Contained Leak Following Laparoscopic Sleeve Gastrectomy: Successful Management with Endoscopic Wound Vacuum Therapy and Stenting

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ABSTRACT

We report the case of a 32-year-old male with a history of hypertension and obesity who developed perigastric abscess and staple line dehiscence two weeks after undergoing laparoscopic sleeve gastrectomy, consistent with a contained staple line leak. The patient presented with fever, abdominal pain, and imaging-confirmed abscess at the gastric cardia. Management included multiple endoscopic wound vacuum exchanges, eventual esophagogastric stent placement, and nutritional support. The case demonstrates a multidisciplinary approach to a complex post-bariatric surgery complication, highlighting the role of advanced endoscopic therapies in avoiding open surgical re-intervention.

INTRODUCTION

Laparoscopic sleeve gastrectomy is a widely used bariatric procedure with generally favorable outcomes. However, staple line leaks remain one of its most serious complications. Traditional management has included surgical drainage or re-operation, but endoscopic therapies, such as endoluminal wound vacuum systems and stenting, are increasingly employed to achieve source control and promote healing in carefully selected patients.

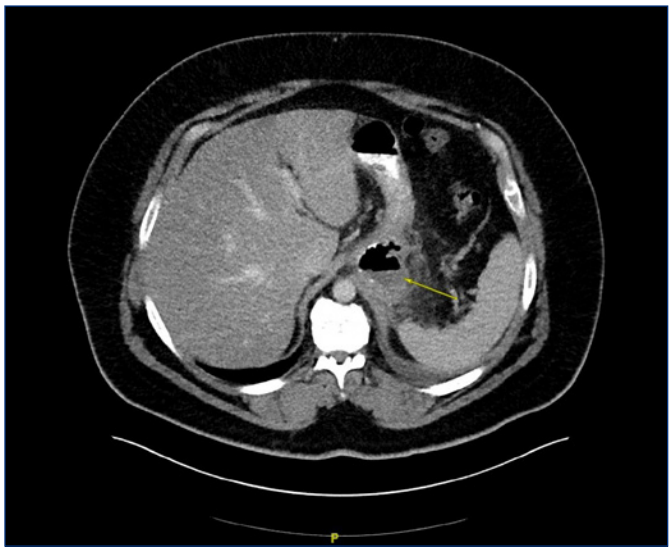
CASE PRESENTATION

A 32-year-old male with a medical history of hypertension and morbid obesity presented with three days of worsening epigastric pain, fever, chills, and decreased appetite approximately 14 days after undergoing an uncomplicated laparoscopic sleeve gastrectomy at an outside hospital. On presentation, the patient was awake, alert, and in no acute distress. Vital signs were notable for a temperature of 100.8 °F, heart rate of 108 beats per minute, blood pressure of 148/88 mm Hg, respiratory rate of 16 breaths per minute, and oxygen saturation of 97% on room air. The abdominal examination revealed a soft but tender abdomen, with tenderness localized to the epigastric region and lower quadrants, without guarding, rebound, or other peritoneal signs. The remainder of the physical examination – including HEENT, pulmonary, cardiovascular, extremities, and neurologic systems – was unremarkable.

Laboratory evaluation demonstrated leukocytosis with a white blood cell count of 15.9 × 10^9/L and neutrophil predominance (80.4%). Serum potassium was decreased at 3.1 mEq/L. The anion gap was mildly elevated at 17. Renal and hepatic function tests were within normal limits.

A computed tomography angiography (CTA) of the chest, abdomen, and pelvis with intravenous contrast was performed. The study was non-diagnostic for pulmonary embolism but revealed a small reactive left pleural effusion with associated atelectasis. Importantly, imaging demonstrated gastric staple line dehiscence at the level of the cardia/fundus, associated with a 4.7 cm perigastric abscess and adjacent inflammatory fat stranding [**Figure 1**].

Figure 1. Axial CT scan demonstrating staple line dehiscence and a contained extraluminal fluid collection.



HOSPITAL COURSE

Upon admission, the patient was made NPO, started on lactated ringers intravenous fluids (125 mL/hr), intravenous antibiotics and antifungals (piperacillin-tazobactam and fluconazole). Discussions were had with interventional radiology to determine whether an image-guided percutaneous drain could be placed within the abscess cavity; however, this was determined to not be possible due to lack of a safe window.

Figure 2. Initial endoscopic evaluation demonstrating the true lumen (green arrow) and the abscess cavity and staple line dehiscence (blue arrow).

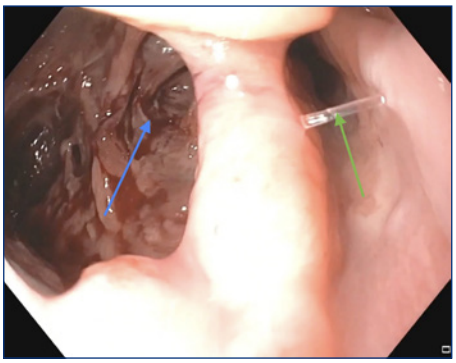


Figure 3. Endoluminal vacuum exchange on hospital day 7 showing formation of granulation tissue in the wound bed.

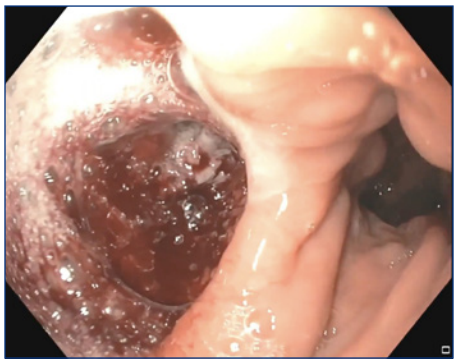
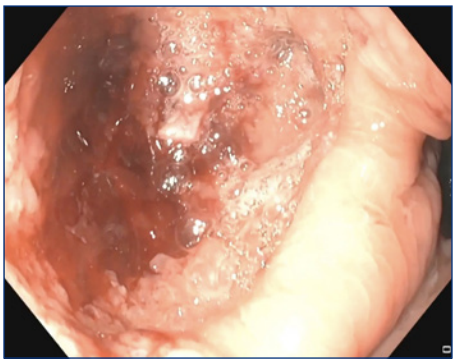


Figure 4. Endoluminal vacuum exchange on hospital day 21 showing significant reduction in size.



An upper gastrointestinal series on hospital day (HD) 2 demonstrated contrast extravasation consistent with a contained staple line leak. Total parenteral nutrition (TPN) was initiated via newly placed peripherally inserted central catheter.

ENDOSCOPIC MANAGEMENT

On HD 2, the patient underwent endoscopic evaluation and washout. There did not appear to be a narrowing at the incisura nor a twist in the sleeve formation. There was a clear staple line disruption at the GE junction, most likely due to a technical failure from stapling too close to the GE junction. Given the lack of technical issues which would require a surgical revision, we elected to place an endoluminal wound vacuum sponge into an approximately 5 cm abscess cavity at the site of staple line dehiscence. The patient was placed on TPN and intravenous fluid support. Serial endoscopic wound vacuum exchanges were performed on HD 7, HD 14, and HD 21, each demonstrating progressive granulation tissue formation and reduction in cavity size [**Figures 2–4].**

On HD 28, an additional wound vacuum exchange revealed a 1.5 × 0.5 cm granulating cavity and the endoluminal wound vac continued to output high volumes of seropurulent material. On HD 35 he underwent upper endoscopy, at that time it was noted that the cavity had resolved and there was a shallow ulcer in its place. Given the dramatic improvement in the appearance of the staple line dehiscence and the fact that the patient was eager to be discharged after a prolonged hospital stay, an esophagogastric stent under fluoroscopic guidance was inserted. This was done to allow the patient to eat and while minimizing the risk of recurrent abscess collection [**Figure 5**]. After stent placement, he was able to tolerate clear and full liquid diets, TPN was discontinued, the peripherally inserted central catheter was removed, and intravenous antibiotic therapy was stopped. He was discharged on a bariatric full liquid diet.

Figure 5. Fluoroscopy showing satisfactory stent placement.

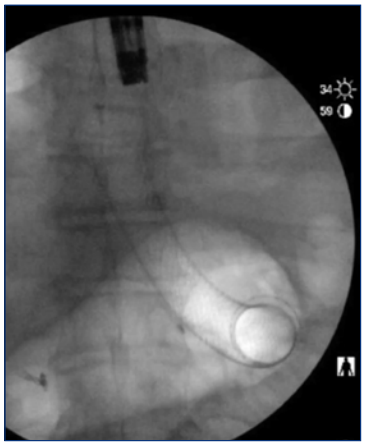


Figure 6. Barium swallow performed after stent removal demonstrating resolution of staple line dehiscence.

Four weeks later, the patient was readmitted for planned stent removal. On stent removal, the previous cavity appeared to have resolved with no further mucosal defect noted. Barium swallow was performed and was without evidence of leak **[Figure 6**]. He was subsequently discharged on a clear liquid diet and gradually advanced his diet to a solid post-bariatric diet. On follow-up months later, he was doing well with no lasting complications.

DISCUSSION

Staple line leaks after sleeve gastrectomy remain a feared complication with incidences reported between 1% and 3%. Early diagnosis with cross-sectional imaging is critical. Management strategies have evolved from open surgical drainage to minimally invasive techniques. This case illustrates the successful use of endoscopic wound vacuum therapy combined with esophagogastric stenting to manage a challenging

proximal staple line leak. These endoscopic interventions, along with others, have been reported as successful strategies for the management of sleeve gastrectomy leaks.[1]

Endoscopic wound vacuum therapy involves placing a sponge connected to a nasogastric tube which is then placed to negative pressure inside the leak cavity. The negative pressure promotes healing through granulation tissue formation and serves as an effective method of source control through removal of wound debris. Endoscopic wound vacuum therapy is highly effective in managing sleeve gastrectomy leaks with success rates ranging between 84–100%.[1,2] However, one drawback is the need for frequent endoscopic sessions during which time the patient is hospitalized. Most centers perform endoluminal vacuum exchanges every three-five days; however, most patients find the frequent sedation very taxing and for this reason our center has extended exchanges to every five-seven days. Additionally, endoluminal wound vac placement does not address anatomical issues with the sleeve itself, which may lead to persistent leak. Narrowing at the incisura or twisting of the sleeve need to be addressed with serial dilations or even a surgical revision in order for endoluminal therapy to be successful.

Endoscopic stent placement with covered self-expanding metal stents is a commonly used method in the management of foregut leaks, including sleeve gastrectomy leaks. The stent acts as a barrier to exclude the leak site, preventing ongoing leaking/contamination. It is imperative to remember endoscopic stents may need to be combined with an additional drainage procedure to obtain adequate source control. Reported success rates are variable between 65–95% with higher success rates noted in leaks recognized earlier.[1,3,4] Endoscopic stents allow early enteral nutrition but have been known to migrate.

Endoscopic internal drainage using a double-pigtail plastic stent is an effective method that drains collections internally into the stomach. Similarly to the endoscopic wound vacuum therapy, internal drainage acts as a method of source control, usually abating the need for other procedures. It has a high success rate of 85% when used as the initial modality and 78% when used as a rescue therapy after other methods have failed.[5] It can be used in delayed presentations/chronic leaks with good efficacy.

Endoscopic clipping with a through-the-scope (TTSC) or over-the-scope (OTSC) method have been described as well. The TTSC are used to close small (<1 cm) defects while the OTSC method can be used on defects up to 3 cm in size. Both TTSC and OTSC have higher success rates when used in early leaks and have an overall successful closure rate of 67%.[6] The efficacy diminishes in chronic or larger defects and, like stenting, may need additional procedures to achieve adequate source control.

Endoscopic suturing and other adjunctive therapies such as fibrin glue/tissue sealants have been used with variable success. Endoscopic suturing alone had a low success rate of 27% in one retrospective review.[7] Furthermore, these methods are more effective with acute, small leaks as outcomes significantly dropped off if suturing was used in delayed leaks (>30 days). The real utility of these adjuncts seems to be in combination with other endoscopic interventions listed previously.

CONCLUSION

This case underscores the role of advanced endoscopic therapies in managing sleeve gastrectomy staple line leaks. Endoscopic wound vacuum systems and esophagogastric stenting can provide effective, minimally invasive alternatives to traditional surgical re-intervention, supporting healing while minimizing morbidity compared to classic surgical revisions.

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Disclosures

Cody Ness has nothing to disclose. Marcoandrea Giorgi serves as a consultant for BD and Intuitive. Andrew Luhrs serves as a consultant for BD, Intuitive, and Medtronic.

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