CASE REPORT CRSLS

The Other Double Bubble Sign: Gastric Parastomal Hernia

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ABSTRACT

Introduction: A parastomal hernia (PSH) is an abnormal herniation of an intra-abdominal organ or other tissue through an intentionally created fascial defect at an ostomy site. PSHs commonly involve reducible mobile segments of omentum, intra-abdominal fat, and bowel. However, PSHs may rarely involve fixed intra-abdominal organs such as the stomach.

Case Description: A 68-year-old female underwent emergent Hartmann procedure for Hinchey III diverticulitis and subsequently developed a large reducible parastomal hernia. She was scheduled for an elective laparoscopic colostomy reversal. Prior to her scheduled reversal, the patient presented to the ED with anorexia, lack of colostomy output, emesis, and pain localized to her left lower quadrant. She was found to have gastric outlet obstruction secondary to herniation of the stomach through the left lower quadrant colostomy site. The patient was admitted and treated conservatively with resolution of her symptoms, but due to the high likelihood of recurrence, the decision was made to proceed with laparoscopic Hartmann colostomy reversal with coloproctostomy and primary closure of the fascia without mesh.

Conclusion: The contents of a PSH can become incarcerated causing obstruction, strangulation, necrosis and even perforation over time. Fortunately, in this case, herniation of the stomach was recognized early. The patient underwent repair of the hernia defect in order to prevent recurrence of gastric herniation and its potential detrimental complications. The decision regarding the technical aspects of ostomy reversal in terms of mesh selection require further study. In our case, mesh was not used due to patient-specific factors and comorbidities.

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INTRODUCTION/BACKGROUND

A parastomal hernia (PSH) is an abnormal herniation of an intra-abdominal organ or other tissue through an intentionally created fascial defect at an ostomy site. PSH is a major complication after stoma creation with a reported incidence as high as 50%.[5] Commonly PSHs involve reducible mobile segments of omentum, intra-abdominal fat, and bowel. However, there are reported cases, albeit rare, which involve fixed intra-abdominal organs such as the stomach and gallbladder.[2–4,6–9,11,12] This case presentation describes a 68-year-old female with gastric outlet obstruction (GOO) secondary to a large gastric containing parastomal hernia.

CLINICAL CASE

A 68-year-old female with a past medical history of deep vein thrombosis (DVT) and rheumatoid arthritis (RA) underwent emergent Hartmann procedure for Hinchey III diverticulitis 4 months ago. In the interim she developed a large, reducible parastomal hernia causing her discomfort and interfering with activities of daily living. Her medications included warfarin for DVT and daily 10 mg prednisone in addition to Golimumab for RA. After undergoing an unremarkable screening colonoscopy with evaluation of the rectal stump, she was scheduled for elective laparoscopic colostomy reversal.

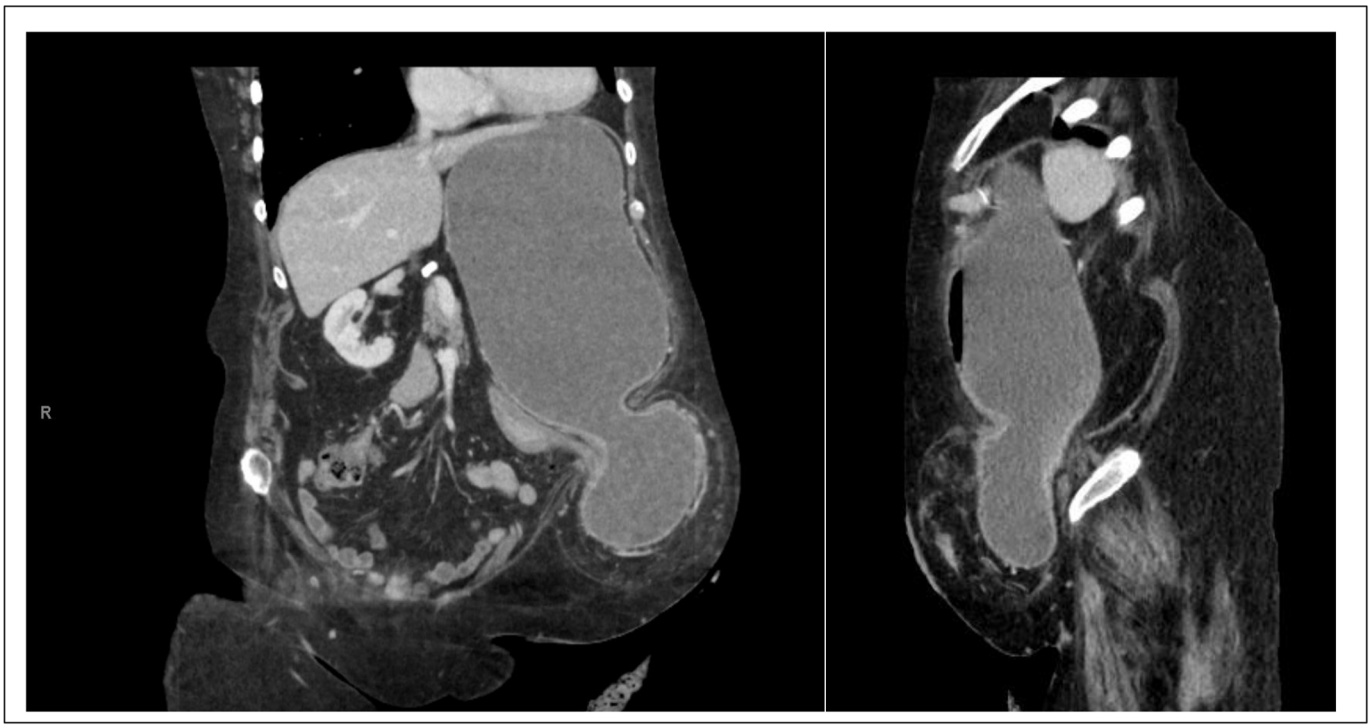

Figure 1. (Left) Coronal Computed Tomography view of stomach Herniating into left lower quadrant stoma. (Right) Sagittal Computed Tomography view of stomach Herniation into left lower quadrant stoma.

Four weeks prior to her scheduled surgery, she presented to the Emergency Department with 24 hours of anorexia, lack of colostomy output, and multiple episodes of emesis. Associated symptoms included sharp abdominal pain localized at the site of her left lower quadrant colostomy.

On clinical examination the patient's vitals were stable and she was afebrile. She was found to have tenderness to palpation around her colostomy and a large, soft, tender, reducible parastomal hernia. There were no overlying skin color changes and the stoma appeared

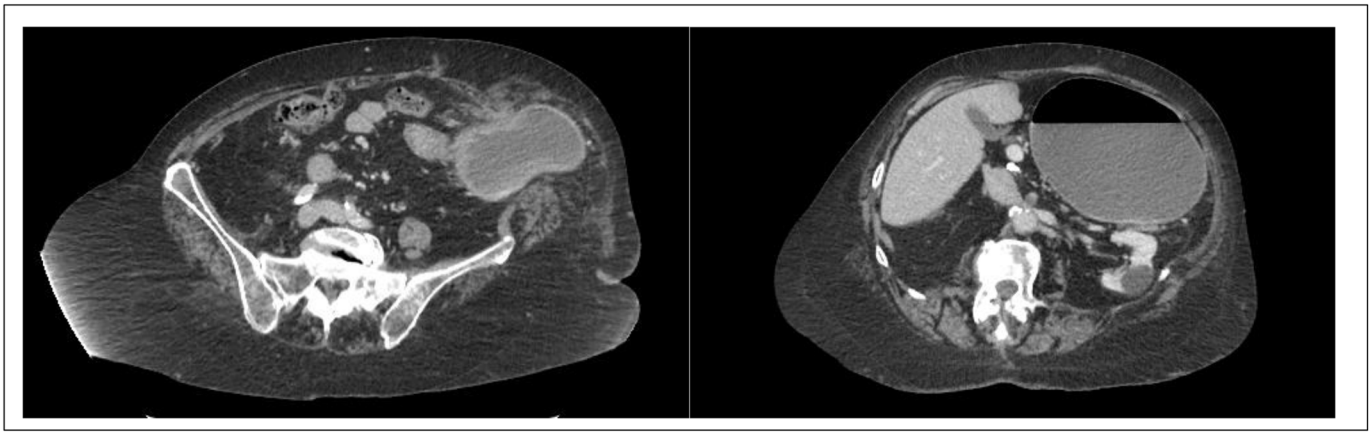

Figure 2. (Left) Axial Computed Tomography view of Parastomal Hernia containing portion of the stomach. (Right) Axial Computed Tomography view of Air/Fluid level in stomach in setting of gastric outlet obstruction secondary to gastric containing Parastomal Hernia.

pink, viable, and healthy with stool and gas within the ostomy appliance.

Laboratory workup revealed hypokalemic, hypochloremic metabolic alkalosis. Computed tomography (CT) imaging showed significant GOO secondary to herniation of the stomach through the left lower quadrant colostomy site, with significant distention and air fluid levels (**Figures 1 and 2**). The parastomal hernia defect measured 6 cm on CT.

The patient was admitted and managed conservatively with intravenous fluid resuscitation and nasogastric tube decompression. During her hospitalization, the patient's hernia remained reducible; however, her intra-abdominal contents immediately re-entered the hernia sac after reduction. Her ostomy began to function following nasogastric decompression. After thorough discussion with the patient, it was decided to proceed with colostomy reversal on this admission due to the high likelihood of symptom recurrence. Specifically, it was discussed with the patient that her immunosuppressive medications for RA can increase the chance for wound infection, anastomotic dehiscence, and incisional hernia. Her last dose of Golimumab was 3 weeks prior to surgery. The patient received Vitamin K for Warfarin reversal and tolerated a standard mechanical and antibiotic bowel prep.

On hospital day 2 the patient underwent laparoscopic Hartmann colostomy reversal with coloproctostomy and primary closure of the fascia without mesh. The colostomy was taken down first and a 29 mm EEA™ anvil was purse-stringed into the healthy descending colon end. A mini gel-port was then placed through the hernia defect for laparoscopic access. Adhesions were lysed laparoscopically through the mini gel-port, allowing insertion of additional 3 ports needed for adhesiolysis within the pelvis and to resect the remaining distal sigmoid colon. A supraumbilical 5 mm camera port and two 5 mm right lower quadrant/right upper quadrant ports were inserted. The residual sigmoid colon was resected via laparoscopic stapler through the mini gel-port, leaving healthy rectum in place. A colorectal anastomosis was performed using a 29 mm EEA™ stapler. Due to the inherent laxity in the patient's abdominal wall, her left lower quadrant fascia was reapproximated without tension and closed with interrupted 0-polydioxanone sutures. The colostomy site skin was reapproximated loosely with a purse-string 2-0 monofilament absorbable suture, allowing for drainage. She had an uneventful postoperative course and was discharged to rehab on postoperative day 4. At 1-year follow-up, the patient had no evidence of incisional hernia.

DISCUSSION

PSHs are a common complication after stoma creation and the reported incidence is as high as 50% depending on the type of ostomy created.[6] In this case, our patient had an end colostomy, which is complicated by a parastomal hernia rate of 4%–48%.[6] Most PSHs contain intra-abdominal fat, omentum, or bowel. Rarely they can contain other intra-abdominal organs such as the stomach and gallbladder.[2,4,5,7–10,12,13] Only six cases of PSHs containing stomach have been reported in the literature.

It is rare to encounter herniation of the stomach through a stoma defect, since it is a relatively fixed organ with multiple attachment sites within the intra-abdominal cavity, including hepatogastric, gastrophrenic, and gastrosplenic ligaments. The stomach is also surrounded by multiple intra-abdominal structures such as the diaphragm, liver, spleen, and transverse colon; which lend themselves to the integrity of the placement of the stomach and unlikeliness of herniation.[12] Nevertheless, over time and with increasing force on the fascial defect, it is possible for these attachments to undergo stretching and elongation. If the constant intra-abdominal pressure and the resulting stress on the fascia leads to enlargement of the previously created fascial defect, it is possible, as in our patient, for the stomach to herniate into this defect. Additional factors including (but certainly not limited to) obesity, malnutrition, malignancy, infection, emergency construction of ostomy, immunosuppressive drugs, tobacco abuse, and chronic obstructive pulmonary disease all place patients at an increased risk of developing a PSH.[1,6,12,16]

Most PSHs are asymptomatic, but they do carry the danger of becoming incarcerated or strangulated. This can lead to obstruction, gangrene, or perforation of the specific organ contained within. If the patient is asymptomatic or has a reducible hernia with minimal bloating and discomfort, a PSH can be treated nonoperatively with an abdominal binder or ostomy belt, as well as regular abdominal examinations. Symptoms that may indicate need for surgical intervention include irreducible bulge, severe pain, and obstructive symptoms including nausea, vomiting, distension, and obstipation.

Diagnosis is primarily a clinical one and utilizes history and physical examination. It is important to both digitally examine the stoma and examine the external parastomal tissue. Abdominal plain films with contrast or CT imaging can be utilized as additional tools to identify the severity, location, and contents of a PSH. CT imaging is particularly useful in that it can provide additional views of the defect

and reveal findings of free air or pneumatosis which could indicate perforation or necrosis of the contained structures, necessitating operative intervention.

One in five patients will develop an incisional hernia following primary closure of fascia during ostomy reversal.[17] Historically, it was determined that the best way to treat an incisional hernia following ostomy reversal was preventing it in the first place, thus popularizing the Sugarbaker technique. This technique utilizes commercially available "parastomal" mesh at the time of ostomy creation, which is introduced into the peritoneum and centered about the stoma site and secured with transfascial sutures. The colon is brought through the stoma site, and just prior to ostomy maturation, the mesh is secured circumferentially with an intraperitoneal tacking device (to avoid subsequent development of internal hernia). This mesh is specifically designed with a central band of antiadhesive coating, which decreases the chance of mesh erosion into the colon. When possible, the omentum is positioned between the mesh and small bowel as well. Multiple studies have shown the modified Sugarbaker technique to be an effective method to substantially decrease the rate of PSH occurrence, while offering minimal mesh related complications.[11,18,19]

If a mesh repair is not implemented at the index operation (the ostomy creation itself), the mainstay of operative management of an existing PSH becomes ostomy reversal with closure, revision, resiting, and mesh repair. Until recently, it was thought that a stoma closure using a mesh was unsafe, due to a type 2 clean-contaminated wound class. However, current literature suggests that in certain situations, it may be appropriate to attempt biologic or even synthetic mesh placement prophylactically to prevent incisional hernia in the setting of ostomy reversal.[3,17,20] One such landmark trial, the ROSCC trial, randomly assigned 790 patients in 36 hospitals to either biologic mesh closure or primary suture closure of ostomy site following reversal, and demonstrated a statistically significant decrease in incisional hernia after 24 months in the biologic mesh group compared to the primary closure group, without increase in wound infection.[3] Another study utilized synthetic mesh placed in the retromuscular space directly posterior to the rectus muscle and anterior to posterior rectus sheath with statistically significant decrease in hernia at the stoma site and without increased rates of infection.[20] However, these studies for the most part have included only a small number of patients at single centers, and have also been done in the elective situation, which we were unable to extrapolate directly to our patient in this case study. Existing studies are limited by short follow up and more long-term data is needed before utilization of biologic mesh is to be fully adopted for this purpose. Biologic mesh is often preferred over synthetic mesh, due to the unavoidable contamination involved in closing an ostomy site.[3,17,20] The prohibitive cost of biologic mesh, surgeon comfort level, and concern for wound infection remains an important factor in the decision to use mesh prophylactically to prevent incisional hernia at ostomy sites, even in elective oncologic resections, from which much of the data is drawn.

In our case, the gastric containing PSH required surgical repair, as the hernia was easily reducible but would recur soon after reduction. Furthermore, this patient's PSH had a high potential to cause recurrent GOO, putting the stomach at risk for incarceration and perforation, as was reported in a prior case report.[8] Therefore, surgical repair of the PSH was completed during the index hospitalization as outlined above. Placement of mesh during this patient's initial surgery was contraindicated due to the gross contamination from Hinchey III diverticulitis and the emergent nature of the surgery. However, the decision to not reinforce her fascial closure with mesh at the time of her colostomy reversal was influenced mainly by the high risk for mesh infection due to having a colostomy and being on immunosuppressive medications. The patient is this case study was on Golimumab for her RA and due to the urgent nature of the surgery in her case, this medication was not able to be discontinued pre-operatively. There is some data to support holding anti-tumor necrosis factor (TNF) agents in the setting of intestinal anastomosis. Though much of this data includes patients who are on Infliximab for the treatment of irritable bowel disorder whom ultimately required resection, it is reasonable to assume a similar effect on wound healing in our patient taking Golimumab (both drugs being anti-TNF). Therefore, if this procedure had been done electively, we would have held the medication preoperatively based on current available data. It remains controversial whether anti-TNF agents have a negative impact on anastomotic healing, and animal studies have demonstrated microbiologic effects of anti-TNF agents on intestinal healing without a statistically significant difference in burst pressure or incidence of intra-abdominal sepsis.[14] What is relevant in our patient however, is that these agents are detrimental to healing and therefore a risk factor for postoperative infection,[15] thus further deterring us from using a mesh in this patient. Nevertheless, measures were taken to reduce the risk of wound infection with our patient, specifically: antibiotic bowel prep, minimally invasive surgery, mini gel port wound protector, and purse-string reapproximation of the skin.

CONCLUSION

PSHs are a common occurrence that we as surgeons see frequently. PSHs can often be managed nonoperatively if the patient has little or no symptoms. The importance of this case is to recognize PSHs can contain not only fat, omentum, and/or bowel, but can, on rare occasion, contain other organs such as the stomach. Even patients with asymptomatic, reducible hernias, should regularly undergo examination of the abdomen and stoma to monitor for any change in the clinical examination. Over time, the contents of a PSH can become incarcerated causing obstruction, strangulation, necrosis, and even perforation. Fortunately, in this case, herniation of the stomach was recognized early using physical examination and CT imaging. The decision was therefore made to reverse the ostomy and surgically repair the hernia defect without delay in order to prevent recurrence of gastric herniation and its potential detrimental complications.

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