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Original article

Safety of next-day discharge following laparoscopic sleeve gastrectomy

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Abstract

Background: The safety of next-day discharge after laparoscopic sleeve gastrectomy (SG) for the treatment of morbid obesity has not been well studied. The objective of this study was to determine if next-day discharge after laparoscopic SG was comparable to standard discharge (i.e., post-operative day [POD] 2) with respect to the rate of 30-day adverse events.

Methods: A retrospective cohort analysis was performed. Patients were selected if they underwent a laparoscopic SG for morbid obesity between 2010 and 2012 and discharged on either POD 1 or 2. The primary outcome was the 30-day adverse event rate, which was a composite endpoint of complications, mortality, or reoperations. A multivariable logistic regression was performed to determine an adjusted odds ratio (OR) of 30-adverse events for next-day discharge.

Results: There were 2982 (37.4%) and 4985 (62.6%) patients discharged on POD 1 and 2, respectively. Both groups were comparable with respect to clinical characteristics. The adjusted OR for 30-day adverse events with next-day discharge was .75 ($P = .08$, 95% CI [.55–1.04]). Pre-operative hypertension and dyspnea were significant predictors of adverse events for next-day discharge.

Conclusion: Based on data from the ACS-NSQIP registry, laparoscopic SG patients discharged on POD 1 did not have a worse rate of 30-day adverse events compared to the POD 2 group. Appropriate perioperative evaluation may help surgeons implement next-day discharge for select patients after uncomplicated laparoscopic SG. (Surg Obes Relat Dis 2015;11:525–529.)

Keywords: Morbid obesity; Laparoscopic sleeve gastrectomy; Next-day discharge

The laparoscopic sleeve gastrectomy (SG) continues to become an increasingly popular operation and now accounts for almost 28% of bariatric procedures worldwide [1]. The laparoscopic SG appears to be safe with a favorable risk profile compared with other available surgical options [2–4]. As well, the laparoscopic SG as a definitive operation has proven to be clinically effective in the treatment of morbid obesity [5–8].

Within bariatric centers of excellence, very good clinical outcomes after laparoscopic SG can be achieved with relatively short hospital stays [9]. In fact, participating hospitals in the American College of Surgeons' Bariatric Surgery Center Network reported mean hospital stays between 2 and 3 days for both laparoscopic Roux-en-Y gastric bypass and SG operations [2]. Furthermore, bariatric centers are increasingly implementing next-day discharge protocols for select patients in an effort to improve resource utilization [7,10].

The purpose of this study was to evaluate the safety of next-day discharge after laparoscopic SG by comparing the 30-day adverse event rate in patients discharged the

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next-day versus those discharged on postoperative day (POD) 2.

Methods

Data source

A retrospective cohort analysis was performed using data from the American College of Surgeons' National Surgical Quality Improvement Program (ACS-NSQIP) between 2010 and 2012. The ACS-NSQIP is a nationally validated, risk-adjusted database that uses well-defined variables to capture 30-day clinical outcomes on patients undergoing major operations [11–15]. The study protocol was approved by the Institutional Research Ethics Board.

Patient selection

Patients were selected from the ACS-NSQIP participant use data files using the current procedural terminology code 43775. Patients included in the study must have undergone a laparoscopic SG for the treatment of morbid obesity between 2010 and 2012 and discharged on either POD 1 or 2. Patients were excluded if they had prior surgery within 30 days, a relative contraindication to bariatric surgery, or any recorded complication/death during their principal admission.

Statistical analysis

Differences in baseline demographic characteristics, co-morbidities, and outcomes were described. A univariate analysis was performed to compare patient characteristics across both groups. A Fisher's exact test was used to compare categorical variables and a 2-tailed t test to compare continuous variables. An adverse event was defined as a composite outcome for any complication, mortality, or reoperation. Complications were defined as the following diagnoses: pneumonia; superficial and deep incisional surgical site infections; abdominal sepsis; bleeding transfusions; unplanned intubation; pulmonary embolism; deep venous thromboembolism; stroke; myocardial infarction; cardiac arrest; sepsis/septic shock; and urinary tract infections. A multivariable logistic regression analysis was performed to adjust for confounding and identify possible significant predictors of 30-day adverse events. Independent predictors were chosen a priori and included the following demographic and clinical variables: age; body mass index (BMI) $\geq$ 50 (i.e., super-obesity); male sex; positive smoking status; dependent functional status; operative time; preoperative hypertension; history of diabetes; preoperative dyspnea; history of bleeding disorder; and steroid use for chronic conditions. All statistical analyses were performed using SAS v9.3 software (Cary, NC).

Results

A total of 7967 patients underwent a laparoscopic SG during the study period. There were 2982 (37.4%) and 4985 (62.6%) patients discharged on POD 1 and 2, respectively (Table 1). A comparison of patient demographic characteristics between groups revealed statistical differences with respect to the proportion of females (75.4% versus 77.4%; $P = .04$), mean BMI (45.5 versus 46.5; $P < .001$), and mean operative minutes (89.6 versus 96.6; $P < .001$). Considering co-morbidities, only patients with chronic obstructive pulmonary disease (0.4% versus 1.3%; $P < .001$) and preoperative dyspnea (11.9% versus 15.3%; $P < .001$) were found to be statistically different with fewer patients in the next-day discharge group. With respect to study outcomes, 167 (2.1%) patients had at least 1 postoperative complication, 55 (0.7%) patients underwent a reoperation, and 2 (0.03%) patients died (Table 2). In total, there were 200 (2.5%) patients with recorded adverse events within 30 days of surgery.

The adjusted OR for next-day discharge was .75 but did not reach statistical significance ($P = .08$, 95% CI [.55–1.04]). Preoperative dyspnea and a history of hypertension requiring medications were both found to be significant predictors for adverse events in patients discharged the next day (Table 3). A power analysis was also performed to determine the detectable effect size using an alpha set at .05 and a power of .80. The results showed that a 30% change would be needed to detect a significant difference across groups. Because the adverse event rate is already quite low in the study population, requiring a larger sample size to detect a smaller difference did not seem necessary from a clinical perspective.

Discussion

This study found that patients with uncomplicated procedures and hospital stays discharged the next day did not have a significantly higher rate of 30-day adverse events compared to patients discharged on POD 2. However, preoperative hypertension and dyspnea were found to be significant predictors of adverse events in patients discharged the next day.

There have been few previous studies addressing the safety and feasibility of next-day discharge after laparoscopic SG. A randomized clinical trial by Lemanu et al. [16] looked at the effect of an enhanced recovery protocol following laparoscopic SG and determined that it significantly reduced hospital stay and costs without compromising postoperative morbidity. Another study by Billing et al. [7] reviewed outcomes in 250 consecutive patients that received a laparoscopic SG at a single ambulatory surgical center. They concluded that outpatient laparoscopic SG operations could be performed safely in carefully selected patients. However, they also acknowledged that more