There Is No Difference in Long-Term Functional Outcomes Between Open Reduction and Internal Fixation and Radial Head Arthroplasty in Treating Radial Head Fractures

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Purpose: Radial head fractures can be treated with open reduction and internal fixation (ORIF) or radial head arthroplasty (RHA), but there is a paucity of long-term functional outcome data comparing these options. We hypothesized that arthroplasty would have better long-term functional outcomes than ORIF particularly for patients with more than three fracture fragments.

Methods: We recruited adult, English-speaking patients with a radial head fracture treated operatively between 2007 and 2018 with either ORIF or RHA at a Level I trauma center. Functional outcome was assessed using the QuickDASH, an abbreviated version of the Disabilities of Arm, Shoulder and Hand (DASH) questionnaire. 76 patients completed the QuickDASH, including 51 who underwent ORIF and 25 who underwent RHA. Median time between surgery and survey was 94 months (range, 24 to 156 months). Secondary outcomes included complication, reoperation, range of motion, and pain at last follow-up. ORIF patients compared with RHA patients were younger (mean age 45.8 years vs 59.1 years), predominantly male (88% vs 29%), lower body mass index (BMI; 28.2 vs 34.9 kg/m2), had less comminution (29% vs 64%) and less soft-tissue injury (39% vs 68%). Among the 33 participants with fractures with 3 or more fragments, 21 underwent ORIF and 12 underwent RHA.

Results: Long-term functional outcomes were similar for both treatment groups (mean difference = 0.2, 95% confidence interval [CI]: –9.0 to 9.3, $P = 0.97$). On average, the patients in both treatment groups included in this study recovered to a level of function that is within one standard deviation of the general population (10.1 ± 14.68). QuickDASH scores for both ORIF (15.7 ± 18.4) and RHA groups (22.8 ± 18.6) indicated a low level of disability, with higher QuickDASH scores indicating higher disability on a scale of 0 to 100. Similar results were observed for fractures with more than 3 fragments, with mean QuickDASH scores of 18.7 ± 17.2 in ORIF patients (standard deviation = 17.2) and 26.1 ± 19.0 in RHA patients (mean difference = –4.4, 95% CI: –19.0 to 10.2, $P = 0.54$).

Conclusion: In contrast to our hypothesis, we found similar long-term outcomes between ORIF and arthroplasty even in the subgroup of patients with multifragmentary fractures. These data indicate that ORIF and arthroplasty may provide similar long-term functional outcomes even for some of the worst fracture types. Although not statistically significant, RHA patients reported a higher average level of functional disability, which is likely due to demographic and injury factors as RHA patients were older, higher BMI, likely lower demand preoperatively, and had more soft-tissue injury in this cohort.