Gastric remnant perforation due to trocar site herniation after laparoscopic Roux-en-Y gastric bypass

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ABSTRACT

A 39-year-old woman was admitted with colicky left upper-quadrant pain, dyspnoea, low-grade fever, tachycardia and a subtle left upper-quadrant tenderness without leucocytosis. Computed tomography revealed a distended gastric remnant due to small-bowel loop herniation at the trocar site. The patient underwent a diagnostic laparoscopy as her general condition worsened. Perforation across the staple line was seen and repaired. The postoperative period was uneventful.

As a rare complication of laparoscopic Roux-en-Y gastric bypass, small-bowel obstruction is of great importance because it can lead to gastric remnant perforation if not managed correctly. There have been rare reports of trocar site herniation as a cause of small-bowel obstruction following laparoscopic Roux-en-Y gastric bypass. Prompt diagnostic laparoscopy should be considered. This is the first case reported in which the excluded stomach was perforated due to trocar site herniation of the small-bowel loop. It should be noted that the tissue around the perforation is fragile and proper tension should be employed when it is repaired. Generally, an omental patch is not encouraged.

KEYWORDS

Roux en Y – Case report – Trocar site hernia – Gastric remnant – Blow out

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Introduction

Small-bowel obstruction is a well-known complication of laparoscopic Roux-en-Y gastric bypass, occurring in approximately 1.2–7.5% of patients.¹ Although infrequent, this condition is a real emergency which can end in perforation of excluded stomach if not treated. Early small-bowel obstructions occur within 30 days of the procedure and those occurring after this period are termed late obstructions. The most common aetiology for early obstructions after laparoscopic Roux-en-Y gastric bypass is stenosis (technical error, kinking or clot) at the jejunojejunostomy and the most common cause of late obstructions is thought to be adhesions. Small-bowel loop incarceration through internal defects (jejunojejunal mesentery defect, Peterson's defect) and abdominal wall defects (incisional hernia, trocar site hernia) are also considered as aetiologies. While a few cases of trocar site hernia are reported, we report the first gastric remnant perforation due to trocar site herniation after laparoscopic Roux-en-Y gastric bypass.

Case history

The patient was a 39-year-old woman (height 155 cm, weight 102.5 kg and body mass index 42.6 kg/m²). Her eating habits included snacking and nibbling. She had a history of repeated heartburn, hypothyroidism (levothyroxine 50 mg/day), treated peptic ulcer disease with eradicated *Helicobacter pylori* and three caesarean sections were mentioned. The patient had undergone laser lipolysis four years before the bariatric surgery. There was a medium-sized hiatal hernia on oesophagogastroduodenoscopy. Grade two fatty liver and gall bladder sludge were seen on ultrasonography.

The patient underwent laparoscopic Roux-en-Y gastric bypass (biliopancreatic limb length 120 cm and alimentary limb length 75 cm). The operation time was 90 minutes; 45-mm blue and 60-mm white staplers were used for gastrojejunal and jejunojejunal anastomoses, respectively. There was an inadvertent proximal alimentary limb perforation caused by harsh bougie insertion, which was repaired primarily. We routinely place a corrugated drain

Figure 1 Intravenous and oral computed tomography of the abdomen: a) dilated gastric remnant (top); b) trocar site herniation (bottom).

in laparoscopic Roux-en-Y gastric bypass and close the jejunojejunal defect, but leaving Peterson's defect open.

On first postoperative day, we performed methylene blue leak test and initiated a clear liquid diet. The postoperative period was uneventful and the drain was removed on day three postoperatively. The patient was on oral pantoprazole 40 mg 12 hourly on discharge.

On postoperative day 5, the patient was readmitted for colicky left upper-quadrant pain that started one day before readmission and dyspnoea. On examination, her oral temperature was 37.8 degrees C, pulse rate

Figure 2 Small-bowel loop incarcerated through trocar site.

108 beats/minute and respiratory rate 16 breaths/minute. Her abdomen was somewhat distended and subtle left upper-quadrant tenderness was detected. A leucocyte count of $7400/\text{mm}^3$ (range $4000\text{--}10000/\text{mm}^3$) and $2+$ C-reactive protein were noted. Oral and intravenous contrast computed tomography (CT) was performed four hours after admission and trocar site small bowel loop incarceration with severe gastric remnant dilation were seen with no free air or fluid collection (Fig 1). The patient's pain and tenderness were deteriorating and her pulse rate rose to 140 beats/minute after adequate rehydration. She was planned for exploratory laparoscopy about six hours after admission.

Management

After proper rehydration the patient was taken to the operating room. There was no sign of diffuse peritonitis and we did not identify any internal herniation through the Peterson's and jejunojejunal defects. A loop of jejunum was incarcerated into the 12-mm left lateral trocar site and distended biliopancreatic limb was seen proximal to it (Fig 2). A huge gastric remnant was also seen. We reduced the incarcerated loop, which was viable with no gangrene.

While we turned towards the left upper-quadrant and separated the gastric pouch from the remnant. We suddenly entered a collection of 800 cc of bilious fluid and, after drainage, a perforation site was found at the medial border of the gastric remnant, close to the staple line (Fig 3). We repaired the perforation in two layers using 2-0 PDS separate sutures and fixed a patch of omentum over

Figure 3 Perforation site at the stomach remnant.

it. No gastrostomy was done; the remnant content was drained during surgery and we did not anticipate prolonged postoperative ileus. The abdomen and pelvis were carefully irrigated and a drain was placed at the left upper-quadrant. The 12-mm trocar site fascial defects were closed. Intravenous antibiotic therapy with imipenem (500 mg every six hours) and metronidazole (500 mg every eight hours) were started, as well as intravenous pantoprazole 40 mg every 12 hours. Per oral clear liquid was started the day after surgery and the patient discharged at the third postoperative day. The drain was removed a week after surgery. Now, after five months from surgery, the patient has proper weight loss and normal post-operative condition.

Discussion

Laparoscopic Roux-en-Y gastric bypass is now considered the most prevalent bariatric surgery worldwide (49.4%),² thus bariatric and general surgeons should carefully be aware of its complications. Small-bowel obstruction, although not common, is of great importance because if not managed properly it can lead to gastric remnant perforation. The most common symptom is pain (91%) followed by nausea, vomiting, bloating and rarely dysphagia.

Common Imaging features of small-bowel obstruction such as dilated loops of bowel with collapsed loops distally are seen at plain x-rays and CT, which can be subtle in chronic cases. Every surgeon should have high level of suspicion for internal hernia when facing small-bowel obstruction in the patient with laparoscopic Roux-en-Y gastric bypass. The most accurate CT sign for internal hernia is 'mesenteric swirl', which refers to appearance of vessels or fat at the base of mesentery.

The most common aetiology of early small-bowel obstruction after laparoscopic Roux-en-Y gastric bypass is obstruction at the jejunojejunal anastomosis, mostly caused by technical error, angulation and clot or bezoar.³ Scozzari *et al* reported a high incidence of trocar site hernia after laparoscopic Roux-en-Y gastric bypass (which is usually underestimated), but there have been rare reports of trocar site herniation as a cause. Prompt diagnosis is essential because intestinal or omental strangulation and necrosis may occur. Roger *et al* reported in 2015 that routine closure of the fascia at trocar sites as large as 12 mm is not necessary (especially above the arcuate line) because in these cases herniation usually does not contain bowel loops and does not have symptoms.⁵ We usually do not repair the trocar site in laparoscopic Roux-en-Y gastric bypass, but closure is done in redo surgeries.

Our case is the first reported in which the excluded stomach was perforated because of trocar site herniation of the small-bowel loop. As a centre of excellence, we have a special protocol to manage suspected small-bowel obstruction after laparoscopic Roux-en-Y gastric bypass. If the patient vomits (not nausea) even once in the early postoperative period, an exploratory laparoscopy should be done in order to rule out small-bowel obstruction, because missed strangulation can lead to a catastrophe. Unfortunately, in this case, we did not see any obvious symptoms and signs and the time spent on imaging may have led to perforation. In terms of surgical technique, it should be noted that the tissue around perforation is too fragile and proper tension should be employed. Generally, an omental patch is not encouraged today, but we did put a patch over the repaired site.

Conclusion

As laparoscopic Roux-en-Y gastric bypass is one the most prevalent bariatric surgeries, its complications such as small-bowel obstruction should be borne in mind. Prompt diagnosis and intervention should be key points. While nonsurgical management has been proposed in some studies, the proper intervention is laparoscopy to identify the cause and repair it. This case emphasises the importance of timely laparoscopy, otherwise gastric remnant perforation is the anticipated consequence.

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