

The Impact of Mental Health on Major Complications Following Total Shoulder Arthroplasty

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INTRODUCTION: The volume of total shoulder arthroplasty (TSA) has seen a remarkable surge over the past decade in the United States. This increase can be attributable to a combination of factors including the refinement of surgical techniques and implants, increased physician familiarity, expansion of indications, and a rise in the activity levels of the aging population. With this increase in utilization, it is important to identify risk factors that can influence outcomes, complications, and resource utilization following TSA. Recent research demonstrates that patients who suffer from musculoskeletal pain, especially those who have undergone orthopedic procedures, show heightened instances of depression. Although previous studies have highlighted suboptimal outcomes in patients with depression following orthopedic procedures, the magnitude and implications of these outcomes are not yet fully understood. The purpose of this study was to examine the relationship between patients with a diagnosis of depression or anxiety and the risk of major postoperative complications following TSA. We hypothesized that patients with depression or anxiety would be associated with an increased risk for major complications.

METHODS: The TriNetX Research Network database was queried on May 30, 2023 for patients who underwent total shoulder arthroplasty, with and without a diagnosis of depression or anxiety. Patient cohorts and outcomes were defined using International Classification for Disease, 10th Edition (ICD-10) diagnosis codes and Current Procedural Terminology (CPT) codes. Patients with either depression or anxiety were placed into the depression/anxiety cohort, and patients without either diagnosis were placed into the no depression/anxiety cohort. Following the definition of cohorts, propensity score matching was performed for the two cohorts based on age, race, gender, diabetes mellitus, obesity, ischemic heart disease, hypertension, chronic lower respiratory disease, and use of central nervous system medications. After propensity score matching, these two cohorts were analyzed for differences in major outcomes within two years following the initial procedure, including dislocation of prosthesis, periprosthetic joint infection, periprosthetic fracture, revision TSA, vascular injury, and nerve injury.

RESULTS SECTION: Following propensity score matching, major complications within 2 years were compared between the two cohorts (Table 2). Compared to patients with no depression or anxiety, patients with either depression or anxiety were identified to have a higher risk for dislocation (OR 1.502, 95% CI 1.285-1.756; $p < 0.001$), periprosthetic joint infection (OR 1.309, 95% CI 1.123-1.525; $p = 0.001$), periprosthetic fracture (OR 1.661, 95% CI 1.341-2.056; $p < 0.001$), and revision TSA (OR 1.316, 95% CI 1.150-1.506; $p < 0.001$) within 2 years after the initial procedure. Patients with depression or anxiety were not identified to be at higher risk for vascular injury or nerve injury following TSA.

DISCUSSION: Overall, this study showed that patients who have depression and/or anxiety have a higher risk for dislocation, periprosthetic joint infection, revision TSA, and periprosthetic fracture two years after undergoing TSA surgery. Further research is necessary to better understand the mechanisms driving these associations and develop possible intervention strategies to optimize outcomes for patients undergoing TSA battling depression and/or anxiety. Limitations of this study include inability to differentiate between anatomic and reverse TSA based on CPT code.

SIGNIFICANCE/CLINICAL RELEVANCE: As healthcare moves towards holistic patient care, it is important to recognize the potential interplay between psychological health and surgical outcomes, both to improve surgical outcomes and for patients' overall well-being and recovery trajectory.

IMAGES AND TABLES:

Table 1. Comparison of major complications following total shoulder arthroplasty between patients with/without anxiety/depression.

Complication	Depression/anxiety (n = 13,392)		No depression/anxiety (n = 13,392)		Odds Ratio	95% CI	p-value
	Number	Percent	Number	Percent			
Dislocation	403	3.0%	271	2.0%	1.502	1.285-1.756	<0.001
Periprosthetic joint infection	386	2.9%	297	2.2%	1.309	1.123-1.525	0.001
Periprosthetic fracture	226	1.7%	137	1.0%	1.661	1.341-2.056	<0.001
Revision TSA	506	3.8%	388	2.9%	1.316	1.150-1.506	<0.001
Vascular injury to upper extremity	11	0.1%	10	0.1%	1.100	0.467-2.591	0.827
Injury to brachial plexus	29	0.2%	32	0.2%	0.906	0.548-1.498	0.701