

# Malnutrition as a Predictor of Postoperative Outcomes in Total Shoulder Arthroplasty: A Single Hospital System Retrospective Study

Michael Copeland<sup>1</sup>, Leina Lunasco<sup>1</sup>, Michael Hughes<sup>1</sup>, Shameel Abid<sup>1</sup>, Ronak J. Mahatme<sup>1</sup>, Shawn A. Moore<sup>1</sup>, Anish Gangavaram<sup>1</sup>, Brian Grawe<sup>1</sup>

<sup>1</sup>University of Cincinnati College of Medicine Department of Orthopaedic Surgery, Cincinnati, OH

Disclosures: No disclosures to declare.

**INTRODUCTION:** Total shoulder arthroplasties (TSAs) have more than doubled over the past decade<sup>1</sup>. As TSA incidence increases, understanding risk factors that influence outcomes is crucial. Assessment of nutritional status is commonly performed using serum albumin levels. Hypoalbuminemia (serum albumin <3.5 g/dL) has been shown to increase postoperative complications after TSAs in nationwide analyses<sup>2</sup>; however, research is lacking within single academic institutions. The focus of this study is to fill in gaps in understanding of local trends in the nutritional status of TSA patients and its relationship with postoperative complications.

**METHODS:** This retrospective cohort study on TSA patients treated was conducted at a tertiary medical center between May 2011 and August 2024. Patients were stratified based on preoperative albumin levels obtained within 30 days of surgery. Patients with albumin levels <3.5 g/dL were classified as malnourished. Demographic factors, comorbidities, and intraoperative factors were recorded. The main outcomes were the incidence of 90-day postoperative complications and reoperations within 1 year of surgery. Data was analyzed using chi-squared tests adjusted with propensity score analysis. For continuous outcomes a weighted linear regression model (Weighted Least Squares) was used. For the binary outcome Readmission, weighted logistic regression models were employed. All p-values were two-sided, and a significance level of p<0.05 was used. All patients consented to their information being used and an IRB was approved.

**RESULTS:** An initial sample size of 367 patients was collected. After propensity score matching, 273 patients were identified, of which, 11 had low serum albumin and 262 had normal serum albumin. The malnourished cohort had increased Estimated Blood Loss of 51.5 mL (95% CI 24.6-78.3, p < 0.001), pulmonary complications (OR=5.489, p = 0.0362) and readmissions (OR=2.227, p<0.001) when compared to patients with normal albumin levels. It is to be noted that after propensity analysis the following variables were still unbalanced due to lack of sample size: age at surgery, American Society of Anesthesiologists (ASA), sex, hyperlipidemia (HLD), hypertension (HTN), hypothyroidism, anemia, and diabetes.

**DISCUSSION:** This study found that low serum albumin is associated with a greater incidence of postoperative complications in TSA patients, specifically pulmonary outcomes and readmission rates. Malnourished patients were 5 times more likely to experience pulmonary complications and 2 times more likely to be readmitted within 90 days of surgery when compared to patients with normal albumin levels. Malnourished patients also lost 50 mL more blood on average during the procedure. After propensity score analysis, several variables were still unbalanced due to the small sample size. A limitation of this study is malnourished cohort size; an increase of which would allow for comparison of additional postoperative variables. Serum albumin is a cost-effective way to assess a patient's risk factors prior to surgery. This data highlights the value of preoperative nutritional screening as an assessment of risk for post operative TSA complication. Further research could aid in pre- and post-operative TSA management guidelines of malnourished status to reduce complication risk.

**SIGNIFICANCE/CLINICAL RELEVANCE:** This study supports previous findings from national databases within a single hospital system. Further research could help revise current guidelines for malnourished surgery patients.

## REFERENCES:

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**ACKNOWLEDGEMENTS:** There are no acknowledgments to declare. This study received no funding.

**IMAGES AND TABLES:** N/A