio [OR] 5.53, 95% confidence interval 2.04-15.0), body mass index (BMI) (OR 1.04, 1.01-1.08), and time between injury and surgical fixation (OR 1.12, 1.06-1.18). For BMI, a 10-point increase results in a 50% increase in infection rate. For time, a 1-day surgical delay leads to a 12% increase in infection rate. 57 (7.1%) underwent early reoperation for failure, including 39 conversions to THA, 8 revision ORIF, and 9 hardware removals. Risk factors associated with early failure and reoperation included hip dislocation (OR 3.71, 1.95-7.05), ipsilateral injury to the femoral head or neck (OR 2.44, 1.26-4.71), age (OR 1.02, 1.01-1.04), and articular comminution (OR 2.12, 1.15-3.91). For age, odds of failure increase by 30% for every 10 years. Interestingly, combined injuries to the pelvic ring and acetabulum, marginal impaction, and BMI had no significant effect on early failure.

Conclusion: The main drivers of early reoperation and treatment failure following acetabular ORIF differed based on the reason for the return to the operating room. Cases of infection

See pages 49 - 106 for financial disclosure information.

were more likely in patients who were embolized, were obese, or had delay in time to fixation (likely indicating more severe overall injury burden preventing earlier operative treatment). Return to the operating room for arthroplasty or fixation failure was more likely with hip dislocation, femoral head or neck fracture, advancing age, and articular comminution ($P < 0.05$). These factors may be useful for patients and clinicians as they evaluate the risks and benefits of operative treatment of acetabular fractures.