

Open Reduction and Internal Fixation of Multifragmentary Fractures of the Radial Head Does Not Lead to Worse Outcomes Compared to Arthroplasty

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Purpose: Current dogma states that open reduction and internal fixation (ORIF) of radial head fractures comprised of 3 or more fragments should be avoided due to high failure rates, and instead, these injuries should be treated with radial head arthroplasty (RHA). We hypothesized that ORIF would be associated with worse outcomes than RHA for multifragmentary radial head fractures.

Methods: The retrospective cohort study included adult patients with a radial head fracture comprised of 3 or more fragments treated with either ORIF or RHA at a Level I trauma center from 2007 to 2018. The primary outcome measure was unplanned return to the operating room for a complication including revision arthroplasty, loss of fixation, removal of hardware, ligament repair, nerve lysis, nonunion, or malunion. Secondary outcomes included range of motion and the presence of pain at the last follow-up. The association between treatment and the study outcomes was tested using generalized linear models, which controlled for age, comminution, dislocation, fracture type, Mason fracture type, and the number of radial head fragments.

Results: The study included 125 patients with radial head fractures comprised of 3 or more fragments, 80 treated with ORIF who were younger and more likely to be male (mean age, 43 years; 25% female) than the 45 treated with RHA (mean age, 61 years; 75% female; $P < 0.05$). 19% of the ORIF patients experienced a postoperative complication requiring surgery compared to 17% of RHA patients (95% confidence interval [CI]: -21 to 14.5, $P = 0.72$). Only 1 patient experienced nonunion (1.3%), and 1 patient experienced malunion (1.3%) of the radial head requiring surgery in the ORIF group. Three patients (7%) in the RHA group had to undergo revision arthroplasty. The remaining reoperations in each group were related to removal of hardware, contracture, release, ligament repair, nerve lysis, or some combination of these issues. 65% of ORIF patients and 64% of RHA patients were able to achieve a $>100^\circ$ arc of forearm rotation at final follow-up ($P = 0.24$). Pain at the last follow-up was lower with RHA (47% vs 55%) but did not reach statistical significance ($P = 0.16$).

Conclusion: In contrast to existing dogma, we did not find that treatment with ORIF demonstrated worse outcomes than arthroplasty in terms of complications requiring surgery. This study provides additional data and indicates that clinicians should be aware that outcomes after RHA may not be superior to ORIF even in these comminuted fractures.