

Modern Treatment of 3 and 4-Part Proximal Humerus Fractures: ORIF Demonstrates Better Range of Shoulder Motion Than Reverse Total Shoulder Arthroplasty

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Purpose: This study investigates clinical outcomes of patients who sustained 3- or 4-part proximal humerus fractures (PHFs) treated with open reduction and internal fixation (ORIF) or reverse total shoulder arthroplasty (rTSA).

Methods: 102 patients who sustained 103 3- or 4-part PHFs were identified from a prospective database of PHF patients treated with ORIF by one of 3 fellowship-trained fracture surgeons. These patients were compared to 43 patients who underwent rTSA for a 3- or 4-part PHF by a fellowship-trained shoulder surgeon experienced in the technique. Clinical outcomes were assessed via chart review. Functional outcome scores for the ORIF cohort were assessed via the Disabilities of the Arm, Shoulder and Hand (DASH) survey and a generated American Shoulder and Elbow Surgeons (ASES) score. Functional outcomes for the rTSA group were assessed via the Simple Shoulder Test (SST), UCLA Shoulder Rating Scale, Constant Shoulder Score, and ASES Shoulder Survey. All patients had minimum 1-year follow-up.

Results: The ORIF and rTSA study groups were similar except for age and body mass index (BMI). Patients in the rTSA cohort were older and thinner with an average age of 75.7 years and BMI of 26.7 kg/m², compared to 62.8 years and average BMI of 29.4 in the ORIF cohort ($P < 0.001$, $P = 0.004$). Shoulder range of motion in patients who were treated with ORIF had an average active forward elevation of 130.8°, compared to 124.6° in the rTSA cohort ($P = 0.273$) and active external rotation of 44.2°, compared with 31.2° in the rTSA cohort ($P = 0.001$). At latest follow-up, no functional difference was seen between groups with patients in the ORIF cohort having a mean ASES score of 73.4 (± 23.7) and patients in the rTSA cohort a mean ASES score of 77.6 (± 13.7) ($P = 0.774$).

Conclusion: Patients who sustain 3- or 4-part proximal humerus fractures and are treated with reverse total shoulder arthroplasty tend to be older and have a lower BMI than those treated with ORIF. Functionally, patients treated with ORIF had greater final range of motion than those treated with rTSA. However, both strategies resulted in a functional range of shoulder motion. Functional outcome scores between groups were similar and reached population norms at latest follow-up.