

Reverse Shoulder Arthroplasty Superior at Five Years Compared with Plate Fixation for Displaced Proximal Humeral Fractures in the Elderly. The DelPhi Study, A Randomized Controlled Trial

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Purpose: Treatment of displaced proximal humeral fractures (PHFs) is still controversial, and operative treatment is increasing despite sparse evidence on which operative treatment to prefer. We present midterm results of a clinical trial comparing reverse total shoulder arthroplasty (RTSA) vs plate fixation, where the hypothesis was that RTSA yields better clinical results.

Methods: This was a multicenter single-blinded randomized controlled trial comparing RTSA vs plate fixation for severely displaced AO/OTA type B2 and C2 PHFs in elderly patients. From January 2013 to May 2017, 124 patients aged 65-85 years were included and allocated to RTSA (64) or plate fixation (60). The primary outcome was Constant score (CS), and secondary outcomes were Oxford Shoulder Score (OSS) and radiologic measurements. The mean outcomes of the respective allocation groups were compared using independent sample t test, and linear mixed model analyses were used for subgroup analyses. Results were reported as mean difference with 95% confidence intervals (CIs).

Results: The mean age was 75 years, 90% were female, 104 patients completed 2-year follow-up and 65 patients completed 5-year follow-up. RTSA patients had a mean CS of 71.7 (standard deviation [SD] = 14.2) at 5 years, compared with 58.3 (SD = 19.0) in the plate fixation group, a significant mean difference of 13.5 (95% CI: 5.2, 21.7; P = 0.002) in favor of RTSA. Stratified for fracture type, type C2 PHFs scored 69.7 (95% CI: 63.4, 76.1) in the RTSA group and 52.3 (95% CI: 44.5, 60.1) in the plate fixation group, a significant mean difference of 17.5 (95% CI: 7.4, 27.5; P = 0.001) in favor of RTSA. There was no significant difference between the treatment allocations for type B2 fractures. Stratified for age, patients 65-74 years with RTSA had a mean CS of 73.5 (95% CI: 66.4, 80.7), compared with 62.5 (95% CI: 55.5, 70.0) for plate fixation, a significant mean difference of 11 (95% CI: 1.0, 21.0; P = 0.03) in favor of RTSA. For patients 75-85 years there was a nonsignificant difference of 9.6 points in favor of RTSA.

Conclusion: RTSA is superior to plate fixation for displaced AO/OTA type B2 and C2 PHFs in elderly patients at 5 years. The data suggest that patients aged 65-74 years and patients with C2 fractures profit the most.