

## **Transverse Posterior Wall Fractures Are at High Risk for Conversion Total Hip Arthroplasty After Acetabular Fracture Fixation**

*Kyle Cichos BS; Elie S Ghanem MD; Jonathan H Quade MD; Gerald McGwin PhD; Clay A Spitler MD*  
University of Alabama at Birmingham, Birmingham, AL, United States

**Purpose:** The purpose of this study is to determine risk factors for conversion total hip arthroplasty (THA) after operative treatment of acetabular fractures and to examine risk factors for conversion THA specific for transverse posterior wall acetabular fractures.

**Methods:** 685 patients undergoing operative fixation of acetabular fractures at our Level-I trauma center treated from 2011 to 2017 were identified. The average follow-up was 16 months (range, 1-102 months). Patient demographics, comorbidities, operative, and in-hospital variables were compared between patients undergoing conversion THA and those not converted. Logistic regression was used to identify independent risk factors for conversion THA by estimating odds ratios (ORs) and 95% confidence intervals (CIs). Subanalysis on patients with transverse posterior wall fractures was performed using similar statistical analyses. Sensitivity analyses were performed limiting analyses to include only patients with minimum follow-up set at 3 different times: 3 months, 6 months, and 1 year.

**Results:** 108 patients (15.8%) underwent conversion THA, with 52% of conversions occurring within 1 year, 79% within 2 years, and the remaining 21% within 6 years of the index acetabular open reduction and internal fixation (ORIF). The average time to conversion THA was 18 months (range, 0.5-66). The risk of conversion THA by fracture pattern was: 53/196 (27%) transverse posterior wall, 12/52 (23%) T-shaped, 10/68 (15%) posterior column with posterior wall, and 25/207 (12%) posterior wall. Independent risk factors for conversion were: transverse posterior wall fracture (OR 1.98; 95% CI 1.03-3.81; P = 0.001), protrusio (OR 4.92; 95% CI 1.77-13.66; P = 0.002), hip dislocation (OR 4.02; 95% CI 1.69-9.61; P = 0.002), increased body mass index (BMI) (OR 1.04; 95% CI 1.00-1.07; P = 0.036), increased age (OR 1.06; 95% CI 1.04-1.08; P <0.0001), infection (OR 2.90; 95% CI 1.24-6.77; P = 0.014), and dislocation (OR 21.14; 95% CI 4.26-104.99; P = 0.0002) after ORIF. Subanalysis (preoperative variables only) on patients with transverse posterior wall fractures resulted in only increased age (OR 1.06; 95% CI 1.03-1.09; P <0.0001) and BMI (OR 1.06; 95% CI 1.01-1.11; P = 0.014) as risk factors for conversion THA in this cohort. Patients with transverse posterior wall fracture who are >35 years old, have a BMI >30 kg/m<sup>2</sup> and 1 or more of dislocation, retained intra-articular fragments, wall comminution, or femoral head injury had a 50% risk of conversion THA within 5 years. Sensitivity analyses showed no difference in outcomes with any of the 3 chosen minimum follow-up durations.

**Conclusion:** Transverse posterior wall fractures have a high risk of conversion THA compared to other acetabular fracture patterns. Consideration for different management options warrants further study in the subset of patients with transverse posterior wall acetabular fractures.