Uncemented Versus Cemented Humeral Fixation in Reverse Shoulder Arthroplasty for Proximal Humerus Fractures in the Elderly: A Multicenter Retrospective Cohort Study

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Background: Among surgical interventions for proximal humerus fractures, RSA has been shown to have superior or noninferior outcomes to hemiarthroplasty or open reduction internal fixation. Cemented humeral fixation in RSA has been the traditional treatment method for proximal humerus fractures, however, there is a growing interest in uncemented humeral fixation. Both cemented and cementless RSA are currently used to treat proximal humerus fractures with few studies comparing postoperative outcomes of these 2 techniques. The aim of this study was to compare postoperative outcomes between cemented and uncemented humeral fixation following primary reverse total shoulder arthroplasty (RSA) for proximal humerus fractures.

Methods: This was a multicenter retrospective review of patients who underwent primary RSA for proximal humerus fractures between 2017 and 2020. Patients without at least 2-year follow-up and those undergoing revisions were excluded. Basic demographic and operative data were collected. The patients shoulder range of motion and visual analog scale (VAS) for pain were evaluated preoperatively and at final follow-up. Postoperative radiographic assessment was performed at minimum 2-year follow-up.

Results: A total of 107 patients undergoing RSA for proximal humerus fractures with a minimum of 2 years follow up were identified. Of these, 67 (62.6%) underwent a cementless humeral fixation while 40 (37.4%) underwent a cemented humeral fixation. Demographic variables were similar between groups. A history of osteoporosis was found to be higher in the cemented group (22.5% vs. 4.0%; $p=0.008$), but other diagnoses were similar between groups. Mean operative time (minutes) was significantly lower in uncemented fixation (123±37 vs. 180±47, $p=<0.001$) while length of stay (days) was significantly longer in uncemented fixation (3.9±3.5 vs. 2.1±2.2, $p=0.002$). Preoperative and final follow-up VAS pain scores were similar between the groups ($p>0.05$). External rotation was greater in the uncemented group (33°±18° vs. 28°±15°, $p=0.034$) while forward flexion and abduction were similar. Total postoperative complications were similar between groups and 4 (10.0%) required revision in the cemented group compared to 2 (3.0%, $p>0.05$) in the uncemented group. At final follow-up, 10 (27.8%) cemented stems demonstrated radiographic humeral stem lucency compared to 6 (10.9%, $p=0.039$) uncemented stems. Glenoid lucency, scapular notching, humeral stem migration, and tuberosity healing were similar between groups ($p>0.05$).

Conclusions: Uncemented RSA for treatment of proximal humerus fractures demonstrated decreased operative time and decreased rates of radiographic loosening when compared to cemented RSA. Despite longer length of stay, the use of uncemented stems in RSA does not result in inferior outcomes.