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Original article

Fast track bariatric surgery: safety of discharge on the first postoperative day after bariatric surgery

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Abstract

Background: Fast track recovery pathways have resulted in a multidisciplinary approach to enhance postoperative recovery.

Objectives: To assess feasibility and outcome of early discharge after laparoscopic sleeve gastrectomy (LSG) and laparoscopic Roux-en-Y gastric bypass (LRYGB).

Setting: The American College of Surgeons National Surgical Quality Improvement Program database was analyzed to identify patients with body mass index $\geq$35 kg/m^2 who underwent LSG or LRYGB in 2012 and 2013.

Methods: Patients were allocated to early discharge (ED) when discharged on postoperative (POD) 1 and late discharge (LD) when discharged on POD 2 or 3. Baseline characteristics and 30-day outcomes were compared between the 2 groups.

Results: Records of 15,468 LSG and 16,483 LRYGB patients were analyzed; 5220 patients with LSG (33.7%) and 2960 patients with LRYGB (18%) were discharged on POD 1. The early discharge group had significantly fewer co-morbidities and lower rate of complications and readmission. Thirty-day readmission rate in LSG was 2.8% in ED versus 3.6% in LD ($P = .008$), and in LRGYB, it was 4.3% in ED versus 5.8% in LD ($P = .001$). Based on multivariate analysis, early discharge was not an independent risk factor for a higher readmission rate after LSG or LRYGB. Predictors of late discharge were age $>$50 years, body mass index $>$50 kg/m^2, Hispanic or non-Hispanic black race/ethnicity, impaired functional status, diabetes on insulin, chronic steroid/immunosuppressant use, bleeding disorder, being on dialysis, chronic obstructive pulmonary disease, albumin $<$3.5 mg/dL, longer operative time, and concurrent cholecystectomy.

Conclusion: Discharge on POD 1 after LSG and LRYGB is feasible in a considerable proportion of patients. In this subgroup, early discharge is well tolerated and may be associated with lower complication and readmission rates. (Surg Obes Relat Dis 2016;∎:00–00.) © 2016 American Society for Metabolic and Bariatric Surgery. All rights reserved.

Keywords: Gastric bypass; Sleeve gastrectomy; Fast track; Enhanced recovery after surgery (ERAS); Early discharge; NSQIP

Despite efforts in prevention and treatment of obesity, endemic rates of obesity continue to surpass all predictions [1]. Laparoscopic Roux-en-Y gastric bypass (LRYGB) and laparoscopic sleeve gastrectomy (LSG) have been linked with acceptable weight loss, resolution of obesity-related co-morbidities, improvements in quality of life, and longevity [1–4].

In the past decade, surgeons have focused on developing better-tolerated, more effective, and cost-beneficial processes for surgical treatment of diseases. One such area is the fast track pathway, which aims to optimize perioperative

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recovery. Few studies have reported on the safety profile and feasibility of early hospital discharge after bariatric surgery especially after LRYGB [2,3,5,6]; however, in current practice, the majority of patients stay 2–3 days after stapling bariatric surgery. Cost analyses have highlighted early hospital discharge after bariatric surgery as a well-tolerated option to limit hospital expenses [2,7,8]. In addition, shorter hospital stay may lead to a reduction in overlooked indirect costs that are sustained by patients and their families (e.g., lost family working days). On the other hand, earlier discharge may lead to better mobilization and theoretically fewer pulmonary and thromboembolic complications, especially in morbidly obese patients.

The aim of this study was to evaluate 30-day outcomes of hospital discharge on postoperative day (POD) 1 after the 2 most commonly performed stapling bariatric procedures (LRYGB and LSG) compared with a later discharge using American College of Surgeon National Surgical Quality Improvement Program (ACS-NSQIP) database.

Patients and methods

Data source

The NSQIP database is a multicenter, prospectively collected database that is contributed to by participant academic and community hospitals. There were 374 and 435 participating sites in 2012 and 2013, respectively. The ACS-NSQIP collects information on >300 variables, including preoperative, intraoperative, and 30-day postoperative parameters for patients undergoing major surgical procedures [9]. The database was analyzed to identify adult severely obese patients who underwent LSG or LRYGB between January 2012 and December 2013.

Study cohort and inclusion and exclusion criteria

This data set was analyzed to identify morbidly obese patients age $\geq$18 years and with body mass index (BMI) $\geq$35 kg/m^2 who had undergone either LSG (Current Procedural Terminology [CPT] code 43775) or LRYGB (CPT code 43644). Patients who underwent concurrent procedures (e.g., abdominal wall hernia repair, cholecystectomy, and feeding tube placement) were included. The initial inclusion criteria identified 34,338 patients. We then excluded those with discharge recorded on POD 0 (N = 227) or POD 4 or later (N = 2160). A total of 31,951 patient cases were included in the current analysis.

Baseline, intraoperative, and postoperative variables

Demographic characteristics, preoperative factors, intraoperative variables, and 30-day postoperative outcomes were extracted for each patient. Demographic variables were age, sex, initial weight (kg), initial BMI, race, and ethnicity. We examined co-morbidities including diabetes mellitus (with oral agent or insulin), hypertension, chronic obstructive pulmonary disease (COPD), cardiac disease that needed intervention, chronic kidney disease on dialysis, history of cerebrovascular diseases (transient ischemic attack or stroke), chronic steroid or immunosuppressant use, and bleeding disorders. Other baseline variables included the American Society of Anesthesiologists score, functional health status (totally dependent, partially dependent, or independent), smoking status, and preoperative laboratory findings such as creatinine, albumin, hematocrit, bilirubin, and international normalized ratio. Definitions of co-morbid conditions are available at NSQIP official website [10]. Concurrent procedures were extracted using the respective CPT codes and consisted of feeding tube placement, cholecystectomy, removal of adjustable gastric band, bowel resection, lysis of adhesions, and abdominal wall hernia repair. Postoperative complication was defined as occurrence of any adverse events in the index admission. Adverse events included wound infection, organ/space surgical site infection, stroke, coma, myocardial infarction, cardiac arrest, acute kidney injury, deep vein thrombosis, pulmonary embolism (PE), pneumonia, reintubation, failure to wean (mechanical ventilation >48 hr), sepsis, septic shock, and need for transfusion. Reoperation in the index admission, total hospital length of stay (LOS), mortality, and discharge to a rehabilitation center, separate acute care setting, or nursing facility were also considered.

Stratification and endpoints

Patients were assigned to the early discharge (ED) group if discharged on POD 1 and late discharge (LD) group if discharged on POD 2 or 3. Thirty-day outcomes were compared between the 2 groups stratified by LSG or LRYGB. The main endpoints were (1) 30-day unplanned readmission, classified as inpatient stay to the same or another hospital within 30 days of the procedure; and (2) 30-day adverse events individually and also in aggregates, including "any complication" and "surgical site complication" ("superficial wound infection, deep surgical incision infection, organ specific infection, bleeding led to blood transfusion, and wound dehiscence").

Statistical analysis

Study parameters are expressed as mean ± SD and number (%). ED and LD groups were compared using χ^2 or Fisher's exact tests for categorical variables and Student's t test or Mann-Whitney U tests for continuous variables, as appropriate. Logistic regression models were fit to (1) examine the contribution of early discharge on unplanned 30-day readmission and (2) find the predictors of late discharge versus early discharge. The models included variables associated with $P < .1$ in univariate analyses, and adjustments were made in a backward stepwise elimination