SCIENTIFIC PAPER

Outpatient Weight Loss Surgery: Initiating a Gastric Bypass and Gastric Banding Ambulatory Weight Loss Surgery Center

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ABSTRACT

Background: Ambulatory surgery or outpatient surgery is becoming increasingly common. In 2002, 63% of all operations performed in the United States were ambulatory procedures. Bariatric procedures performed in the United States have increased from 16,200 in 1992 to approximately 205,000 in 2007. In 2002, our center began offering laparoscopic Roux-en-Y gastric bypass (LRYGB) procedures on an outpatient basis for select candidates at an ambulatory surgery center (ASC). We subsequently added laparoscopic adjustable gastric band procedures (LAGB) in 2005.

Methods: Between 2002 and 2008, 248 LRYGB and LAGB patients were carefully selected for ASC surgery by the bariatric surgeon and medical director. Extensive preoperative education was mandatory for all surgical candidates.

Results: Since 2002, we have performed 248 bariatric cases at the ASC, including 38 LRYGB and 210 LAGB procedures. In this overall experience, 5 patients (2%) required readmission within 30 days of surgery, and 98.6% of LAGB patients were discharged the same day; 62% were discharged after a 4-hour to 6-hour stay in the ASC. All LRYGB patients remained in the ASC overnight and were discharge within 24 hours of their procedure. Weight loss results have been excellent.

Conclusion: LAGB surgery can be safely performed in an ASC setting in most patients. LRYGB can be performed safely in the ASC setting with careful scrutiny and cautious selection of patient candidates.

Key Words: Laparoscopic adjustable gastric banding (LAGB), Laparoscopic Roux-en-Y gastric bypass (LRYGB), Ambulatory surgery, Outpatient surgery, Morbid obesity.

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INTRODUCTION

Bariatric procedures performed in the United States have increased from 16,200 in 1992 to approximately 205,000 in 2007.[1] Recent studies confirm the resolution of diabetes and the gains in longevity that patients enjoy after bariatric surgery.[2–4] Increasingly, bariatric surgery is performed on an outpatient basis.[5] The dominant weight loss procedure performed on an outpatient basis is the laparoscopic adjustable gastric band (LAGB) procedure.[6,7] In 2002, our center began offering laparoscopic Roux-en-Y gastric bypass (LRYGB) procedures on an outpatient basis for highly selected candidates at an ambulatory surgery center (ASC). We defined "outpatient" as involving a total stay at the ASC of <24 hours. We subsequently have added LAGB procedures at the ASC. We present our experience with these procedures here.

Outpatient surgery has grown dramatically over the past decade.[5] In 2002, 63% of all operations performed in the United States were ambulatory procedures.[5] According to Russo et al[5] in 2007, outpatient surgery volume has increased over the years because of 2 factors: (a) "Advances in surgical technology and anesthesia have made surgery easier on patients and increased the demand for outpatient care," and (b) "health care policies have created economic incentives that encourage ambulatory surgery." While the terms "outpatient" and "ambulatory" are synonymous, there is no uniform definition nationwide. While recognizing that regulations in some jurisdictions allow 2 and 3 night "outpatient" stays, we define "outpatient" here as involving a stay at the ASC of <24 hours. Medicare and Medicaid define outpatient as "a patient of an organized medical facility, or distinct part of that facility who is expected by the facility to receive and who does receive professional services for less than a 24-hour period regardless of the hour of admission, whether or not a bed is used, or whether or not the patient remains in the facility past midnight."[8]

An appreciation of the feasibility and safety of outpatient surgery has grown. Other authors[9–12] have described the safety and feasibility of outpatient LAGB and LRYGB. Patients often prefer the comforts and atmosphere of the ASC setting over those of a hospital. Pressure from payors and self-pay patients has further led to consideration of

moving more surgical cases from the inpatient to the outpatient setting.[5]

In reviewing our inpatient experience with LRYGB surgery, we recognized that a significant number of patients were staying in the hospital overnight and being discharged home in a time period that would conform to the typical outpatient, or ASC, setting. We implemented a program to establish criteria that ensured the safety of our patients, and allowed them to undergo LRYGB, and subsequently LAGB surgery at an ASC. A protocol that allowed rapid transport to the inpatient facility in case of complications was initiated. A clinical pathway for outpatient LRYGB and LAGB care was instituted. The pathway called for same day discharge of nearly all patients undergoing LAGB and called for a 23-hour overnight stay for all patients undergoing LRYGB.

METHODS

Between 2002 and 2008, data were collected prospectively on 248 bariatric patients from the Western Bariatric Institute. Patients were offered LRYGB and LAGB in the ASC if criteria depicted in **Table 1** were satisfied. Approval by the bariatric surgeon and attending anesthesiologist required personally interviewing the patient, performing a physical examination, and reviewing the patient's records. Approval by the ASC director required reviewing the records submitted to schedule the procedure.

The ASC director reviews records, represents the ASC, and must account for any adverse events or transfer of the ASC. Preoperative cardiopulmonary evaluation is performed in accordance with criteria established by the American Society of Anesthesia.

A total of 38 highly selected patients had LRYGB at an outpatient ASC. These patients represent less than 3% of the total number of patients from our practice undergoing LRYGB surgery during that time frame. Characteristics of the ASC patients compared with the standard, or inpatient bariatric population at our center, are depicted in **Tables 2 and 3**.

Each patient remained in the ASC overnight. Patients were discharged when ambulating and tolerating oral liquids. Since the inception of the outpatient LAGB program in 2005, 210 patients have undergone LAGB surgery at the ASC. Seven patients had a body mass index (BMI) >60. Each patient completed the full preoperative program at our center, including psychological and nutritional evaluations, preoperative counseling and teaching courses, and support group attendance. Each patient is followed on a long-term basis at our center.

Table 1.
Criteria for Selection of Patients for Laparoscopic Roux-en-Y Gastric Bypass and Laparoscopic Adjustable Gastric Band Surgery

Approved for ambulatory surgery center by the bariatric surgeon and anesthesiologist
Approved by the ambulatory surgery center medical director (an anesthesiologist)
No history of pulmonary hypertension
Anesthesia risk factor classification of ASA III or less.
No history of sleep apnea, or sleep apnea well-controlled with home continuous positive airway pressure (CPAP)

RESULTS

Preoperative mean BMI in the LRYGB patient sample averaged 44.71 kg/m^2 (±SD 7.19; range, 33.0 to 66.3). Preoperative mean BMI among the LAGB patients was 43.79 kg/m^2 (±SD 6.41; range, 33.5 to 66.3). Mean excess body weight loss percent (EBWL%) in the LRYGB and LAGB after 12 months averaged 69.62% and 32.58% respectively. Mean operating (OR) time was 112.80 minutes for LRYGB surgery and 72.10 minutes for LAGB surgery **(Table 4)**. Mean length of stay was 22 hours 45 minutes for LRYGB and 7 hours 18 minutes for LAGB.

No patient required emergency hospital transfer or ICU admission. No significant surgical or anesthetic complications occurred. One LRYGB patient developed a bowel obstruction related to omental adhesions from prior pelvic surgery on postoperative day 5 and returned to the hospital. The patient underwent exploratory laparotomy and adhesiolysis and recovered after a prolonged ileus. One patient experienced port infection and required removal of the port and band. Three patients experienced obstruction of the gastric pouch outlet (band too tight) after LAGB during our early experience with LAGB surgery, predominantly with the 9.75-cm LAP-BAND. Since September of 2006, one such complication (gastric pouch outlet obstruction/band too tight) has occurred. The complete list of all complications and adverse events within 30 days is depicted in **Table 5**. All of the complications occurred in patients with a BMI of ≤53.

Eighty percent of LAGB and 75% of LRYGB patients have completed their 12-month follow-up at our center as

Table 2.
Comparison of the Mean Clinical Outcomes, Demographics, and Significance of Laparoscopic Adjustable Gastric Band Patients

LAGB	Age (yrs)	Female (%)	BMI (kg/m^2)	EBWL% (12 mo postop)	Total O.R Time (min)	Surgery Time (min)	Length of Stay (hr)
Outpatient (n = 210)							
Mean	45.57	81.90	43.79	32.58	72.10	65.91	7 hr 18 min
SD	11.18	*	6.41	24.22	28.83	27.58	4 hr 25 min
Inpatient (n = 687)							
Mean	48.59	80.64	45.35	35.06	70.33	63.28	27 hr 8 min
SD	12.67	*	7.39	23.11	31.43	25.58	9 hr 26 min
Significance							
P-Value	0.27	0.34	0.007	0.30	0.25	0.22	0.00

Table 3.
Comparison of the Mean Clinical Outcomes, Demographics, and Significance of Laparoscopic Roux-en-Y Gastric Bypass

LRYGB	Age (yrs)	Female (%)	BMI (kg/m^2)	EBWL% (12 mo postop)	Total O.R Time (min)	Surgery Time (min)	Length of Stay (hr)
Outpatient (n = 38)							
Mean	46.45	89.47	44.71	69.62	112.80	99.41	22 hr 45 min
SD	9.60	*	7.19	10.10	38.71	38.89	1 hr 8 min
Inpatient (n = 1419)							
Mean	47.33	84.00	47.52	67.28	119.40	88.37	56 hr 59 min
SD	10.45	*	8.48	19.97	39.03	34.18	37 hr 26 min
Significance							
P-Value	0.27	0.06	0.11	0.09	0.58	0.20	0.00

Table 4.
Outpatient: Demographics and Clinical Outcomes of Laparoscopic Roux-en-Y Gastric Bypass and Laparoscopic Adjustable Gastric Band

	LRYGB	LAGB
No. of Patients	38	210
Female/Male	34/4	172/38
Mean Age	46.45 (±SD 9.60; range, 21 to 70)	45.57 (±SD 11.19; range 23 to 70)
Mean Total OR Time (min)	112.80 (±SD 38.71; range 80 to 179)	72.10 (±SD 28.83; range 27 to 167)
Mean Length of Stay	22 hr 45 min (±SD 1 hr 8 min; range, 21 hr 7 min to 24 hr)	7 hr 18 min (±SD 4 hr 25 min; range, 3 hr to 24 hr 3 min)
≤30 Day Complication Rate	2.6%	1.9%
≤30 Day Mortality Rate	0	0

Table 5.
Outpatient: Complications <30 Days

Patient No.	Date of Surgery	No. of Days (Postop) at Time of Complication	Complication	Date of Admission	No. of Days Admitted	Initial BMI (kg/m^2)	LRYGB/LABG*
61	05/19/06	15 days	Infection of port and band	06/03/06	2 days	44.3	LAGB
80	09/05/06	1 day	Obstruction of the gastric pouch outlet	09/06/06	3 days	42	LAGB
81	09/06/06	1 day	Obstruction of the gastric pouch outlet	09/07/06	5 days	53	LAGB
122	01/02/07	1 days	Obstruction of the gastric pouch outlet	01/02/07	2 days	42	LAGB
178	07/06/07	5 days	Small bowel obstruction	07/11/07	17 days	49	LRYGB

*LRYGB = Laparoscopic Roux-en-Y Gastric Bypass; LAGB = Laparoscopic Adjustable Gastric Band.

Table 6.
Outpatient Percent Follow-up Laparoscopic Adjustable Gastric Band Patients

Visits (months) LAGB	N (Follow-up)	N (Missed follow-up)	Percent (%) Follow-up
1	210	1	99.52
3	195	3	98.46
6	177	19	89.27
9	160	37	76.88
12	137	27	80.29

Table 7.
Outpatient Percent Follow-up Laparoscopic Roux-en-Y Gastric Bypass Patients

Visits (month) LRYGB	N (Follow-up due)	N (Missed follow-up)	Percent (%) Follow-up
1	38	2	94.74
3	37	6	83.78
6	30	7	76.67
9	23	5	78.26
12	20	5	75.00

shown in **Tables 6 and 7**. Their weight loss, reported as BMI and EBWL%, results to date are depicted in **Figures 1 and 2**.

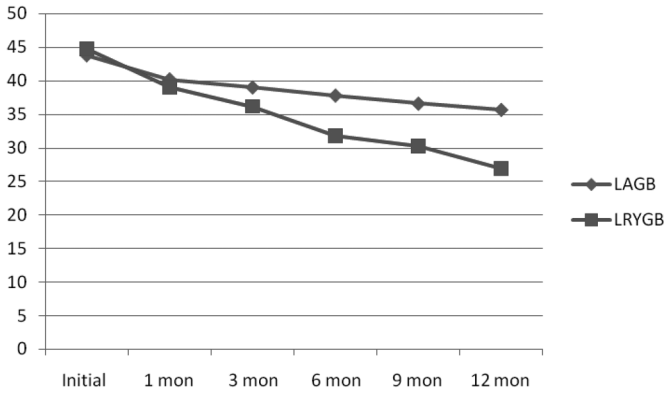

Figure 1. Mean BMI (kg/m^2) of LAGB and LRYGB outpatients from initial BMI to postop 12 months.

DISCUSSION

In our experience, LRYGB and LAGB can be safely performed in an ASC setting in carefully selected patients. Our belief is that with an experienced team, extensive education and system safeguards, patients can receive the highest quality care and enjoy the advantages of the ASC environment. Our current center is located 100 yards from a major regional medical center, and patients can be transported rapidly if an urgent need arises.

Since 2002, we have performed 248 bariatric procedures at the ASC. In this overall experience, 2% of patients were admitted to a hospital within 30 days of surgery, owing, in part, to our early experience with the 9.75-cm LAP-BAND and the occurrence of gastric pouch outlet obstruction in the immediate postoperative period. Since September

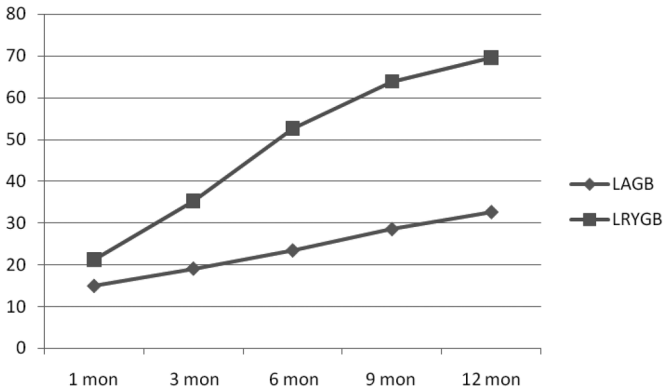

Figure 2. Mean excess body weight loss percent (EBWL%) of LRYGB and LAGB outpatients from postop 1 month to postop 12 months.

2006, we have experienced one case of gastric pouch outlet obstruction. Our center also has recently changed to both the new LAP-BAND AP (Advanced Performance, Allergan, Irvine, CA) System, and the REALIZE band (Ethicon Endosurgery, Cincinnati, OH) with expectations of further reducing the incidence of this complication.[13] Of LAGB patients, 98.6% have been discharged the same day, most commonly after a 4-hour to 6-hour stay in the ASC. With the diminution of the gastric pouch outlet obstruction problem, we observe virtually all patients going home the same day after LAGB surgery. All LRYGB patients have remained in the ASC overnight and have been discharged home within the 23-hour time frame. While some surgeons limit outpatient LAGB to patients with BMI<50, we have not found BMI to be as important a criterion for outpatient candidacy.[12]

CONCLUSION

The increased demand for bariatric surgery will undoubtedly continue, as the obesity epidemic expands and the success of minimally invasive weight loss surgery continues to be widely experienced and publicized. Patient, insurer, and surgeon demands will lead to a greater share of these procedures being performed in an outpatient setting. LAGB is clearly suited to this setting, but LRYGB will require careful scrutiny and cautious selection of patient candidates.

The most frequent complication in our outpatient LAGB patients stemmed from the band being too tight and causing an obstruction of the gastric pouch outlet with the 9.75-cm LAP-BAND. This problem has been alleviated with the use of the newer AP band system. In the outpatient setting, it makes sense to consider this potential complication carefully and perhaps more liberally use the AP-Large band when the band size choice is in doubt.

Currently, Center of Excellence (COE) guidelines for outpatient surgery centers emphasize a volume of surgical cases performed at the center of 125 per year.[14,15] This reported experience supports the practice of safe, high-quality outpatient bariatric patient care with numbers below this level. The fact that each surgeon in this study is part of a COE at the adjacent hospital may have some bearing and may invite consideration for another method of accrediting outpatient surgery centers in similar situations.

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