Prevention of Heterotopic Ossification May Enhance Functional Outcomes Following Fixation of Acetabular Fractures

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Purpose: Prior studies have emphasized quality of reduction to maximize clinical and radiographic outcomes following fixation of acetabulum fractures. Recent large series of patient-reported outcomes are limited, and other potentially modifiable risk factors may be unidentified. The goal of this study was to describe patient and injury factors that negatively influence functional outcomes following operative management of acetabular fractures.

Methods: Between 1999 and 2016, 686 patients with acetabular fractures were treated with open reduction and internal fixation. Of these, 283 (41%) completed the Musculoskeletal Function Assessment (MFA) more than 1 year after injury. MFA scores range from 1 to 100 and higher scores represent greater dysfunction. Factors were assessed for potential association with MFA scores, and univariate and multiple linear regression analyses were performed.

Results: Responders to the survey did not differ from the initial group in terms of demographics; however, non-responders were less severely injured than responders (ISS 15.9 vs 19.0, $P < 0.001$). Mean age of responders was 44 years, and most were male (69%). 95% had high-energy injuries, with 65% resulting from motor vehicle collision. Posterior wall (23%) and transverse with posterior wall (21%) patterns were most common. Comorbid conditions occurred frequently, including obesity (51.2%), diabetes mellitus (14%), mental illness (21%), and tobacco smoking (31%). Posttraumatic arthritis and heterotopic ossification occurred frequently (25% and 22%, respectively). Multiple linear regression to identify factors associated with worse MFA yielded a significant model (adjusted $R2 = 0.21$, $P < 0.001$). Tobacco use ($\beta = 15.3$, $P < 0.001$), higher body mass index (BMI) ($\beta = 0.45$, $P = 0.007$), the presence of diabetes ($\beta = 7.57$, $P = 0.03$), posttraumatic arthritis ($\beta = 6.75$, $P = 0.023$), and heterotopic ossification ($\beta = 7.89$, $P = 0.009$) were independently associated with worse MFA scores.

Conclusion: In the largest series to date of patient-reported functional outcomes following fixation of acetabular fractures, tobacco use, obesity, comorbid diabetes, posttraumatic arthritis, and heterotopic ossification were associated with worse MFA scores. Of these, arthritis and heterotopic ossification representpotentially modifiable risk factors. In addition to emphasis on reduction quality, intraoperative and postoperative techniques to reduce the risk of heterotopic ossification may enhance functional outcomes.