Predictors of Unplanned Reoperation after Operative Treatment of Pelvic Ring Injuries

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Purpose: Pelvic ring injuries are associated with relatively high rates of mortality and morbidity, but little is known regarding the risk factors for complication and unplanned reoperation. The goal of this study is to evaluate the incidence of unplanned reoperation after pelvic ring injuries and to develop a risk prediction model. Our hypothesis is that unplanned reoperation will be relatively common, occurring early, and that strong predictors for reoperation will be identified.

Methods: We reviewed the medical records of 913 patients with operatively treated pelvic ring injuries at our Level I trauma center from 2003 to 2015. The primary outcome measure was unplanned index reoperation for the following indications: infection, fixation failure, heterotopic ossification (HO), or bleeding complication. Multiple logistic regression analysis was performed to evaluate for the relative contribution of associated clinical parameters to unplanned reoperation. A risk prediction model was then developed using logistic regression analyses, which enabled us to assess the effect of multiple covariates. The mean age was 35 ± 13 years (range, 14-89). There were 644 males, 269 females. The inhospital mortality rate was 4.1% (n = 37). Combined pelvic ring and acetabulum injuries were relatively common (17.6%, n = 161), 8.0 % (n = 73) were open injuries, 27.3% (n = 249) sustained head injuries, 19.9% (n = 154) had urogenital injuries, and 31% (n = 283) had abdominal viscera injuries.

Results: The overall rate of unplanned reoperation was 14.6% for the following indications: infection (8.1%, n = 74), fixation failure (5.7%, n = 52), HO (<1%, n = 6), and bleeding complication (<1%, n = 1). Reoperation for infection and failure typically occurred within the first month of the index procedure (mean occurrence of 19 and 22 days, respectively). We identified four independent predictors of reoperation: open fractures (odds ratio [OR] 2.74, P = 0.001), combined pelvic ring and acetabular injuries (OR 2.46, P <0.001), abdominal viscera injuries (OR 2.56, P <0.001), and increasing Young-Burgess pelvic fracture grade (AP compression [APC] II/lateral compression [LC] II OR 3.31, P = 0.013; APC III/LC III fractures OR 6.90, P <0.001; and vertical shear [VS]/combined mechanism injury [CMI]/sacral fractures OR 8.69, P <0.001). There was no independent association between reoperation and patient, treatment or any other injury factors that were evaluated (P >0.20).

See pages 49 - 106 for financial disclosure information.

Conclusion: As we hypothesized, unplanned reoperation was relatively common (15%) in this large series of operatively treated pelvic fractures. Infection and fixation failure were the most common indication for unplanned reoperation. We did identify factors that were associated with reoperation. These factors are related to the severity of the injury to the local pelvis and abdominal viscera (open fracture, Young-Burgess fracture class, combined pelvic and acetabular fractures, and abdominal viscera injury). These data should be useful for clinicians in discussing the risks of surgery with patients as well as helping them to direct their efforts to reduce the reoperation rate.