



Original article

## Early small bowel obstruction after laparoscopic gastric bypass: a surgical emergency

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### Abstract

**Background:** Early small bowel obstruction (ESBO; within 30 d of surgery) after laparoscopic gastric bypass (LRYGB) is reported in .5% to 5.2% of primary cases, but it is associated with significant morbidity, and the treatment is not standardized.

**Objectives:** To review prevalence, causes, management, and outcomes of patients treated for ESBO after LRYGB.

**Setting:** Tertiary academic medical center.

**Methods:** Retrospective review to identify consecutive patients who underwent primary LRYGB and those who developed ESBO from January 2000 through June 2017. Data included demographic characteristics, co-morbidities, LRYGB technical details, and ESBO clinical presentation, location, causes, treatment, and outcomes.

**Results:** One thousand seven hundred seventeen patients (84.2% females) had LRYGB. Mean age and body mass index was  $42.4 \pm 11.1$  years and  $48.2 \pm 7.3$  kg/m<sup>2</sup>, respectively. Twenty-nine patients (1.7%) had ESBO. All patients presented with symptoms, most commonly nausea and vomiting (n=17), on average  $4.1 \pm 5.9$  days postoperatively; most required reoperation (n=23, 79.3%) and 5 required >1 reoperation. Location of the obstruction and treatment used were the following: (1) jejuno-jejunostomy (n=17, 58.6%; narrowing or clot), treated with reoperation in 11; and (2) other than at the jejuno-jejunostomy (n=12, 41.4%; trocar site, incisional or internal hernia, adhesions, mesenteric ischemia), treated with reoperation in all. All ESBO patients had additional complications, 6 (20.1%) developed an anastomotic leak, and 2 (6.9%) died.

**Conclusion:** ESBO infrequently occurs after LRYGB; many causes are technique related and possibly preventable. However, it is associated with significant morbidity and mortality. A high index of clinical suspicion, rapid and appropriate imaging, and prompt operative intervention are recommended. (Surg Obes Relat Dis 2018;000:1–8.) © 2018 American Society for Bariatric Surgery. Published by Elsevier Inc. All rights reserved.

### Keywords:

Small bowel obstruction; Laparoscopic Roux-en-Y gastric bypass; Gastric bypass; Complications; Internal hernia; jejunojejunostomy

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Roux-en-Y gastric bypass (RYGB) is currently the second most commonly performed bariatric surgery in the United States. In 2016, the American Society for Metabolic and Bariatric Surgery estimated that 40,392 RYGBs were performed in the United States [1]. While laparoscopic RYGB (LRYGB) has an excellent safety profile with a perioperative complication rate comparable to cholecystectomy and appendectomy and a mortality rate similar to total knee arthroplasty [2], it is still associated with a low but relentless rate of serious complications [3,4]. Failure to recognize and expeditiously manage and rescue patients from these complications may lead to significant additional morbidity and mortality [5,6].

Early small bowel obstruction (ESBO; up to 30 d after surgery) is a relatively uncommon complication after LRYGB. Reported rates of ESBO are from .5% to 5.2% and all were associated with significant additional morbidity [7–12]. Of interest, the clinical presentation, etiology, diagnostic, and therapeutic strategies for ESBO are not well defined. Our aim was to review the clinical presentation, causes, management, and outcomes of all patients treated for ESBO after LRYGB at a large tertiary academic medical center in the United States.

## Methods

This is an institutional review board–approved review of all consecutive patients who underwent LRYGB from January 2000 through June 2017 at our institution. All patients included in this study had a primary LRYGB. Patients with revisional surgeries or conversions from other bariatric procedures to LRYGB were excluded. Data in the Bariatric Surgery Clinical Database were collected prospectively, verified retrospectively, and then entered into a customized computer database. We queried our database to identify patients diagnosed with small bowel obstruction within the 30-day postoperative period. In addition to the database, both paper and electronic charts of all patients were again reviewed in detail.

Patient demographic and clinical characteristics collected, included age (in yr), sex, race (patient-reported through a standard intake questionnaire with separate questions for race and ethnicity), weight (in kg), body mass index (BMI; weight in kg/height squared in meters), and the presence of obesity-related co-morbidities, such as type-2 diabetes, hypertension, hyperlipidemia, obstructive sleep apnea, and gastroesophageal reflux disease. Reviewing all available notes from the bariatric surgeons and referring physician, the preoperative anesthesiology evaluation, in addition to reviewing patient's medications identified these diseases. Total length of stay (defined as the total number of days the patient was in the hospital after LRYGB, including days of readmission for the ESBO patients) and alimentary limb route (retrocolic versus antecolic) were also collected. Clinical presentation of

ESBO included symptoms, time from LRYGB to onset of symptoms, and time from diagnosis to treatment. The time of diagnosis was defined as the time between the index procedure and the imaging studies confirming the diagnosis of ESBO. In addition, we noted locations and causes of ESBO, type of diagnostic imaging used, type of treatment (operative versus conservative), details of treatment, and additional morbidity and mortality.

The severity of complications was categorized using the Clavien-Dindo classification of surgical complications [13] as follows. Grade I is any deviation from the normal postoperative course without the need for pharmacologic treatment or surgical, endoscopic, and radiologic intervention. Allowed therapeutic regimens are drugs as antiemetics, antipyretics, analgesics, diuretics and electrolytes, and physiotherapy only. This grade also includes wound infections opened at the bedside. Grade II is requiring other medications, blood transfusion, or total parenteral nutrition. Grade III is requiring surgical, endoscopic, or radiologic intervention (Grade IIIa, intervention not under general anesthesia; Grade IIIb is intervention under general anesthesia). Grade IV is a life-threatening complication leading to single (IVa) or multiple (IVb) organ failures. Grade V comprised complications that led to death.

According to the 1991 National Institutes of Health Consensus Conference guidelines [14], patients were considered eligible for bariatric surgery for severe obesity if their BMI was at least 35 kg/m<sup>2</sup> and associated with obesity co-morbidity, or at least 40 kg/m<sup>2</sup> in the absence of co-morbidity. Ten faculty surgeons performed LRYGB during different periods of the duration of the study. In general, a biliopancreatic limb of 30 to 75 cm and an alimentary limb of 50 to 150 cm were measured, and a linear stapler was used to create a side-to-side jejunojejunostomy (JJ) that was completed either hand-sewn or with another linear stapler firing. The mesenteric defect at the JJ was routinely closed, and Petersen defect was closed at the discretion of the attending surgeon, both with nonabsorbable sutures. A lesser curvature based gastric pouch measuring approximately 5 cm was created using a linear stapler. The alimentary limb was approximated to the gastric pouch either with antecolic or retrocolic position and a gastrojejunostomy (GJ) was created using a circular or linear stapler.

## Statistical analysis

Numeric variables were presented as mean  $\pm$  standard deviation and compared using Student's *t* test, whereas categorical variables were compared using Fisher's exact test. Statistical significance was determined if  $P \leq .05$ . IBM SPSS Statistics for Windows, Version 24.0 (IBM Corp., Armonk, NY, USA) was used for all statistical analyses.

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