Reverse Shoulder Arthroplasty for Proximal Humerus Fractures in Octogenarians: A Propensity-Matched Analysis of Implant Complications

Adam Mark Gordon, Jake M Schwartz, Andrew Ryan Horn, Kevin Kang, Jack Choueka, Ramin Sadeghpour

INTRODUCTION: Reverse shoulder arthroplasty (RSA) is commonly performed for proximal humerus fractures, with increasing indications in the elderly population. Octogenarian patients are generally characterized by a higher burden of comorbidities and an increased risk of perioperative complications. However, the risk of implant complications, including shoulder dislocations, aseptic loosening, and periprosthetic fractures, may differ between octogenarians (patients ≥80 years) and those under 80 years. The purpose of this study was to compare the incidence of implant complications and revision rates following reverse shoulder arthroplasty (RSA) for proximal humerus fractures in octogenarians (patients ≥80 years) versus patients under 80 years. By evaluating 2-year implant complications this study aims to assess the safety and effectiveness of RSA in the elderly population and provide insights for perioperative management in octogenarians.

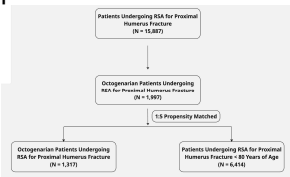
METHODS: A retrospective analysis was performed using a nationwide database (2010-2022). Octogenarian patients (N=1,317) who underwent RSA for proximal humerus fractures were identified and matched to patients < 80 years of age (N= 6,414) in a 1:5 ratio by sex, and comorbidities. Patients were excluded if they had a concurrent infectious etiology, malignancy, or revision involving the proximal humerus. Overall comorbidity burden was assessed between groups by the Elixhauser Comorbidity Index (ECI). Two-year implant complications, including shoulder dislocations, aseptic loosenings, periprosthetic joint infections (PJIs), periprosthetic fractures, and all-cause shoulder arthroplasty revisions, were compared between the two groups. Pearson chi square analyses compared categorical demographic variables. Multivariable logistic regressions were used to compute odds ratios (OR) with 95% confidence intervals (CI) for each implant complication, adjusting for sex, COPD, diabetes mellitus, hypertension, depression, congestive heart failures, obesity, tobacco use. The younger aged cohort were the reference cohort for statistical analyses. A p-value of <0.05 was considered statistically significant.

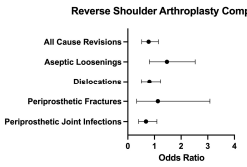
RESULTS:

Both groups of patients who underwent RSA for proximal humerus fractures were appropriately matched with no differences. Octogenarian patients had no difference in overall comorbidity burden (ECI: 7.0 vs. 6.9; P = 0.546) compared to younger aged patients. At 2 year follow-up, there was no significant difference in PJIs (OR: 0.68, P = 0.135), periprosthetic fractures (OR: 1.13, P = 0.820), shoulder dislocations (OR: 0.81, P = 0.355), aseptic loosenings (OR: 1.47, P = 0.177), or revisions (OR: 0.78, P = 0.231) between octogenarians and controls.

DISCUSSION AND CONCLUSION:

In conclusion, reverse shoulder arthroplasty appears to be a safe and effective treatment option for proximal humerus fractures in patients aged 80 years and older, with no increased risk of major implant complications or revisions at 2-year follow-up compared to younger patients. These findings support the continued use of RSA in appropriately selected elderly individuals and may aid surgeons in counseling patients and guiding perioperative decision-making in this growing patient population.





	Octogenarians		Controls		
Demographics	n	%	n	%	*P*-value
Age (Years)					**<0.0001**
< 50	43	0.7	0	0.0	
50 to 54	114	1.8	0	0.0	
55 to 59	311	4.8	0	0.0	
60 to 64	713	11.1	0	0.0	
65 to 69	1,097	17.1	0	0.0	
70 to 74	1,748	27.3	0	0.0	
75 to 79	2,388	37.2	0	0.0	
80+	0	0.0	1,317	100.0	
Sex					0.636
Female	1,158	87.9	5,672	88.4	
Male	159	12.1	742	11.6	
Comorbidities					
CHF	122	9.3	540	8.4	0.345
COPD	510	38.7	2,473	38.6	0.933
Depression	674	51.2	3,284	51.2	0.99
Diabetes Mellitus	627	47.6	3,051	47.6	0.99
Hypertension	1,258	95.5	6,144	95.8	0.713
Obesity	472	35.8	2,287	35.7	0.925
Tobacco Use	566	43.0	2,722	42.4	0.742
ECI	7.0		6.9		0.546

Table 1. Baseline Demographics of Octogenarian and Control Patients Undergoing Primary Reverse Shoulder Arthroplasty for Proximal Humerus Fracture.

CHF = Congestive Heart Failure; COPD = Chronic Obstructive Pulmonary Disease; * = <11 Patients; N/A = Stats Applicable.

	Octogenarians N (%)	Controls N (%)	OR	95% CI	*P*-value
PJIs	18 (1.4)	126 (2.0)	0.68	0.40 - 1.09	0.135
Periprosthetic Fractures	4 (0.3)	17 (0.3)	1.13	0.33 – 3.08	0.820
Shoulder Dislocations	24 (1.8)	141 (2.2)	0.81	0.51 – 1.23	0.355
Aseptic Loosenings	16 (1.2)	53 (0.8)	1.47	0.81 – 2.53	0.177
All-Cause Revisions	29 (2.2)	177 (2.8)	0.78	0.52 – 1.15	0.231

Table 2. Comparison of 2-Year Implant Complications for Octogenarian Patients Versus Controls Undergoing RSA for Proximal Humerus Fracture

OR = Odds-Ratio; 95% CI = 95% Confidence Interval
PJI= Peri-prosthetic joint infection
Reference is patients < 80
Bold values denote statistical significance to the *P* < 0.05 level
Logistic regression model controlled for sex, COPD, diabetes mellitus, hypertension, depression, congestive heart failure, obesity, tobacco use and Elixhauser Comorbidity Index.