ORIF Versus Arthroplasty of Geriatric Acetabular Fractures: Results of a Randomized Controlled Feasibility Study

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Purpose: Geriatric acetabular fractures are a growing clinical challenge with diverse and controversial management strategies. Our goal was to determine the feasibility of a randomized controlled trial comparing open reduction and internal fixation (ORIF) to total hip arthroplasty with concomitant ORIF (THA). Our hypothesis was that a high percentage (>33%) of patients will be both eligible and willing to enroll in a randomized controlled trial.

Methods: The study design was a prospective randomized controlled trial with an observational arm for patients who refused randomization. From July 2011 to December 2013 all patients admitted with an acetabular fracture to a single trauma center were screened for study inclusion. Inclusion criteria were patients over age 60 with an acetabular fracture that had at least one of three characteristics previously identified to be associated with poor outcomes after ORIF in geriatric patients: (1) dome impaction, (2) posterior wall component, or (3) femoral head impaction injury. Exclusion criteria were physiologic inability to undergo surgery, clinical contraindication for either treatment arm, and severe dementia. Patients who declined randomization were treated with the patient's preferred method and included in the observational arm of the study. Patients in the ORIF group had standard plate and screw fixation through standard surgical approaches. Patients in the THA group underwent plate and screw fixation and then subsequent THA through the same approach and prep.

Results: Only 41.5% (27 of 65) patients with geriatric acetabular fractures met inclusion criteria. 33% (9 of 27, 95% confidence interval [CI]: 18-48%) of the eligible patients agreed to be randomized. Therefore only 14% (9 of 65, 95% CI: 0-27%, $P < 0.05$ from hypothesized 33% rate) of acetabular fractures over age 60 were eligible and agreed to enroll in a randomized controlled treatment trial. A larger percent (28% [n = 18], 95% CI: 11-45%) enrolled in the observational arm. The patients in the observational arm split evenly between ORIF (n = 9) and THA (n = 9). In the ORIF group (n = 15), 2 patients died in the index hospitalization, 2 had complications, and 25% have been converted to THA. In the THA group (n = 12) no patients died during the index hospitalization; there were no complications or repeat surgeries to date.

Conclusions: Multiple authors have argued that a randomized controlled trial is needed to determine the ideal treatment of geriatric acetabular fractures. To our knowledge, we report the first data from a prospective randomized trial indicating feasibility of such a study. In contrast to our hypothesis, only a small percentage of geriatric acetabular fracture patients were both eligible for the study and willing to be randomized (14%, n = 9 over 2.5 years). Our data indicate that a large consortium of clinical sites will likely be needed for such a randomized trial to succeed. Further, although all eligible patients agreed to participation in a study, they have strong treatment preferences that often make them unwilling to have their treatment randomized.

See pages 99 - 147 for financial disclosure information.