

## Risk Factors for Poor Functional Outcomes Following Acetabular Fracture

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**Purpose:** Acetabular fractures continue to present challenges to treating surgeons. Prior investigations have focused on radiographic assessment of outcomes of acetabular fractures. Currently, there is growing interest in evaluating functional outcomes following these injuries. The goal of this study was to identify potential injury, medical, and psychosocial factors associated with functional outcomes following fracture of the acetabulum.

**Methods:** During a 17-year period at a single Level-I trauma center, 353 skeletally mature patients with acetabular fractures (AO/OTA 62) completed the Musculoskeletal Function Assessment (MFA) surveys after minimum 1 year following injury (mean 66 months). Scores range from 1 to 100 with high scores indicating worse function. Univariate and multiple linear regression analyses were used to identify factors associated with MFA scores.

**Results:** On univariate analysis, females (38.3 vs 30.3,  $P = 0.003$ ), tobacco users (41.7 vs 28.8,  $P < 0.0001$ ), diabetics (42.1 vs 31.4,  $P = 0.004$ ), and patients with mental illness (42.1 vs 31.4,  $P = 0.047$ ) reported more disability. Mean ISS was 19.0; ISS positively correlated with MFA score ( $r = 0.11$ ,  $P = 0.031$ ). Fracture type was not correlated with MFA score ( $P = 0.20$ ). We were also unable to establish a correlation between length of follow-up after 1 year and MFA score ( $r = -0.018$ ,  $P = 0.8397$ ). However, MFA scores were worse in patients who developed osteonecrosis of the femoral head (6.2%) (40.5 vs 32.3,  $P = 0.04$ ), heterotopic ossification (HO) (18%) (40.5 vs 30.8,  $P = 0.0003$ ), and/or posttraumatic arthritis (21%) (PTA; 39.4 vs 31.0,  $P = 0.006$ ). Multiple linear regression modeling yielded a significant model (adjusted  $R^2 = 0.251$ ,  $P < 0.0001$ ) where tobacco use ( $\beta = 14.6$ ,  $P < 0.0001$ ), diabetes ( $\beta = 10.1$ ,  $P = 0.0013$ ), higher body mass index (BMI) ( $\beta = 0.61$ ,  $P < 0.0001$ ), development of PTA ( $\beta = 5.71$ ,  $P = 0.043$ ), and development of HO ( $\beta = 9.99$ ,  $P = 0.0003$ ) were independently associated with worse MFA scores. Subgroup analysis revealed that in patients aged 18-45 years, only tobacco use ( $\beta = 17.6$ ,  $P < 0.0001$ ) and higher BMI ( $\beta = 0.53$ ,  $P < 0.0001$ ) were independently associated with worse functional outcome scores. In patients 65 years and older, only development of PTA or worsening of prior hip arthritis ( $\beta = 14.5$ ,  $P < 0.03$ ) independently associated with worse functional outcome scores.

**Conclusion:** Many patients report substantial disability more than 1 year following acetabulum fracture. Underlying patient-related factors are outside of surgeon control and may relate to baseline functional limitations. Posttraumatic arthritis was independently associated with poor outcomes, especially in older patients. There were clear relationships between demographic, medical, and radiographic risk factors and poor functional outcomes. This information is critical in guiding treatment and in setting expectations with patients.