

Early Conversion to Total Hip Arthroplasty following Acetabular Fracture Fixation is Associated with Greater Intraoperative Blood Loss, Longer Lengths of Stay, and Increased Rates of Postoperative Complications

Phillip Grisdela, Devon Tracey Brameier, Jenny Oh, Jessica L Duggan, Jose I. Acosta, Stephen Moye, Alec Paul Friswold, Clay Brian Beagles, Michael John Weaver¹

¹Brigham and Women's Hospital

INTRODUCTION:

Acetabular fractures are complex injuries that are associated with a high risk of posttraumatic arthritis. Conversion to total hip arthroplasty (cTHA) rates at 5 years are approximately 20% in many studies. Fractures with marginal impaction, significant articular comminution, or whose reduction is imperfect have a higher risk of developing posttraumatic arthritis. cTHA has been shown to have a higher risk of infection, dislocation, and are at increased risk of revision compared to primary THA. Our study seeks to understand if complication rates differ between patients who require cTHA within one year of their acetabular fracture fixation to those treated in a more delayed manner.

METHODS:

This was a retrospective cohort study of patients undergoing conversion total hip arthroplasty following open reduction/internal fixation (ORIF) of acetabular fractures at two ACS level 1 trauma centers. Patients were included if they were at least 18 years of age at the time of their fracture, treated with open reduction and internal fixation for an acetabular fracture, and required conversion to a total hip replacement following fracture fixation. Patients were excluded if they had a pathologic fracture, if their initial surgery was not for fracture management, or if follow up after their arthroplasty procedure was less than 12 months without complication. Demographic data, injury characteristics, initial fracture management, operative details of the cTHA, and postoperative complications were recorded. Descriptive statistics were used, and bivariate statistics were used to compare groups.

RESULTS:

A total of 107 patients met inclusion criteria, with 34 (31.8%) being female, and a median age of 53 (IQR 44 to 65) years. Eighteen patients had a traumatic hip dislocation at the time of their injury. There were 6 instances of preoperative nerve palsy and 3 iatrogenic nerve palsies from ORIF. There was 22 months (IQR 88 to 132) between fixation and cTHA. Indications for conversion were posttraumatic arthritis (98, 91.6%), AVN (4, 3.7%), nonunion without hardware failure (2, 1.9%), and hardware failure (3, 2.8%). Estimated Blood Loss (EBL) was 700 mL (IQR 500 to 1100 mL), operative time was 131 minutes (IQR 94 to 183 minutes), an average of 2.7 units (SD \pm 1.9) were transfused, and the most common disposition following discharge from the hospital was home with services (53.3%). Overall, complications occurred in 21.5% of patients, with postoperative dislocation being most common (10 patients, 9.4%), followed by loosening requiring revision surgery (9, 8.4%), infection requiring revision surgery (7, 6.5%), periprosthetic fracture (1, 1%), postoperative foot drop (1, 1%), and pulmonary embolism (1, 1%). Seven patients required reoperation within 30 days of cTHA (6.5%) and 24 patients required reoperation at some point following cTHA (22.4%).

Thirty-eight patients (36%) underwent cTHA within 1 year of fracture fixation. The indications for cTHA were different in the early and delayed populations, ($p = 0.006$), with 78% of patients with failure of prior fixation requiring early cTHA while 68% of patients with posttraumatic arthritis secondary to prior fixation underwent delayed cTHA. Early cTHA was shown to be significantly associated with increased EBL (1146 mL vs. 797 mL, $p = 0.03$) and increased length of stay (6.2 days vs. 3.6 days, $p < 0.005$). It also was associated with higher rates of readmission within 30 days (18.4% vs. 4.4%, $p = 0.02$), reoperation within 30 days (15.8% vs. 1.5%, $p < 0.005$), and need for revision surgery at any point (36.8% vs. 14.5%, $p < 0.01$), infection (13.2% vs. 2.9%, $p = 0.04$), and loosening requiring revision surgery (18.4% vs. 2.9%, $p < 0.01$). Later cTHA was associated with lower overall rates of postoperative complications (11.6% vs. 39.5%, $p = 0.001$).

DISCUSSION AND CONCLUSION:

Our data demonstrate significantly increased risk of complication in conversion to total hip arthroplasty following acetabular fracture fixation when the surgery is performed within 1 year of the injury. We found a higher risk of infection, dislocation, and loosening of the components when the surgery was performed early.