



Chylous Ascites in the Setting of Roux-En-Y Gastric Bypass: Case Report and Review of the Literature

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Abstract

Roux-en-Y gastric bypass (RYGB) is one of the most frequently preformed bariatric and metabolic procedures worldwide. It can present with both early and late complications. We report a case of chylous ascites due to internal hernia in a patient who underwent open RYGB surgery 13 years prior. The patient presented with acute on chronic left upper quadrant abdominal pain with radiation to the left flank. CT scan of the abdomen and pelvis with oral and IV contrast demonstrated mesenteric and small bowel edema with a twist in the mesentery and poor pacification of the distal portion of the superior mesenteric vein, consistent with an internal hernia. At diagnostic laparoscopy internal hernia was reduced, mesenteric defect was closed, and cream-colored peritoneal fluid with elevated triglycerides (771 mg/dL) was identified. A diagnosis of chylous ascites due to obstruction of lymphatic channels from an internal hernia post RYGB was made. Internal hernia is a known complication of RYGB, which can infrequently present as chylous ascites. Surgical reduction of internal hernia and closure of mesenteric defects results in resolution of chylous ascites.

Introduction

Roux-en-Y gastric bypass (RYGB) accounts for 45% of bariatric and metabolic surgery worldwide [1]. In 2016, this operation is performed using a minimally invasive approach in over 90% of cases. RYGB is both a restrictive and malabsorptive operation. The restrictive component is attributed to a small proximal gastric pouch and small aperture of gastrojejunostomy anastomosis between the gastric pouch and the Roux limb. The malabsorptive component is attributed to exclusion of 75-150 cm of jejunum during formation of the Roux limb. Two enteric anastomoses are performed during this operation including a proximal gastrojejunostomy and a distal jejunojunctionostomy. Indications for surgery in North America are based on 1991 NIH consensus criteria, which include: BMI ≥ 35 kg/m² with one or more obesity-related comorbidities (obstructive sleep apnea, diabetes, hypertension, dyslipidemia and others) or BMI ≥ 40 kg/m² without obesity related comorbidities [2]. Outcomes of RYGB include a mean BMI decrease of 14.2 kg/m², a mean absolute weight loss of 40 kg, resolution or improvement of diabetes in 93 % of patients, improvement in hyperlipidemia in 97 %, resolution or improvement in hypertension in 87 %, and resolution or improvement in obstructive sleep apnea in 95 % of patients [3].

There are a number of early and late complications associated with a laparoscopic RYGB [4]. Early complications include bleeding (1.8%), anastomotic dehiscence (0.8%), infection (0.5%), thermal injury with perforation (0.4%), pulmonary embolism and/or deep venous thrombosis (0.4%) [5]. The most frequent late complications include internal hernia (16.1 %), stoma stenosis (1.9%), incisional ventral hernia (1.0%), marginal ulcer (0-8%) and gastrogastic fistula (0.4%) [5].

Case Presentation

We report the case of a 46-year-old female with a surgical history of an open Roux-en-Y gastric bypass, open ventral hernia repair without mesh, panniculectomy, Cesarean section, and laparoscopic cholecystectomy. This patient presented with a 24-hour history of acute on chronic left-sided upper abdominal pain with radiation to the left flank. Her pain was associated with nausea and obstipation without vomiting. She previously had two similar episodes, which resolved spontaneously. On physical examination she was afebrile with normal vital signs. She was tender to palpation in the left upper quadrant without guarding or peritonitis. Laboratory investigation demonstrated a normal complete blood count and chemistry, as well as lactate. Imaging with a CT scan of the abdomen and pelvis with oral and IV contrast demonstrated mesenteric and small

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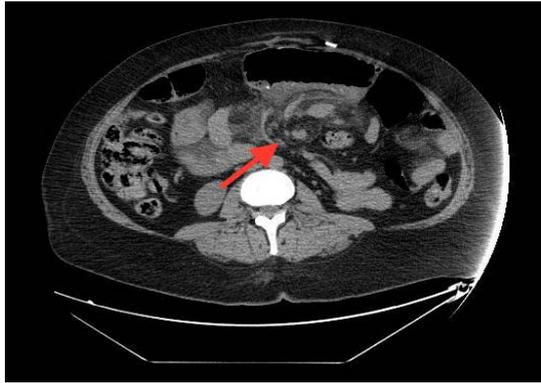


Figure 1: Mesenteric Swirl.



Figure 2: Mesenteric Edema.

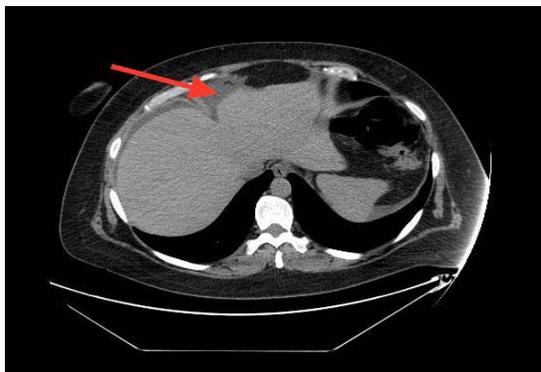


Figure 3: Free Fluid.

bowel edema with a twist in the mesentery and poor pacification of the distal portion of the superior mesenteric vein (Figures 1 and 2). A significant amount of free fluid was also identified (Figure 3). Radiographic findings were most compatible with a differential diagnosis of mesenteric volvulus and/or an internal hernia. Operative exploration was recommended for presumptive diagnosis of internal hernia post-RYGB.

On diagnostic laparoscopy, the entire small bowel was examined beginning at the terminal ileum proximally towards the jejunojunostomy anastomosis. With gentle traction on the common channel, the internal hernia was reduced and a defect at the jejunojunostomy mesentery was identified. The biliopancreatic limb and retrocolic Roux limb were identified and examined. The entire small bowel appeared healthy with no signs of ischemia or infarction. The jejunojunostomy mesenteric defect was closed with a running non-absorbable suture. There was no evidence of a

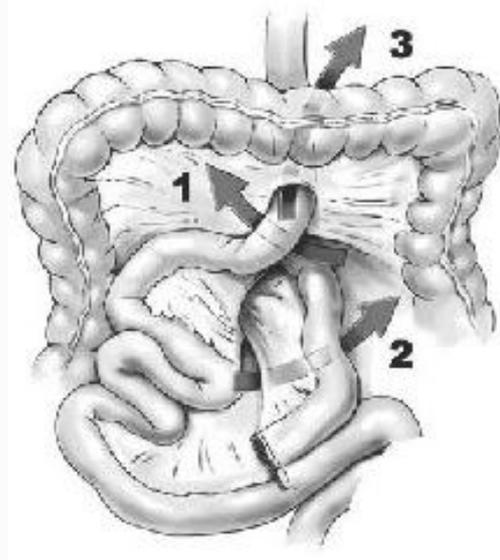


Figure 4: Locations of Internal Hernia.

mesenteric defect in transverse mesocolon or in the Petersen's space. There was a significant quantity of cream-colored intraperitoneal fluid and evidence of engorged lymphatic vessels within the bowel wall at the jejunojunostomy. Peritoneal fluid was sent for culture and sensitivity, as well as for triglyceride analysis. There were no other abnormalities identified on diagnostic laparoscopy.

Analysis of peritoneal fluid demonstrated elevated triglycerides at 771 mg/dl supporting the diagnosis of chylous ascites. There were no organisms or growth on microbiology. The patient was discharged from the hospital on 2nd post-operative day without complications. Repeat CT scan of the abdomen and pelvis with oral and intravenous contrast 1 month after the operation demonstrated absence of mesenteric twist and minimal free fluid in the peritoneum.

Discussion

Internal hernia is a known late complication of RYGB. Creation of mesenteric defects, decreased rate of adhesion formation with the use carbon dioxide gas during laparoscopy, and postoperative weight loss all contribute to internal hernia formation after laparoscopic RYGB [6]. Clinicians and surgeons should be familiar with causes, presentations, and possible complications of internal hernia following RYGB. There are three potential spaces for an internal hernia formation post RYGB – the jejunojunostomy mesenteric defect, the Petersen's space (the space created between the mesentery of the Roux limb and the transverse colon mesentery) and the transverse mesocolon defect, which is seen exclusively with the retrocolic position of the Roux limb [6] (Figure 4).

Typical presentation of an internal hernia can be either acute or chronic with progressive or intermittent abdominal pain, epigastric abdominal pain, and postprandial abdominal pain. Importantly, vomiting is not a common symptom for an acute presentation of an internal hernia [8]. Acute presentation necessitates emergent operative exploration. Laparoscopic or open exploration is the most sensitive test for diagnoses and treatment of an internal hernia; however, a CT scan of the abdomen can be positive in 85% of internal hernia cases. As such, CT scan is often used as a less invasive modality to confirm presence of an internal hernia prior to operative exploration [8].

Table 1: Incidence of post-operative chylous ascites during abdominal surgery [10].

Type of Procedure	Incidence of Postoperative Chylous Ascites
Gynecological pelvic surgery	0.17% to 2%
Colorectal surgery	1.0 to 6.6%
Hepatic surgery (including liver transplant)	4.7%
Nephrectomy	3.8-5.1%
Pancreatic surgery	1-11%
Gastrectomy and pancreaticosplenectomy	2.4%
post-chemotherapy retroperitoneal lymph node dissection for testicular cancer	7%

Patients with chronic presentation of an internal hernia typically describe vague, colicky abdominal pain that may change in character or disappear when the patient is placed in the lateral decubitus position. Nausea and postprandial vomiting may also be present [6]. Surgical exploration is indicated if clinical suspicion of internal hernia exists despite normal laboratory and imaging findings [7].

Closure of mesenteric defects at the time of primary RYGB operation has been shown to significantly reduce the need for reoperation due to an internal hernia and small bowel obstruction in the first 3 postoperative years (1.2% vs. 5.6%, $p < 0.001$) [8]. Cumulative incidence of an internal hernia can also be significantly reduced with mesenteric defect closure from 8.9 % to 2.5 % ($p < 0.0001$) [8].

Chylous ascites as was seen in our patient is a rare clinical manifestation of an internal hernia post RYGB. Classic definition of chylous ascites is triglycerides content of greater than 110 mg/dL [9]. Chylous ascites often has the appearance of milky non-purulent intraperitoneal fluid. There are several etiologies of chylous ascites. In North America, the most common etiologies are cirrhosis and peritoneal malignancies. The pathophysiologic mechanism responsible for the development of chylous ascites in these patients is an obstruction of the lymphatic vessels at the root of the mesentery or at the cisterna chyli, which results in exudation of chyle from dilated lymphatics both on the bowel wall and in the mesentery. Another etiology of chylous ascites is from exudation of chyle through the walls of dilated retroperitoneal lymphatic vessels, as in the case of lymphangiectasia or thoracic duct obstruction [9]. Direct operative trauma is another recognized etiology, where injury to the main chyle ducts, its branches, or lymph nodes during abdominal surgery results in a lymph-peritoneal fistula [10]. The incidence of post-operative chylous ascites during abdominal surgery is reported in Table 1 [10].

Surgical intervention for postoperative chylous ascites is generally reserved for cases that are refractory to medical management, which consists of a high protein, low fat diet that is high in medium chain triglycerides [11]. This diet results in decreased chyle production and flow, which successfully reduces the volume of chylous ascites in greater than 60% of patients [12]. Refractory cases of chylous ascites require surgical intervention, which involves identification and ligation of the chyle leak or peritoneovenous shunting.

Chylous ascites following RYGB is uncommon. In the literature, there are two previous reports of chylous ascites post laparoscopic RYGB and one report following laparoscopic adjustable gastric banding [12-14]. In the latter report, laparoscopic removal of the gastric band, ligation of the lymphatics, and the application of fibrin glue successfully treated patients who failed non-operative management. In our patient, the cause of the chylous ascites was obstruction of lymphatic vessels at the jejunojunostomy

secondary to an internal hernia through the mesenteric defect at the jejunojunostomy [15]. Relief of lymphatic obstruction by reduction of the internal hernia and closure of mesenteric defects resulted in resolution of chylous ascites.

Conclusion

Chylous ascites is a rare complication of RYGB surgery in the setting of an internal hernia. Clinicians and surgeons should be aware of this presentation of an internal hernia and its successful management by reduction of the hernia and closure of mesenteric defects.

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