

## Acute Versus Delayed Reverse Total Shoulder Arthroplasty for the Management of Proximal Humerus Fractures

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**Purpose:** Reverse total shoulder arthroplasty (rTSA) is effective and increasingly utilized for the management of proximal humerus fractures (PHFs) in the elderly. We sought to determine whether complications, functional outcomes, range of motion, and pain would differ between patients undergoing acute versus delayed rTSA for PHF. Previous studies on this subject have been small and heterogeneous. The question of optimal timing for rTSA for fracture is important because there are little data or consensus on which fractures require surgery (with the exception of certain uncommon patterns, such as head split or locked dislocation). The majority do not require an operation. Given the uncertainty regarding initial management, we investigated whether harm is done by waiting to perform surgery. The primary study aim was to compare the outcome of rTSA for PHF treated early (<28 days after injury) versus in a delayed fashion (>28 days after injury).

**Methods:** This was a retrospective cohort study of 115 patients with a history of ipsilateral PHF undergoing primary rTSA at 2 Level-I trauma centers and 1 academic community hospital from 2004-2016. Patient variables, complications, radiographic parameters, range of motion, and pain at follow-up were obtained by chart review. Functional outcomes (Disabilities of the Arm, Shoulder and Hand [DASH], Patient-Reported Outcomes Management Information System [PROMIS], and EuroQol 5 Dimensions [EQ-5D]) scores were obtained from patients by online survey. The 115 eligible patients were included in complications analysis and had an average of 1.3 years of clinic follow-up. 58 (40 early/18 late) had at least 1 year of follow-up and were included in the range of motion (ROM) and pain analysis, and 38 (28 early/10 late) had clinical outcomes scores collected, at an average of 5.5 years postoperatively. IRB approval was obtained for the study.

**Results:** There was no significant difference in complications (defined as dislocation, infection, new nerve palsy, revision for any reason, or death perioperatively) between groups. Overall complication rate was 11.3%. There was no significant difference in clinical outcomes scores, although there was a near-significant difference in DASH score, with an average score of 22.78 in acutely treated patients versus 34.82 in delayed patients (lower scores being better;  $P = 0.058$ ); this is greater than the minimal clinically important difference of 10.83 points. ROM differences also failed to meet statistical significance but demonstrated a trend towards superior forward flexion and external rotation in the acute group. There was no difference in the presence of pain, with about half of patients in each group reporting pain at last follow-up.

**Conclusion:** Our findings suggest that it is safe to trial nonoperative management in proximal humerus fractures whose patterns do not clearly require acute surgery, although there may be some downside with regard to function and ROM in patients who ultimately require rTSA.