

A Comprehensive Analysis of Age and 30-Day Complications Following Total Shoulder Arthroplasty: Nonagenarians, Octogenarians, and Septuagenarians

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INTRODUCTION: Increased age is a well-known risk factor for development of osteoarthritis. Total shoulder arthroplasty (TSA) is a common treatment option for patients with severe glenohumeral osteoarthritis. The purpose of this study was to investigate the association between the septuagenarian, octogenarian, and nonagenarian populations and postoperative outcomes following TSA.

METHODS: The American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) database was queried for all patients who underwent TSA between 2015 and 2020. Patients were divided into cohorts based on age: sexagenarians (60-69), septuagenarians (70-79), octogenarians (80-89), nonagenarians (90+). Multivariate logistic regression was used to identify associations between age and postoperative complications.

RESULTS SECTION: On bivariate analysis, compared to sexagenarians, septuagenarians were significantly associated with higher rates of myocardial infarction ($p = 0.038$), blood transfusion ($p < 0.001$), organ/space surgical site infection ($p = 0.048$), readmission ($p = 0.005$), and non-home discharge ($p < 0.001$). Compared to septuagenarians, octogenarians were significantly associated with higher rates of urinary tract infection ($p < 0.001$), blood transfusion ($p < 0.001$), readmission ($p = 0.002$), non-home discharge ($p < 0.001$), and mortality ($p = 0.027$). Compared to octogenarians, nonagenarians were significantly associated with higher rates of sepsis ($p = 0.013$), pneumonia ($p = 0.003$), reintubation ($p = 0.009$), myocardial infarction ($p < 0.001$), blood transfusion ($p < 0.001$), readmission ($p = 0.026$), non-home discharge ($p < 0.001$), and mortality ($p < 0.001$).

DISCUSSION: From age 60, each decade of age was identified to be an increasingly significant predictor for blood transfusion, readmission, and non-home discharge following TSA. From age 70, each decade of age was additionally identified to be an increasingly significant predictor for mortality. Limitations of this study include limitations to the data available on NSQIP, such as the postoperative complications only within the 30 day postoperative period.

SIGNIFICANCE/CLINICAL RELEVANCE: As the patient population continues to age, understanding the complications associated with increasing age may help to improve outcomes.

IMAGES AND TABLES:

Table 1. Bivariate analysis of postoperative complications following TSA between different age cohorts.

Postoperative Complication	Age 60-69		Age 70-79			Age 80-89			Age 90+		
	#	%	#	%	p-value	#	%	p-value	#	%	p-value
Sepsis	15	0.17%	10	0.10%	0.193	5	0.15%	0.852	2	1.20%	0.008
Septic shock	1	0.01%	7	0.07%	0.089	4	0.12%	0.033	0	0.00%	1.000
Pneumonia	36	0.40%	53	0.51%	0.227	24	0.72%	0.023	5	3.01%	<0.001
Reintubation	13	0.14%	14	0.14%	0.984	10	0.30%	0.059	2	1.20%	<0.001
Urinary tract infection	51	0.56%	71	0.69%	0.263	44	1.32%	<0.001	5	3.01%	<0.001
Stroke	5	0.06%	9	0.09%	0.408	6	0.18%	0.050	0	0.00%	0.999
Cardiac arrest	4	0.04%	4	0.04%	0.858	4	0.12%	0.156	0	0.00%	0.999
Myocardial infarction	18	0.20%	37	0.36%	0.038	8	0.24%	0.652	4	2.41%	<0.001
Bleeding transfusions	88	0.97%	200	1.94%	<0.001	125	3.75%	<0.001	18	10.84%	<0.001
Deep vein thrombosis	24	0.26%	30	0.29%	0.723	17	0.51%	0.038	0	0.00%	0.998
Pulmonary embolism	25	0.28%	28	0.27%	0.963	12	0.36%	0.444	2	1.20%	0.044
Ventilator > 48 hours	4	0.04%	12	0.12%	0.092	7	0.21%	0.013	1	0.60%	0.019
Deep incisional SSI	9	0.10%	5	0.05%	0.200	0	0.00%	0.999	0	0.00%	0.999
Superficial incisional SSI	25	0.28%	19	0.18%	0.188	10	0.30%	0.818	1	0.60%	0.442
Organ/space SSI	24	0.26%	14	0.14%	0.048	4	0.12%	0.143	0	0.00%	0.998
Wound dehiscence	6	0.07%	3	0.03%	0.246	2	0.06%	0.906	0	0.00%	0.999
Readmission	218	2.40%	315	3.06%	0.005	139	4.17%	<0.001	13	7.83%	<0.001
Reoperation	129	1.42%	123	1.19%	0.165	50	1.50%	0.742	1	0.60%	0.390
Non-home discharge	416	4.58%	911	8.84%	<0.001	761	22.82%	<0.001	80	48.19%	<0.001
Mortality	9	0.10%	12	0.12%	0.714	10	0.30%	0.016	4	2.41%	<0.001

SSI, surgical site infection

