Predictors of Failing Same Day Discharge after Shoulder Arthroplasty: Developing a Model to Improve Outcomes and Reduce Healthcare Cost

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INTRODUCTION:

There is increasing interest in transition of shoulder arthroplasty from the inpatient to the ambulatory surgery setting as a method of increasing patient satisfaction while decreasing healthcare costs. However, little is known about predictive factors of failure of same day discharge (SDD) in the outpatient shoulder arthroplasty setting. Therefore, the purpose of this study was to identify predictors of failing SDD after shoulder arthroplasty, and to develop a predictive model to identify which patients may require postoperative admission.

METHODS: Following Institutional Review Board (IRB) approval, a retrospective review of all consecutive patients with rotator cuff pathology or osteoarthritis treated with primary anatomic or reverse total shoulder arthroplasty (TSA and RSA, respectively) between January 2019 and June 2023 was conducted. All patients were intended for same-day discharge. General endotracheal anesthesia was used for both groups, although patients undergoing TSA underwent preoperative interscalene block, while RSA patients received postoperative interscalene blocks to allow for neurologic examination in the recovery room. Demographics including age, gender, body mass index (BMI), race, median income, Charlson Comorbidity index (CCI), preoperative opioid use, and preoperative steroid injections were collected. Additionally, intraoperative metrics including American Society of Anesthesiologist (ASA) score, surgical/anesthesia time, surgical start time, and blood loss were collected. Multivariate logistic regression was used to identify predictors of failure of SDD. Results were displayed as odds ratios (OR) and 95% confidence intervals (CI). The alpha threshold was set to $p < 0.05$.

RESULTS: A total of 427 patients were identified over the study period. Arthroplasty performed for fractures, patients under 60 years of age, and patients with incomplete data were excluded, yielding a final cohort of 337 patients (64 TSA, 273 RSA). Included patients had an average age of 71.5 $\pm$ 6.6 years and average BMI of 30.5 $\pm$ 6.3 kg/m^2. Overall, there were 94 failures of SDD (27.9%). According to multivariate results, we found older age (OR: 1.44, p=0.004), later anesthesia start time per hour (OR: 6.02, p=0.017), preoperative opioid use within the past year (OR: 1.81, p=0.046), and female gender (OR: 2.76, 0.001) as statistically significant risk factors for not achieving SDD. Additionally, each half hour increase in length of time under anesthesia was statistically significant, increasing odds of failing SSD by 4.28 per half hour (p=0.000). Surgical time, however, was not statistically significantly predictive. Lastly, the surgical indication was statistically significant with rotator cuff arthropathy having 3.40 greater odds of failing to achieve SDD as compared to osteoarthritis (p=0.000). Overall, the model had a high level of predictability, yielding an area under the curve (AUC) value of 83%, Figure 1.

DISCUSSION AND CONCLUSION:

Older age, female gender, higher ASA score, preoperative opioid use, and prolonged anesthesia exposure were significant predictors of failure of SDD after shoulder arthroplasty for rotator cuff pathology and/or osteoarthritis pathology. These risk factors may be considered for counseling high-risk patients of an unplanned hospital admission. Additionally, our results suggest that collaboration between surgeons and anesthesia teams may allow for more accurate risk stratification and optimize resource utilization when deciding which patients are appropriate candidates for SDD.

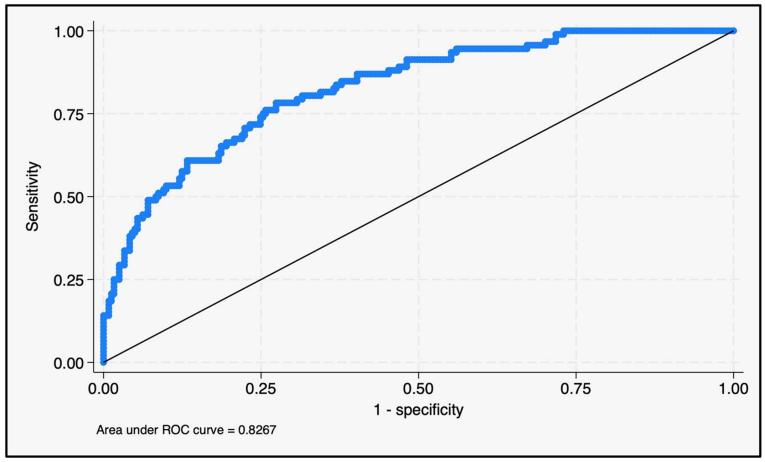

Figure 1 – Receiver operator curve (ROC) of the final logistic regression model that considers patient age, sex, American Society of Anesthesiologist (ASA) score, preoperative opioid status, and anesthesia time as a predictor of failure of same day discharge following shoulder arthroplasty