

Rheumatoid Arthritis is associated with Higher 90-Day Systemic Complications compared to Osteoarthritis after Total Shoulder Arthroplasty: A Cohort Study

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INTRODUCTION: Total shoulder arthroplasty (TSA) in patients with rheumatoid arthritis (RA) can present unique challenges. Understanding the comprehensive risk profile of RA patients is important for informed decision-making when considering surgical intervention. As such, the aim of this study was to compare both systemic and joint-related postoperative complications in patients undergoing primary TSA for the indication of rheumatoid arthritis versus primary osteoarthritis (OA).

METHODS:

Using the TriNetX database, Current Procedural Terminology (CPT) and International Classification of Disease-10 (ICD-10) codes were used to identify patients who underwent primary TSA. Patients were categorized into two cohorts: patients undergoing TSA with a prior diagnosis of rheumatoid arthritis (RA-TSA) and patients undergoing TSA with primary osteoarthritis (OA-TSA). After 1:1 propensity score matching was performed, postoperative systemic complications within 90 days following primary TSA and joint complications within 5 years following anatomic (aTSA) and reverse (RSA) shoulder arthroplasty specifically were compared between the two cohorts.

RESULTS: Prior to propensity score matching, the RA-TSA cohort consisted of 8588 patients, and the OA-TSA cohort consisted of 54,976 patients. Each cohort included 8523 patients after propensity matching. Patients with RA had a significantly higher risk within 90 days postoperatively of total complications (odds ratio [OR] 1.50, p<0.001), deep SSI (OR 2.30, p=0.024), wound dehiscence (OR 2.92, p=0.001), pneumonia (OR 1.60, p=0.004), myocardial infarction (OR 1.82, p=0.005), acute renal failure (OR 1.63, p<0.001), UTI (OR 1.61, p=0.003), mortality (OR 2.00, p<0.001), and readmission (OR 1.37, p=0.012) when compared to the OA-TSA cohort. Within 5 years after aTSA, patients with RA had a significantly greater risk of periprosthetic joint infection (OR 1.69, p=0.004) and prosthetic dislocation (OR 1.58, p=0.001) compared to patients with OA. Within 5 years after RSA, RA patients had a significantly greater risk of periprosthetic joint infection (OR 1.89, p=0.003), prosthetic dislocation (OR 1.78, p<0.001), and scapular fracture (OR 2.15, p<0.001).

DISCUSSION AND CONCLUSION:

Following TSA, RA patients should be considered at higher risk of systemic and joint complications compared to patients with primary OA. Knowledge of the risk profile of RA patients undergoing TSA is essential for appropriate patient counseling and education.

Table 1: 90-Day Postoperative Systemic Complications for matched RA-TSA and OA-TSA

Outcome	Incidence (%)		OR	95% CI	P value
	RA-TSA	OA-TSA			
Total Complications	3.61	2.45	1.50	1.21, 1.85	0.000
Wound Dehiscence	0.38	0.13	2.92	1.47, 5.79	0.001
Superficial SSI	0.33	0.23	1.40	0.79, 2.45	0.248
Deep SSI	0.27	0.12	2.30	1.10, 4.84	0.024
Deep Vein Thrombosis	0.63	0.41	1.54	0.99, 2.40	0.052
Pulmonary Embolism	0.50	0.56	0.90	0.59, 1.38	0.632
Myocardial Infarction	0.74	0.41	1.82	1.19, 2.79	0.005
Pneumonia	1.30	0.82	1.60	1.16, 2.20	0.004
Acute Renal Failure	1.81	1.11	1.63	1.24, 2.15	0.000
Urinary Tract Infection	1.46	0.91	1.61	1.17, 2.23	0.003
Readmission	1.76	1.29	1.37	1.07, 1.76	0.012
Stroke	0.38	0.31	1.21	0.71, 2.06	0.485
Mortality	1.32	0.67	2.00	1.45, 2.75	0.000
Blood Transfusion < 72 hours	0.66	0.43	1.52	1.00, 2.30	0.048

Table 2: 5-Year Postoperative Joint Complications for matched RA and OA patients by Reverse and Anatomic TSA

Outcome	Reverse TSA				Anatomic TSA			
	Incidence (%)		OR	P value	Incidence (%)		OR	P value
	RA	OA			RA	OA		
Periprosthetic Fracture	1.86	2.20	0.84	0.409	1.09	0.86	1.27	0.212
Prosthetic Dislocation	5.13	2.92	1.78	0.000	2.65	1.69	1.58	0.001
Periprosthetic Joint Infection	2.61	1.39	1.89	0.003	1.39	0.83	1.69	0.004
Revision TSA	4.06	3.12	1.32	0.093	2.16	2.25	0.96	0.749
Scapular Fracture	4.92	2.35	2.15	0.000	-	-	-	-