ORIF versus Arthroplasty of Geriatric Acetabular Fractures: Results of a Prospective Randomized Controlled Trial

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Purpose: Geriatric acetabular fractures are a growing clinical challenge that poses important unanswered questions including the relative performance of open reduction and internal fixation (ORIF) to total hip arthroplasty with concomitant ORIF (THA). Our hypotheses were 1. THA would have a higher short term complication rate, but would result in better validated outcome scores and 2. A clinical trial on this issue would be feasible.

Methods: The study design was a prospective randomized controlled trial with a prospective observational arm for patients who refused randomization. From 2011 to 2016 all patients admitted with an acetabular fracture to a single statewide referral trauma center were screened. Inclusion criteria were patients over age 60 with a *displaced* acetabular fracture that had at least one of three characteristics previously identified with poor outcomes after ORIF in geriatric patients: 1. Dome impaction, *or* 2. Posterior wall component *or* 3. Femoral head impaction. Exclusion criteria included physiologic inability to undergo surgery, clinical contraindication for either treatment arm, or severe dementia. Patients who declined randomization were treated with the patients' 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. All surgeries were performed by fellowship trained surgeons. The primary outcome measures were validated outcome scores (satisfaction (PS18), WOMAC, Harris Hip Score, SF36). Secondary outcome was unplanned reoperations.

Results: The study group consisted of 39 patients (18 ORIF, 21 THA, 16/39 randomized (41%), no differences in demographics between treatment groups). No patients were lost to follow-up (0%) and 24 patients have at least one year follow-up to date. In the ORIF group, 5/18 (28%) have been converted to THA for subsequent post traumatic osteoarthritis. There was one femoral nerve palsy and two deep infections in the ORIF group. One patient in the ORIF group underwent heterotopic ossification removal in preparation for THA. No dislocations or infections have occurred in the THA group. One patient in the THA group returned to the OR for a superficial wound dehiscence without infection.

In contrast to our hypothesis, there were no important clinical or statistical differences in any mean validated outcome scores at one year [(WOMAC: ORIF:15, THA: 18, p= 0.79.; Patient Satisfaction (PS18): ORIF:58,THA: 57, p=0.46; SF 36 mental, SF36 physical , and Harris Hip Scores all also p>0.20]. A post hoc power analysis revealed 80% power to detect a difference of 15 in the WOMAC score and 3 in the patient satisfaction score.

See pages 49 - 106 for financial disclosure information.

Fewer patients in the ORIF + THA group (1/21, 4.7%) required reoperation than those in the ORIF group (7/18, 38.8%) (p=0.015, Fischer's Exact).

Conclusions: In contrast to our expectation, patient satisfaction and functional scores were similar in the two treatment groups at one year and we did not observe increased complications in the THA group. Patient's treated with ORIF + THA required fewer reoperations than those treated with ORIF alone in this selected group of patients over the age of 60 with displaced acetabular fractures involving a posterior wall component *or* dome impaction *or* femoral head impaction.