

# An Atypical Cause of Colonic Obstruction: A Hiatal Hernia after Sleeve Gastrectomy Containing the Transverse Colon

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<b>Background</b>	Hiatal hernia formation after undergoing either sleeve gastrectomy or Roux-en-Y gastric bypass for morbid obesity is an uncommon postoperative event with only several cases reported in the literature. Type 4 hiatal hernias are the most rare, as they comprise approximately 0.4 percent of all hiatal hernias. Organs that may be involved include the spleen, small bowel, and pancreas, but the most common is the transverse colon.
<b>Summary</b>	We describe the first reported case of a type 4 hiatal hernia causing colonic obstruction in a patient after surgery for morbid obesity. The patient presented with vague abdominal pain and concern for partial bowel obstruction. Her only past surgical history included a sleeve gastrectomy for morbid obesity approximately two years prior. Imaging evaluation revealed a type 4 hiatal hernia containing a portion of her transverse colon resulting in partial colonic obstruction. Laparoscopic hernia repair was performed, but without an anti-reflux procedure due to her postoperative gastric anatomy. A review of the literature regarding type 4 hiatal hernia repair is discussed along with a review of postoperative complications after both sleeve gastrectomy and Roux-en-Y gastric bypass for morbid obesity.
<b>Conclusion</b>	More common complications after surgery for morbid obesity include leak from staple or suture lines, abscess formation, bleeding, and isolated stomach herniation through the esophageal hiatus; however, type 4 hiatal hernias can also occur in this patient population—40 percent of patients have this pathology prior to their operation. Hiatal hernias after surgery for morbid obesity have been reported in both the immediate and long-term postoperative period. Because transverse colon can frequently be involved in type 4 hiatal hernias, a high suspicion for this pathology as a source of obstruction must be considered as part of the differential diagnosis.
<b>Keywords</b>	Hiatal hernia, colon obstruction, morbid obesity

**DISCLOSURE:**

The authors have no conflicts of interest to disclose.

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## Case Description

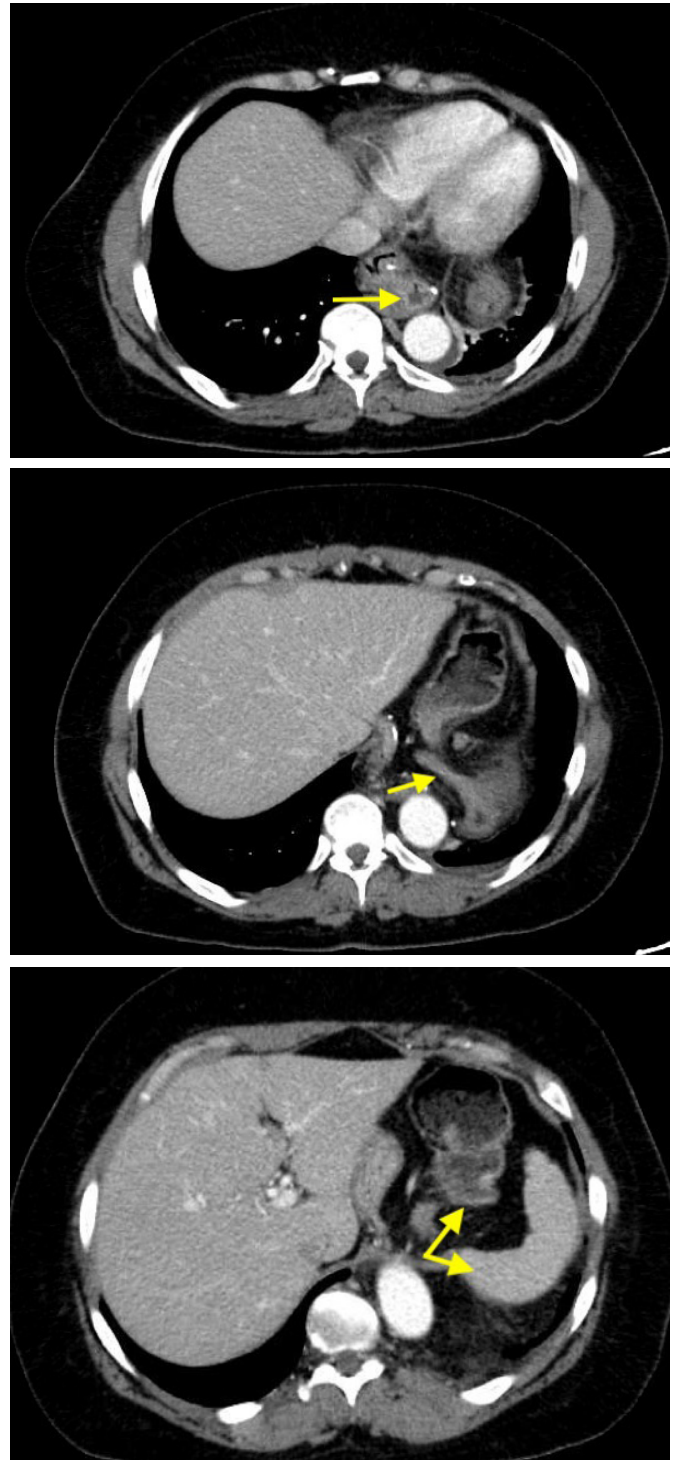
The patient, a 52-year-old female, presented to the emergency room one evening with a complaint of vague, crampy, lower abdominal pain that had been present for approximately twenty-four hours. She had mild nausea and anorexia, but she denied any emesis. The patient also reported she had not had a bowel movement in two days and did not recall passing flatus in the past 24 hours. She lived alone and did not report any recent contact with sick individuals or recent travel outside of the United States.

A complete review of systems revealed that she had no systemic symptoms and no other complaints that day. Her medical history was notable for hypertension, chronic lower back pain, and morbid obesity with a body-mass index (BMI) of 42. Her only surgical history was a sleeve gastrectomy approximately two years prior, with a minor weight loss of 42 pounds since the operation. She had no significant family or social history.

Routine laboratory tests were obtained that revealed a mild leukocytosis with a white blood cell count of 11,000 K/mm<sup>3</sup>. A computed-tomography scan of the abdominal and pelvis was performed that revealed a type 4 hiatal hernia containing a portion of the mid-transverse colon resulting in a partial colonic obstruction (see Figure 1).

The patient was admitted and underwent intravenous fluid resuscitation. Because she had no emesis, no evidence of complete obstruction, and a competent ileocecal valve, no nasogastric tube was placed. Given the mechanical obstruction seen on imaging, our surgical team discussed the options for conservative or operative management with the patient. Conservative management was discussed, including nasogastric tube (NGT) decompression, continued intravenous fluids, daily laboratory markers, and serial abdominal exams. Consideration was given both to the fact that this treatment modality may fail as well as to the risks of organ ischemia if progression occurred. Given both the patient's sleeve gastrectomy and current hiatal hernia, we also informed her that NGT placement might be difficult. The patient felt that surgical treatment with reduction of the colon and correction of the hernia defect was her best option for definitive resolution of her symptoms.

The patient was taken to the operating room the next day for laparoscopic hiatal hernia repair. Both the stomach and transverse colon were gently reduced back into the abdominal cavity using blunt bowel graspers. Due to the patient's,



**Figure 1.** Axial CT images showing the presence of a hiatal hernia. A) Portion of large colon entering the hernia defect posterior to the esophagus; B) Decompressed colon distal to the colonic obstruction; C) Stomach and spleen within the abdomen near the defect.

prior sleeve gastrectomy, some peri-hiatal scar tissue was present that required lysis to aid in the full reduction of the stomach. A posterior cruroplasty was performed with non-permanent mesh reinforcement. A fundoplication was not performed because of her prior sleeve gastrectomy. Fluoroscopy obtained on postoperative day number one showed patency of the proximal upper gastrointestinal tract. The patient was immediately started on a general diet postoperatively and was able to be discharged home on the evening of postoperative day number two.

## Discussion

The four types of paraesophageal hernias are migration of the gastroesophageal (GE) junction above the esophageal hiatus (type 1), herniation of a portion of the stomach without movement of the GE junction (type 2), herniation of both the GE junction and a portion of the stomach (type 3), and herniation of both the stomach and other abdominal organs (type 4).<sup>1</sup> Type 4 hernias most commonly contain the transverse colon, followed by the spleen, small bowel, large bowel, and pancreas.<sup>2,3</sup> While there are several case reports of colonic obstruction due to hiatal hernia, there are none describing this condition after undergoing bariatric surgery.<sup>4-9</sup>

Sleeve gastrectomy is currently the most commonly performed procedure for morbid obesity.<sup>10</sup> Postoperative complications include staple line leak, abscess formation, bleeding, trocar site herniation, bowel obstruction secondary to adhesive disease, and, according to more recent reports, hiatal hernia formation.<sup>11,12</sup> The incidence of hiatal hernia in morbidly obese patients undergoing bariatric surgery is reported to be as high as 40 percent; if found during preoperative evaluation or intraoperatively, concomitant repair should be performed.<sup>13,14</sup> Several cases of both acute and delayed hiatal hernia formation after either sleeve gastrectomy or Roux-en-Y gastric bypass have been reported in the literature, but none containing the large colon.<sup>15,16</sup>

It is imperative that physicians hold a suspicion for hiatal hernias in patients after bariatric surgery as a source of both gastric and bowel obstruction.<sup>8</sup> A diagnosis can be made swiftly radiographically with barium study or computed tomography.<sup>1</sup> Repair can be performed either laparoscopically or open and follows standard hiatal hernia repair. Surgical correction includes reduction of the contents of the hernia sac back into the abdominal cavity, hernia sac resection, approximation of the diaphragmatic crus with or without mesh reinforcement, and gastropexy.<sup>3</sup>

Performing a fundoplication after bariatric surgery is not technically feasible because of the lack of redundant gastric tissue due to prior sleeve gastrectomy. Mesh reinforcement is proven to have a lower incidence of recurrence than primary repair. Although there is no difference in complication rates between synthetic or biologic mesh, synthetic mesh proves to have a lower recurrence rate compared to that of biologic mesh.<sup>17</sup>

## Conclusion

Hiatal hernias after sleeve gastrectomy are uncommon, but should be included in the differential diagnosis of a patient presenting with obstructive symptoms after surgery for morbid obesity. If diagnosed, urgent surgical exploration is required for reduction of the hernia contents to ensure that no sequela of obstruction occurs. While standard hiatal hernia repair can be safely achieved, an anti-reflux procedure is omitted due to limited stomach volume to create a fundoplication.

## Lessons Learned

When hiatal hernias are seen preoperatively or intraoperatively for bariatric surgery, surgical correction should ideally be performed with mesh reinforcement to prevent further clinical progression. Because transverse colon can frequently be involved in type 4 hiatal hernias, a high suspicion must be kept for the possibility of obstruction after sleeve gastrectomy for such pathology.

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