

## **Predictors of Early Posttraumatic Arthritis Secondary to Open Reduction and Internal Fixation of the Acetabulum**

*Robert Matar MD; Tyler Ames MD; Shayan A Farahani MS; Michael T Archdeacon MD; Theodore Toan Le MD*

University of Cincinnati, Cincinnati, OH, United States

**Purpose:** The purpose of this study was to identify patient-specific and injury-related risk factors that predict the development of early posttraumatic arthritis after operative treatment of acetabular fractures.

**Methods:** A retrospective chart review was performed on all patients with operatively treated acetabular fractures at a university Level-I trauma center between May 13, 2011 and August 30, 2019 that subsequently underwent conversion to a total hip arthroplasty (THA) within 1.5 years. Data were collected on patient demographics, mechanism of injury, fracture classification, and time to surgery. Radiographic data were assessed for the presence of initial dislocation, marginal impaction, posterior wall comminution, acetabular protrusion, and lateral plate position. Patients were classified as having early posttraumatic arthritis if they developed radiographic and clinical evidence of arthritis by 6 months after their primary open reduction and internal fixation (ORIF) of the acetabulum. Statistical analysis was performed with a P value <0.05 being considered statistically significant.

**Results:** 985 patients underwent operative fixation of the acetabulum. Among these patients, 56 were converted to a THA, of which 32 were converted within 1.5 years of their primary ORIF of the acetabulum. The average age of the cohort was  $51.9 \pm 14.9$  years (range, 17.0-81.0). 21 of 28 patients (75.0%) developed early posttraumatic arthritis (<6 months), 7/28 (25.0%) developed posttraumatic arthritis at greater than 6 months, and 4 patients underwent THA for loss of fixation. The presence of dislocation and marginal impaction were both significantly associated with development of early posttraumatic arthritis (P = 0.05 and 0.03, respectively). Posterior wall comminution, lateral plate placement, and acetabular protrusion did not independently predict early posttraumatic arthritis. Furthermore, age, gender, mechanism of injury, fracture classification, and time to surgery were not associated with the development of early posttraumatic arthritis.

**Conclusion:** The presence of dislocation or marginal impaction on preoperative imaging of acetabular fractures had a significant ability to predict early posttraumatic hip arthritis. The treating surgeon can use this information in preoperative patient counseling and may consider performing a primary THA along with ORIF as the initial treatment for selected patients with these risk factors.