

# Monoclonal Gammopathy of Undetermined Significance is Associated With Similar Two-Year Revision Rates but Increased Hospital Readmission After Total Shoulder Arthroplasty

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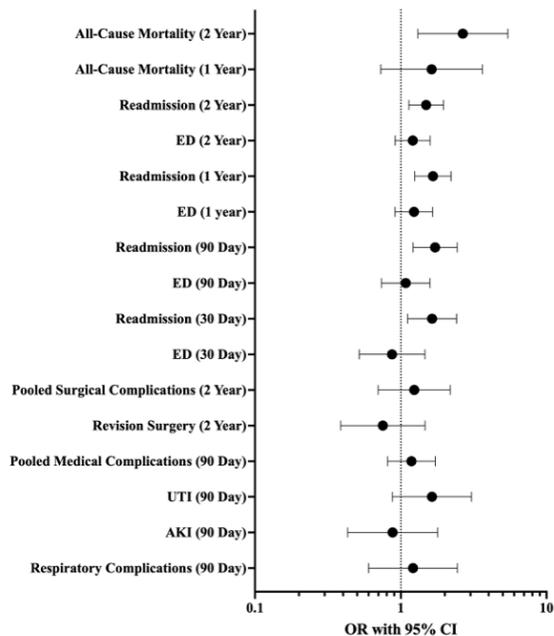
**INTRODUCTION:** Monoclonal gammopathy of undetermined significance (MGUS) is a plasma cell disorder largely classified as a benign precursor to multiple myeloma (MM). Considerable literature suggests that MGUS is implicated in skeletal fragility, however, this premalignant condition remains underexplored in orthopaedics. This study aimed to evaluate postoperative complications following total shoulder arthroplasty (TSA) in patients with MGUS.

**METHODS:** The TriNetX network was used to perform a retrospective cohort analysis of adult patients who underwent primary TSA from 2005 to 2023. Propensity score matching (1:1) was performed for demographics, comorbidities, and body mass index, generating two matched cohorts: (1) MGUS patients undergoing TSA; and (2) patients without MGUS undergoing TSA. Postoperative medical complications were analyzed at 90 days, and surgical complications were examined at 2 years. Healthcare utilization and all-cause mortality were assessed at 30 days, 90 days, 1 year, and 2 years postoperatively. Individuals with MM prior to TSA were excluded. Odds ratios (OR) with 95% confidence intervals (CI) were calculated from comparative analyses.

**RESULTS:** A total of 736 propensity-matched TSA patients were analyzed (MGUS: 151 males, 206 females; Non-MGUS: 150 males, 208 females). Both cohorts were adequately matched for age, race, sex, morbidities, and body mass index (all  $P > 0.05$ ). MGUS was not associated with increased odds of two-year revision rates (OR 0.752, 95% CI 0.386-1.463,  $P = 0.400$ ), or pooled surgical composite (OR 1.234, 95% CI 0.698-2.182,  $P = 0.469$ ). MGUS patients had higher odds of hospital readmission at all intervals (30 days: OR 1.637, 95% CI 1.112-2.408,  $P = 0.012$ ; 90 days: OR 1.718, 95% CI 1.212-2.436,  $P = 0.002$ ; 1 year: OR 1.659, 95% CI 1.245-2.209,  $P = 0.001$ ; 2 year: OR 1.490, 95% CI 1.133-1.961,  $P = 0.004$ ) and increased all-cause mortality (OR 2.663, 95% CI 1.307-5.428;  $P = 0.005$ ) 2 years after TSA. MGUS patients were not more likely to experience any medical adverse events at 90 days, including acute kidney injury (OR 0.877, 95% CI 0.431-1.784,  $P = 0.718$ ), respiratory complications (OR 1.210, 95% CI 0.600-2.440,  $P = 0.593$ ) and UTI (OR 1.635, 95% CI 0.875-3.054,  $P = 0.120$ ).

**DISCUSSION:** MGUS was associated with persistently higher odds of hospital readmission and all-cause mortality at 2 years, but similar two-year revision rates after TSA compared to matched controls. The postoperative risk profile associated with this condition warrants additional investigation to confirm and expand these findings across orthopaedic surgery.

**SIGNIFICANCE/CLINICAL RELEVANCE:** MGUS does not appear to impair TSA implant survivorship but is associated with greater hospital readmission and long-term mortality risk. Increased perioperative vigilance and interdisciplinary management may be required in this patient population.



**Figure 1.** Forest plot of postoperative outcomes in adult patients undergoing TSA, comparing MGUS to Non-MGUS. Odds Ratios (OR) and 95% confidence intervals (CIs) are shown. (AKI, Acute Kidney Injury; ED, Emergency Department; UTI, Urinary Tract Infection).