Occupational Therapy and Comorbidities: Predictors of 90-Day Readmissions After Total Shoulder Arthroplasty

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INTRODUCTION: The incidence of total shoulder arthroplasty (TSA) is exponentially increasing due to an aging population. Hospital readmissions following TSA are associated with significant patient morbidity and mortality. Occupational therapy (OT) is often involved in the acute postoperative care of TSA patients, especially those with a lower functional status requiring assistance with activities of daily living (ADLs). As such, OT performed during the index hospital stay may give insight as a predictor of patient readmission. The objective of this retrospective study was to investigate predictive factors for readmission by comparing patient comorbidities and the incidence of OT between those readmitted and nonreadmitted within 90-days after discharge.

METHODS: Patients who underwent primary anatomic or reverse TSA from January 2020 to December 2022 were queried from a single institutional orthopedic database. Patients were excluded if they were < 18 years old, underwent hemiarthroplasty, had a hospital length of stay $\geq$ 2 days, or had inadequate documentation. All data was analyzed using the Statistical Package for Social Sciences (SPSS) version 29.0 (IBM; Armonk, NY). Student's T-test was used for continuous variables and Pearson's Chi-square Test for categorical variables. P values ≤ 0.05 were considered statistically significant.

RESULTS SECTION: 1781 patients met inclusion criteria. Of these, 1563 were nonreadmitted and 73 were readmitted within 90-days. There was no difference in procedure type between groups with 1440 (92.1%) of the nonreadmitted group and 70 (95.9%) of the readmitted having a reverse TSA, $P = 0.239$. There was also no difference between groups based on age, gender, tobacco use, or BMI > 40. Patients who were readmitted, however, were more likely to carry the diagnosis of anemia, congestive heart failure, chronic obstructive pulmonary disease, cancer, diabetes, chronic kidney disease, or liver disease. Readmitted patients were also more likely to have been visited by occupational therapy during the index hospitalization (93.2%) compared to the nonreadmitted group (67.6%), $P <0.001$. Further details on demographic, comorbidity, and occupational therapy characteristics are presented in Table 1, 2 and 3.

DISCUSSION: A better understanding of factors associated with 90-day readmissions after TSA is needed to risk stratify patients and improve patient care. Our findings support the current literature which suggests increased risk for readmission after TSA is multifactorial. Although medical comorbidities have previously been shown to increase risk of readmission, to the knowledge of the authors, this study is the first to evaluate occupational therapy as a potential predictor of readmission. Occupational therapists are uniquely positioned in the evaluation and care of postoperative TSA patients, especially those with a lower functional status. Patients with a high comorbidity burden and those requiring the assistance of occupational therapy had a greater rate of readmission. These patients would likely benefit from a higher discharge level of care and close follow up to reduce patient morbidity and mortality. Limitations of this retrospective study include the identification of medical comorbidities, which did not specify timing of diagnoses and thus may not have applied to the patient at the time of surgery. Additionally, although the factors identified were correlated with a higher rate of 90-day readmission and may be interpreted as strong associations, they do not establish causality.

SIGNIFICANCE/CLINICAL RELEVANCE: This is the first study to investigate occupational therapy during the index hospital stay as a predictor for hospital readmission within 90-days after TSA. Patients who underwent occupational therapy after TSA and have a high medical comorbidity burden, are more likely to be readmitted and should be considered for a higher discharge level of care and close follow up.

IMAGES AND TABLES:

Table 1 Demographic, Comorbidity, and Occupational Therapy Characteristics[a]

Variable	Nonreadmitted	Readmitted	*P* Value
Demographics			
Total	1563	73	
Age (mean, yr)	69.7	71.2	0.163
Female (%)	57.2	50.7	0.272
Tobacco use (%)	11.6	8.3	0.212
Comorbidities (%)			
BMI > 40 kg/m^2	12.2	16.4	0.278
Anemia	4.2	38.4	**<0.001**
CHF	3.9	27.4	**<0.001**
COPD	4.6	20.5	**<0.001**
Cancer	1.7	5.5	**0.018**
Diabetes	10.8	43.8	**<0.001**
Kidney disease	5.8	31.5	**<0.001**
Liver disease	1	5.5	**<0.001**
OT in hospital[b] (%)			
Y	67.6	93.2	**<0.001**
N	32.4	6.8	

[a]Bold indicates a statistically significant difference between groups (*P* < 0.05). BMI=body mass index,
CHF=congestive heart failure, COPD=chronic obstructive pulmonary disease, OT = occupational therapy