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ORIGINAL CONTRIBUTIONS

Is Same-Day Discharge After Roux-en-Y Gastric Bypass Safe? A Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program Database Analysis

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Abstract

Purpose Same-day discharge (SDD) after bariatric surgery is gaining popularity. We aimed to analyze the safety of SDD after Roux-en-Y gastric bypass (RYGB) and compare its outcomes to inpatients discharged on postoperative days 1–2.

Materials and Methods We performed a retrospective analysis of the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program database for the period 2015–2020. Patients who underwent primary laparoscopic RYGB and were discharged the same day of the operation (SDD-RYGB) and inpatients discharged on postoperative days 1–2 (In-RYGB) were compared. Primary outcomes of interest were overall morbidity, serious morbidity, readmission, reoperation, intervention, and mortality rates.

Results A total of 167,188 patients were included; 2156 (1.3%) SDD-RYGB and 165,032 (98.7%) In-RYGB. Mean age (SDD-RYGB: 44.5 vs. In-RYGB: 44.6 years), proportion of females (SDD-RYGB: 81.4% vs. In-RYGB: 80.6%), and mean body mass index (SDD-RYGB: 45.8 vs. In-RYGB: 45.9 kg/m^2) were similar between groups. Overall morbidity (SDD-RYGB: 11.3% vs. In-RYGB: 10.2%; OR: 1.2, $p=0.08$), serious morbidity (SDD-RYGB: 3.1% vs. In-RYGB: 3%; OR: 1.03, $p=0.81$), reoperation (SDD-RYGB: 1.4% vs. In-RYGB: 1.2%; OR: 1.16, $p=0.42$), readmission (SDD-RYGB: 4.8% vs. In-RYGB: 4.8%; OR: 1.01, $p=0.89$), and mortality (SDD-RYGB: 0.04% vs. In-RYGB: 0.09%; OR: 0.53, $p=0.53$) were comparable between groups. SDD-RYGB had lower risk of 30-day interventions (SDD-RYGB: 1.1% vs. In-RYGB: 1.6%; OR: 0.64, $p=0.04$) compared to In-RYGB.

Conclusion Same-day discharge after RYGB seems to be safe and has comparable outcomes to admitted patients. Standardized patient selection criteria and perioperative management protocols are needed to further increase the safety of this practice.

Keywords Laparoscopic Roux-en-Y gastric bypass · Gastric bypass · Same-day discharge · Outpatient bariatric surgery · Ambulatory gastric bypass

Key points

- Same-day discharge was used in 1.2% of all the RYGB performed in MBSAQIP centers.
- SDD-RYGB had comparable morbidity, reoperation, intervention, and readmission when compared to In-RYGB.
- Outpatient dehydration treatment was one of the main causes of morbidity after RYGB.

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Introduction

Roux-en-Y gastric bypass (RYGB) is one of the two most performed bariatric procedures in the USA. According to the American Society for Metabolic and Bariatric Surgery (ASMBS), RYGB represented 17.8% of all the bariatric operations performed in 2019 [1]. RYGB has a high safety profile and has demonstrated to be effective in achieving significant weight loss and resolution of obesity-related comorbidities [2, 3].

A decade ago, most RYGB patients were hospitalized for 2 days [4]. However, with the widespread adoption of minimally invasive techniques and the application of Enhanced

Recovery After Surgery (ERAS) protocols, the postoperative outcomes of RYGB have improved and the length of hospitalization has progressively decreased [5–8]. Several articles have demonstrated that RYGB patients can be discharged on postoperative day (POD) 1 without increasing the postoperative morbidity or readmission rates [9–11]. More recently, same-day discharge (SDD) (also known as day-case surgery, ambulatory surgery, outpatient surgery, or same-day surgery) bariatric surgery has been attempted by many centers, mostly in the USA. It is unclear if SDD could provide any direct benefit to patients, but it might help to reduce costs and healthcare staff workload. Series of SDD adjustable gastric banding, laparoscopic sleeve gastrectomy, and RYGB have been reported with promising outcomes [4, 12–19]. Still, the ideal patient population and perioperative management for ambulatory bariatric surgery are not standardized.

Only three retrospective and one prospective study have analyzed the safety and feasibility of SDD-RYGB with conflicting results [4, 17–19]. The aim of this study was to analyze the safety of SDD-RYGB and compare its outcomes to the classic inpatient management.

Materials and Methods

Study Design and Population

The Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database was analyzed for patients between 18 and 70 years old, with a body mass index (BMI) ≥ 35 kg/m^2 who underwent elective RYGB between 2015 and 2020. The sample was divided into two groups according to the length of hospital stay (LOS): same-day discharge RYGB (SDD-RYGB) (LOS 0 days) and inpatient RYGB (In-RYGB) (LOS 1–2 days). Only conventional laparoscopic and primary RYGB procedures were included. To reduce confounding variables, robotic-assisted RYGB, patients with American Society of Anesthesiologists (ASA) class V or higher, previous bariatric surgery, length of stay ≥ 3 days, or those who were converted to another approach were excluded. Patients who died on postoperative day 0 were also excluded as it is not possible to determine if they were intended for SDD or In-RYGB.

The MBSAQIP participant use data file (PUF) prospectively collects data on several variables such as demographics, comorbidities, and 30-day postoperative outcomes. The definitions of each variable are available in the MBSAQIP manual [20]. In this study, patients were identified using the Current Procedural Terminology Code (CPT) for RYGB: 43,644. Overall morbidity was calculated as the number of patients who had at least one of the following postoperative events: acute renal failure, cardiac arrest, coma, cerebrovascular accident, superficial/deep incisional or organ space surgical site infection (SSI), myocardial infarction, postoperative ventilation, pneumonia, peripheral nerve injury, progressive renal insufficiency, pulmonary embolism, sepsis or septic shock, transfusion, unplanned intubation, urinary tract infection, vein thrombosis, wound disruption, unplanned intensive care unit admission, outpatient dehydration treatment, intervention, reoperation, or readmission. Serious morbidity comprised cardiac arrest, coma, cerebrovascular accident, organ space SSI, myocardial infarction, postoperative ventilation, progressive renal insufficiency, pulmonary embolism, septic shock, unplanned intubation, unplanned intensive care unit admission, intervention, and reoperation. Causes for mortality were also screened to check for missing morbidity information.

The American College of Surgeons Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program and the centers participating in the ACS MBSAQIP are the source of the data used herein; they have not verified and are not responsible for the statistical validity of the data analysis or the conclusions derived by the authors. For this type of study, an Institutional Review Board protocol was not required.

Outcome Measurement

The primary outcomes of interest were as follows: 30-day overall morbidity, serious morbidity readmission, reoperation, intervention, and mortality rates. Secondary outcome measures included operative time, outpatient dehydration treatment, and emergency department visits.

Statistical Analyses

The Student *t*-test was used to compare continuous variables, whereas the χ^2 test was used for categorical variables. Multivariate logistic regression was used to determine risk-adjusted outcomes for SDD-RYGB (reference) vs. In-RYGB. Variables adjusted were demographics or intraoperative characteristics which were significantly different between groups on univariate analysis. A p value < 0.05 was considered statistically significant for all tests. Statistical analysis was performed using Stata/SE 16.1 for Windows.

Results

During the study period, a total of 276,447 RYGB were performed in MBSAQIP centers: 3275 (1.2%) same-day discharge, 107,143 (38.7%) POD 1 discharge, 124,414 (45%) POD 2 discharge, and 41,615 (15.1%) POD ≥ 3 discharge. The proportion of patients undergoing same-day (2015: 0.9% vs. 2020: 2.2%, $p < 0.001$) and POD 1 discharge after RYGB

(2015: 25.9% vs. 2020: 52.4%, $p<0.001$) increased significantly during the study period. In contrast, the frequency of POD2 (2015: 53.4% vs. 2020: 34.4%, $p<0.001$) and POD ≥ 3 discharge RYGB (2015: 19.8% vs. 11%, $p<0.001$) decreased (Fig. 1).

After inclusion and exclusion criteria were applied, a total of 167,188 RYGB patients were analyzed, including 2156 SDD-RYGB and 165,032 In-RYGB.

Patient demographics and clinical characteristics are listed in Table 1. Mean age (SDD-RYGB: 44.5 vs. In-RYGB: 44.6, $p=0.84$), proportion of females (SDD-RYGB: 81.4% vs. In-RYGB: 80.6%, $p=0.37$), ASA classification, and preoperative BMI (SDD-RYGB: 45.8 vs. In-RYGB: 45.9 kg/m^2, $p=0.72$) were similar between the groups. The presence of gastroesophageal reflux disease (SDD-RYGB: 35.8% vs. In-RYGB: 38.2, $p=0.02$), venous stasis (SDD-RYGB: 0.4% vs. In-RYGB: 1%, $p=0.004$), and obstructive sleep apnea (OSA) (SDD-RYGB: 39.3% vs. In-RYGB: 43.5%, $p<0.001$) was more frequent in the In-RYGB group. Other evaluated comorbidities and preoperative characteristics were similar between the groups.

In the SDD-RYGB cohort, operative time was significantly shorter (SDD-RYGB: 106.8 vs. In-RYGB: 114.4 min, $p<0.001$) and the presence of a bariatric specialist more frequent (SDD-RYGB: 83.1% vs. In-RYGB: 80.7%, $p=0.002$). Conversely, intraoperative drain placement (SDD-RYGB: 17.4% vs. In-RYGB: 22.5%, $p<0.001$) and performance of a provocative test to check the anastomosis (SDD-RYGB: 91.6% vs. In-RYGB: 93.1%, $p=0.01$) were more frequent in the inpatient group (Table 2).

Postoperative outcomes are summarized in Table 3. On univariate analysis, 30-day overall morbidity (SDD-RYGB: 11.3% vs. In-RYGB: 10.2%, $p=0.08$), serious morbidity (SDD-RYGB: 3.1% vs. In-RYGB: 3%, $p=0.70$), reoperation (SDD-RYGB: 1.4% vs. In-RYGB: 1.2%, $p=0.54$), intervention (SDD-RYGB: 1.1% vs. In-RYGB: 1.6%, $p=0.12$), readmission (SDD-RYGB: 4.8% vs. In-RYGB: 4.8%, $p=0.97$), and mortality rates (SDD-RYGB: 0.04% vs. In-RYGB: 0.09%, $p=0.45$) were comparable between inpatient and same-day discharge patients. Outpatient dehydration treatment (SDD-RYGB: 5.3% vs. In-RYGB: 4%, $p=0.008$), blood transfusion (SDD-RYGB: 0.4% vs. In-RYGB: 0.2%, $p=0.02$), progressive renal insufficiency (SDD-RYGB: 0.2% vs. In-RYGB: 0.04%, $p=0.01$), and cerebrovascular accident (SDD-RYGB: 0.09% vs. In-RYGB: 0.008%, $p=0.01$) rates were higher after SDD-RYGB.

Multivariate logistic regression analysis also showed similar risk of overall morbidity (OR 1.2, 95% CI 0.98–1.29, $p=0.08$), serious morbidity (OR 1.03, 95% CI 0.80–1.32, $p=0.81$), reoperation (OR 1.16, 95% CI 0.80–1.66, $p=0.42$), readmission (OR 1.01, 95% CI 0.82–1.24, $p=0.89$), and mortality (OR 0.53, 95% CI 0.07–3.83, $p=0.53$) between SDD-RYGB and In-RYGB. However, a lower risk of 30-day intervention (OR 0.64, 95% CI 0.42–0.99, $p=0.04$) was found in same-day discharge patients (Table 4).

Discussion

This study aimed to analyze the safety of SDD-RYGB and compare its outcomes to inpatient RYGB (POD1 and 2 discharge). We found the following: (a) Most RYGB patients (83.7%) are discharged on POD 1 and 2; (b) The rate of same-day discharge after RYGB has at least duplicated in

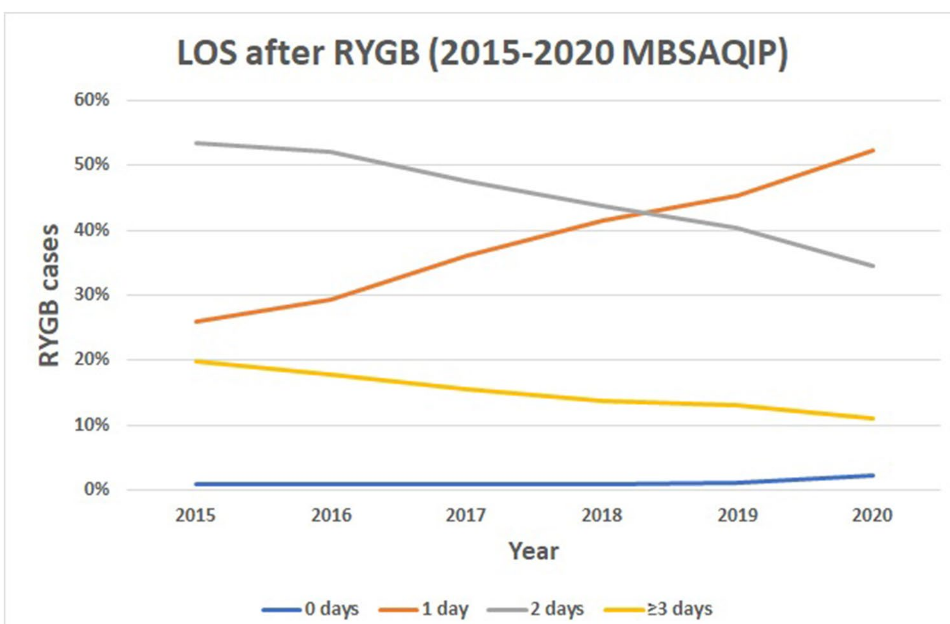

Fig. 1 Length of hospital stay (LOS) after Roux-en-Y gastric bypass (RYGB) between 2015 and 2020 in MBSAQIP centers

Table 1 Baseline characteristics of patients who underwent same-day discharge and inpatient RYGB

Baseline characteristics	Same-day discharge, $N=2156$	Inpatient, $N=165{,}032$	p value
Age, years, mean ± SD	44.5 ± 11.4	44.6 ± 11.5	0.84
Female, *n* (%)	1755 (81.4)	133,085 (80.6)	0.37
Race, *n* (%)			
African American	336 (15.6)	21,921 (13.3)	**0.002**
American Indian or Alaska native	16 (0.7)	950 (0.6)	0.31
Asian	12 (0.5)	949 (0.6)	0.90
Native Hawaiian or other Pacific islander	8 (0.4)	781(0.5)	0.49
White	1530 (71)	123,803 (75)	**< 0.001**
Unknown/other	254 (11.8)	16,628 (10.1)	**0.009**
Preoperative BMI, kg/m^2, mean ± SD	45.8 ± 7.6	45.9 ± 7.6	0.72
Highest BMI, kg/m^2, mean ± SD	47.8 ± 8.1	48.1 ± 8.1	0.07
ASA classification, *n* (%)			
ASA I	4 (0.2)	283 (0.2)	0.87
ASA II	338 (15.7)	26,781 (16.2)	0.49
ASA III	1732 (80.3)	131,225 (79.5)	0.34
ASA IV	82 (3.8)	6743 (4.1)	0.51
Comorbidities, *n* (%)			
GERD	773 (35.8)	63,152 (38.2)	**0.02**
History of myocardial infarction	31 (1.4)	2132 (1.3)	0.55
Previous PCI	31 (1.4)	3136 (1.9)	0.11
Previous cardiac surgery	18 (0.8)	1497 (0.9)	0.72
Hypertension	1078 (50)	82,916 (50.2)	0.82
Hyperlipidemia	586 (27.2)	45,109 (27.3)	0.87
History of pulmonary embolism	33 (1.5)	1944 (1.2)	0.13
History of deep vein thrombosis	37 (1.7)	2885 (1.7)	0.91
Venous stasis	9 (0.4)	1726 (1)	**0.004**
Preoperative anticoagulation	40 (1.8)	4143 (2.5)	0.05
Renal insufficiency	10 (0.5)	783 (0.5)	0.94
Dialysis	1 (0.04)	240 (0.1)	0.22
Diabetes mellitus	676 (31.3)	54,344 (32.9)	0.12
COPD	33 (1.5)	2451 (1.5)	0.86
Current smoker within 1 year	173 (8)	13,090 (7.9)	0.87
Preoperative functional health status			
Independent	2145 (99.5)	163,943 (99.3)	0.39
Partially dependent	8 (0.4)	802 (0.5)	0.44
Totally dependent	3 (0.1)	217 (0.1)	0.92
Ambulation limited	23 (1.1)	2051 (1.2)	0.46
OSA	847 (39.3)	71,850 (43.5)	**< 0.001**
Preoperative steroids use	25 (1.1)	2649 (1.6)	0.10
Previous organ transplant	1 (0.04)	43 (0.02)	0.45
Previous surgery	43 (2)	2518 (1.5)	0.07
Preoperative IVC filter	8 (0.4)	749 (0.4)	0.56

Abbreviations: *ASA*, American Society of Anesthesiologists; *BMI*, body mass index; *GERD*, gastroesophageal reflux disease; *PCI*, percutaneous coronary intervention; *COPD*, chronic obstructive pulmonary disease; *OSA*, obstructive sleep apnea; *IVC*, inferior vena cava. p values < 0.05 are denoted in bold

the last 7 years; (c) SDD-RYGB has similar morbidity, reoperation, readmission, and mortality rates when compared to inpatient RYGB.

Thanks to refinements in the operative technique, the application of minimally invasive approaches, fast track protocols, and enhanced perioperative management,

Table 2 Operative characteristics of patients who underwent same-day discharge and inpatient RYGB

Operative characteristic	Same-day discharge, $N = 2156$	Inpatient, $N = 165{,}032$	p value
Intraoperative drain placed, n (%)	375 (17.4)	37,206 (22.5)	**< 0.001**
Operative time, min, mean ± SD	106.8 ± 51.5	114.4 ± 49.9	**< 0.001**
Concurrent procedure, n (%)	23 (1.1)	1614 (1)	0.67
Specialty of the physician, n (%)			
Bariatric surgeon	1797 (83.1)	133,231 (80.7)	**0.002**
Gastroenterologist	0 (0)	4 (0)	1
General surgeon	56 (2.6)	5304 (3.2)	0.10
Interventional radiologist	0 (0)	9 (0)	1
Other/not reported	303 (14)	26,484 (16)	**0.01**
Swallow study performed*, n (%)	331 (22)	32,165 (23)	0.35
Anastomosis checked with provocative test#, n (%)	1942 (91.6)	151,955 (93.1)	**0.01**

p values < 0.05 are denoted in bold. *Variable reported in 139,959 inpatients discharge and 1507 same-day discharge patients. #Variable reported in 163,287 inpatients and 2119 same-day discharge patients

bariatric surgery outcomes have improved, and the LOS has progressively shortened. Currently, most bariatric centers (83.7%) are discharging RYGB patients on POD 1 or 2. This reduction in the length of hospitalization did not seem to impact negatively on the patients' outcomes [9–11]. For instance, a propensity score–matched analysis of 17,724 laparoscopic RYGB patients found similar serious morbidity (POD 1: 0.4% vs. POD 2: 0.5%), reoperation (POD 1: 1.2% vs. POD2: 1.3%), and readmission rates (POD 1: 4.5% vs. POD: 4.9%) between RYGB patients discharged on POD 1 and 2. However, higher overall morbidity (POD 1: 6.1% vs. POD 2: 7.5%, $p < 0.001$) and intervention rates (POD 1: 1.5% vs. POD 2: 2.1%, $p = 0.004$) were found in patients discharged on day 2 [10]. A similar analysis of 37,132 RYGB patients from the American College of Surgeons National Surgery Quality Improvement Program database found similar risk of overall complications (OR 0.98, CI 0.81–1.19), major complications (OR 0.81, CI 0.58–1.12), and reoperations (OR 1.06, CI 0.79–1.41) between patients discharged on POD 1 and POD 2 [9].

More recently, several centers started to perform major bariatric operations (RYGB and sleeve gastrectomy (SG)) on a day-case/ambulatory basis with encouraging outcomes [14–19]. Same-day discharge might reduce costs and nosocomial infections, and improve patients' satisfaction [21, 22]. On this matter, a recent case-matched study compared the cost of SG performed as a day-case surgery or as an inpatient procedure. The authors reported that the overall cost per patient was reduced from 36 to 42% in day-case SG compared with inpatient SG [22]. Moreover, same-day discharge might increase access to bariatric surgery by saving precious resources and augment the healthcare system capacity to treat other illnesses. The latter has become particularly relevant in the COVID-19 pandemic.

A couple of single-center series reported that SDD-RYGG is safe and feasible in selected patients [17, 19]. For instance, Leepalao et al. performed a retrospective analysis of 362 patients who underwent SDD-RYGB and found no mortalities, 98.1% SDD success, 3.6% readmission, 2.5% complication, and 2.5% reoperation rates [17]. Similarly, a recent prospective study by Nijland et al. reported 88% SDD success rate, 4% of readmissions and complications (not related to SDD), no mortalities, and high patient's satisfaction scores. Interestingly, the patients were discharged home with a medical device to monitor vital signs and had video consultations with the physician twice a day for the first 2 postoperative days [19]. We found similar readmission (4.8%), reoperation (1.4%), and mortality (0.04%) rates to those reported by Nijland and Leepalao.

Two national database analyses suggested that SDD-RYGB was associated with higher adverse events when compared to the classic inpatient management [4, 18]. The bariatric outcomes longitudinal database (BOLD) analysis by Morton et al. found similar risk of serious complications (OR: 1.9, $p = 0.16$) and readmissions (OR: 0.7, $p = 0.22$) between SDD-RYGB and POD2 discharge RYGB. However, an increased risk of 30-day mortality (OR 13.02, $p < 0.001$) was reported in the SDD group [4]. Similarly, the 2015 MBSAQIP database study by Inaba et al. analyzed 9721 RYGB patients. When compared to POD1 discharge, SDD-RYGB had higher mortality (SDD-RYGB: 0.9% vs. POD1 RYGB: 0.05%, $p = 0.001$) and overall morbidity (SDD-RYGB: 3.7% vs. POD1: 1.5%, $p = 0.005$) but similar readmission (SDD-RYGB: 3.4% vs. POD1: 3.7%, $p = 0.7$), and reoperation rates (SDD-RYGB: 1.9% vs. POD1: 0.9%, $p = 0.12$) [18]. Conversely, we found similar overall morbidity (11.3% vs. 10.2%), serious morbidity (3.1% vs. 3%), readmission (4.8% vs. 4.8%), reoperation (1.4% vs. 1.2%), and mortality rates (0.04% vs.

Table 3 Postoperative outcomes of patients who underwent same-day discharge and inpatient RYGB

Variables	Same-day discharge, $N=2156$	Inpatient, $N=165{,}032$	p value
Blood transfusion, *n* (%)	8 (0.4)	280 (0.2)	**0.02**
Intra/postoperative myocardial infarction, *n* (%)	0 (0)	34 (0.02)	1
Acute renal failure, *n* (%)	1 (0.04)	75 (0.04)	0.98
Progressive renal insufficiency, *n* (%)	4 (0.2)	64 (0.04)	**0.01**
Cerebrovascular accident, *n* (%)	2 (0.09)	14 (0.008)	**0.01**
Superficial SSI, *n* (%)	18 (0.8)	1247 (0.7)	0.67
Deep incisional SSI, *n* (%)	2 (0.09)	178 (0.1)	0.83
Organ/space SSI, *n* (%)	2 (0.09)	376 (0.2)	0.19
Pneumonia, *n* (%)	1 (0.04)	268 (0.2)	0.18
Sepsis, *n* (%)	2 (0.09)	163 (0.09)	1
Septic shock, *n* (%)	1 (0.04)	87 (0.05)	1
ICU admission, *n* (%)	13 (0.6)	584 (0.3)	0.06
DVT, *n* (%)	2 (0.09)	213 (0.1)	0.64
Pulmonary embolism, *n* (%)	6 (0.3)	214 (0.1)	0.06
Emergency department visit, *n* (%*)	175 (8.1)	12,684 (7.7)	0.66
Dehydration treatment, *n* (%*)	114 (5.3)	6669 (4)	**0.008**
30-day overall morbidity, *n* (%)	243 (11.3)	16,752 (10.2)	0.08
30-day serious morbidity, *n* (%)	67 (3.1)	4895 (3)	0.70
30-day readmission, *n* (%)	103 (4.8)	7863 (4.8)	0.97
30-day intervention, *n* (%)	25 (1.1)	2593 (1.6)	0.12
30-day reoperation, *n* (%)	30 (1.4)	2057 (1.2)	0.54
30-day mortality, *n* (%)	1 (0.04)	160 (0.09)	0.45
Other/not listed	0	97	
Pulmonary embolism	0	28	
Other respiratory failure	1	9	
Anastomotic/staple line leak	0	6	
Bleeding	0	5	
Abdominal sepsis	0	5	
Intestinal obstruction	0	4	
Cardiovascular disease	0	3	
Gastrointestinal perforation	0	3	

Abbreviations. *SSI*, surgical site infection; *ICU*, intensive care unit; *DVT*, deep vein thrombosis. *Variable reported in 138,554 inpatients discharge and 1853 same-day discharge patients. p values <0.05 are denoted in bold

0.09%) between SDD and inpatients discharged on POD 1–2. Interestingly, our analysis showed higher morbidity rates (for both the SDD and inpatient RYGB groups) than those reported by Inaba. We believe this difference is related to the inclusion of additional variables (readmissions, reoperations, interventions, outpatient dehydration treatment, among others) in the overall morbidity recount. In contrast to our findings, Inaba reported higher mortality in the SDD-RYGB cohort (3 patients vs. 5 patients) [18]. However, the three mortalities in the SDD-RYGB group passed on postoperative day 0 (without being readmitted). Therefore, it is impossible to know if those cases were intended for SDD or were inpatients who died on the day of the operation and wrongly categorized as same-day discharge patients.

Table 4 Risk-adjusted outcomes for same-day discharge (reference) versus inpatient RYGB

Variable	OR	95% CI	p value
30-day overall morbidity	1.12	0.98–1.29	0.08
30-day serious morbidity	1.03	0.80–1.32	0.81
30-day readmission	1.01	0.82–1.24	0.89
30-day intervention	0.64	0.42–0.99	**0.04**
30-day reoperation	1.16	0.80–1.66	0.42
30-day mortality	0.53	0.07–3.83	0.53

p values <0.05 are denoted in bold

In our MBSAQIP analysis, we found some differences in the demographics and operative variables between the SDD-RYGB and In-RYGB groups. Patients with GERD (and likely concomitant hiatal hernia repair), venous stasis, and OSA were more likely to undergo In-RYGB. Drain placement and anastomotic leak test were more frequent, and operative time was longer among In-RYGB. These differences suggest that probably more difficult cases and/or higher risk patients were less likely to undergo SDD-RYGB. Moreover, we found that bariatric specialists were more likely to attempt SDD-RYGB.

We found that one of the main causes for postoperative morbidity after SDD-RYGB was dehydration (SDD-RYGB: 5.3% vs. In-RYGB: 4%, $p = 0.008$). Postoperative nausea has been reported as one of the most frequent causes for early readmission following bariatric surgery [23]. Delayed management of early postoperative complications is one of the main concerns for same-day discharge after bariatric surgery. Interestingly, we have found higher transfusion requirements (SDD-RYGB: 0.4% vs. In-RYGB: 0.2%), dehydration treatments (SDD-RYGB: 5.3% vs. In-RYGB: 4%), and progressive renal insufficiency rates (SDD-RYGB: 0.2% vs. In-RYGB: 0.04%) in patients discharged on the same day of the operation. This could be potentially related with a delay in the management of postoperative bleeding and oral intolerance. Aggressive treatment of postoperative nausea/vomiting, standardized anesthesia and perioperative management protocols, and education on the importance of early consultation are needed to increase the safety of SDD-RYGB. Pre- and/or post-discharge exhaustive intravenous hydration and remote monitoring of vital signs have been advocated by some authors to address this issue [19, 24]. Interestingly, a prospective study found that readmissions were reduced by 45% in bariatric patients receiving intravenous fluids after discharge [24]. Previous series on ambulatory bariatric surgery have used patient's age (18–65 years), BMI (< 50–60), absence of significant medical comorbidities, and ASA class (among others) to select SDD patients [17, 19]. Further investigation is required to identify the ideal population for SDD after bariatric surgery. Economic implications and financial interests behind the promotion of SDD should also be considered when analyzing the literature.

This study shares the limitations of any national dataset analysis (possible bias from inaccurately recorded or missing data). One of the main limitations is the retrospective nature of the study which is subject to a high risk of selection bias. The total number of patients intended for same-day discharge cannot be calculated and the type of center (ambulatory center vs. hospital) performing the procedures cannot be identified. In addition, selection criteria for same-day discharge, information about the anesthesia protocol, operative technique, and perioperative care are unknown. At last, the MBSAQIP database collects information from accredited bariatric centers, and their outcomes may not be representative of other non-MBSAQIP institutions.

Conclusion

Same-day discharge RYGB seems to be safe and has comparable outcomes to inpatients discharged on postoperative days 1–2. Since the frequency of this practice is increasing, standardized patient selection criteria and perioperative management protocols are needed. Potential delay in the diagnosis and management of postoperative complications after same-day discharge RYGB warrants further investigation and preventive measures.

Declarations

Ethics Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Consent to Participate For this type of study, formal consent is not required.

Conflict of Interest Dreifuss NH, Vanetta C, Schlottmann F, Cubisino A, Mangano A, Baz C, Gangemi A, Hassan C, and Masrur MA have no conflicts of interest or financial ties to disclose. Bianco FM has an educational agreement with Intuitive Surgical.

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