

Endoscopic Management of Gastro-colic Fistula Following Leak from Laparoscopic Sleeve Gastrectomy

Safi Khuri^{1*}, Yasin Kamel², Kinan Halon¹, Wisam Abboud^{1,3} and Bishara Bishara^{1,3}

¹Department of General Surgery, Rambam Health Campus, Haifa, Israel.

²Department of gastroenterology, invasive unit

³Minimal invasive surgery unit

*Corresponding author

Safi Khuri, Department of General Surgery, Rambam Health Campus, Haifa, Israel, Email: s_khuri@rambam.health.gov.il

Submitted: 30 Aug 2017; Accepted: 05 Sep 2017; Published: 28 Sep 2017

Abstract

Laparoscopic sleeve gastrectomy (LSG) is a restrictive bariatric procedure effective for the management of morbid obesity. Staple line leak is the most feared complication after LSG and can present early or late following operation. Untreated, chronic staple line leak (>12 weeks) can lead to abscess formation, which in turn form a fistulous tract to adjacent epithelial lined structures. Herein, we present a case of gastro-colic fistula following leak from LSG treated at our department.

A 49 years old male patient, presented 14 weeks after LSG to our emergency department with fever and upper abdominal pain. Imaging studies revealed intra-abdominal abscess between the stomach and the spleen with oral contrast leakage into the abscess cavity. An endoscopic evaluation revealed a fistula distal to the gastro-esophageal junction. Endoscopic management of the fistula done by over the scope clip (OTSC), which later failed. The patient re-admitted 12 weeks later and re-imaging studies showed a gastro-colic fistula and distal stenosis of the gastric sleeve.

Endoscopic treatment was completed by OTSC closure of the fistula opening on the stomach side and hem clip closure of the fistula opening on the colon side. Also, fluoroscopically-guided endoscopic balloon dilation was done to treat distal stenosis. At 30 months follow up, the patient is doing well.

Introduction

LSG was introduced as an alternative to duodenal switch procedure in 1990 to decrease complication rate, and is one of the most common restrictive bariatric procedures used for the treatment of morbid obesity [1,2]. It is accepted as a standalone procedure, effective for achieving adequate weight loss and resolution of comorbidities in obese patients [3,4]. Complications following LSG include hemorrhage, staple line leaks, intra-abdominal abscess, stricture formation, gastro-esophageal reflux and spleen associated complications [5]. Staple line leak following LSG is the most feared complication, is usually difficult to treat and need a multimodal approach including surgical, interventional radiology and endoscopic management [6].

Several risk factors implicated in the development of staple line leak, including compromised vascular supply within the cardia region, distal stenosis, delayed gastric emptying, elevated intraluminal pressure and decreased sleeve distension [7]. Other risk factors include hypertension, prior surgery, diabetes mellitus and infection [7,8]. Chronic staple line leak (>12 weeks) can develop into a fistulous tract to adjacent structures, including gastro-colic, gastro-pleural, gastro-bronchial or gastro-splenic fistula [9]. These fistulas are very uncommon, presenting a challenge to the treating physician and usually treated by surgical means.

Here, we report a rare case of gastro-colic fistula following chronic staple line leak from LSG, which treated by endoscopic means.

Case presentation

A 49 years old male patient, with a medical background of hypertension, hyperlipidemia and ischemic heart disease, presented to the emergency department with upper abdominal pain 14 weeks after LSG. The pain was of acute onset and lasted 4 hours. Nausea and vomiting were also reported. On physical examination, he had a pulse of 90 b/min, temperature of 37.1c and blood pressure of 110/70 mmhg. Abdominal exam revealed left upper abdominal tenderness and digital rectal exam was normal. A complete blood count showed leukocytosis of 16000, with 15% bands and hemoglobin level of 12.3 g/dl. Liver and kidney function tests were within normal limits. A computed tomography (CT) scan showed an intra-abdominal abscess of 7.6*9.3 cm between the stomach and the spleen, with leakage of oral contrast into the abscess cavity (**Figure 1**). The patient admitted to the surgical ward for further management of a suspected chronic staple line leak. He was treated by nothing per os (NPO), total parenteral nutrition (TPN), intravenous antibiotics and CT scan guided percutaneous drainage of the abscess. Anesophagogastrroduodenoscopy revealed a small fistulous opening of a 6 mm distal to the gastro-esophageal junction without distal obstruction. Endoscopic treatment of the fistula

was completed with OTSC of 11*14 mm. Upper gastrointestinal (GI) gastrografin study was performed 3 days later, revealing no evidence of a leak from the stomach. The patient began oral feeding and discharged home 12 days following admission. During the upcoming 4 weeks, the patient had a comfortable period, with good tolerance to oral feeding and without secretions within the drain, which removed after 6 weeks from discharge. 12 weeks after the first admission, the patient complained of upper abdominal pain of several days, intolerance to oral feeding and intermittent left shoulder pain. A repeat CT scan revealed intra-abdominal abscess along the staple line. The patient admitted for further treatment and a CT scan guided percutaneous drainage of the abscess done (**Figure 2**). An upper GI gastrografin study showed dilation of the proximal part of the stomach, stenosis of the distal part, delay in oral contrast passage to the duodenum, and a network of fistulas along the greater curvature of the stomach in communication with the transverse colon (**Figure 3,4**). An endoscopic treatment done; by esophagogastroduodenoscopy, a fistulous opening was demonstrated distal to the gastro-esophageal junction, closed by OTSC. The previous OTSC not found. Stenosis at the incisura angularis was also noted, which treated by fluoroscopically-guided endoscopic dilation by a balloon. By colonoscopy; at 50 cm proximal to the anal verge, fistulous opening was revealed and closed by three hem clips. 7 days after endoscopic management, an upper GI gastrografin study revealed no evidence of a leak or a fistulous tract, but a delay in oral contrast passage to the duodenum noted (**Figure 5**). Repeat fluoroscopically-guided endoscopic dilation with a balloon done. The patient proceeds with oral feeding with good tolerance. After 6 weeks on clinical follow-up, imaging studies showed no evidence of leak and percutaneous drain removed.

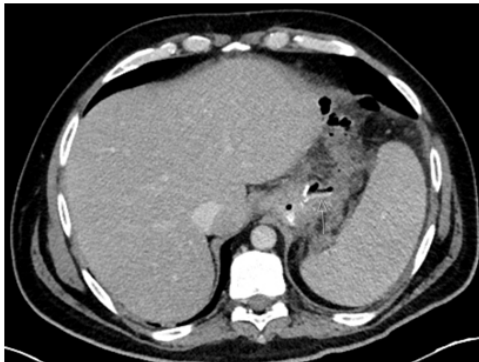


Figure 1: Axial abdominopelvic CT scan revealing intra-abdominal abscess, with contrast leakage to abscess cavity (arrow).



Figure 2: Sagittal abdominopelvic CT scan guided percutaneous drainage of intra-abdominal abscess.

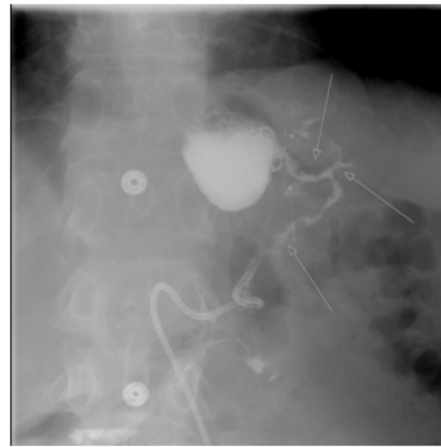


Figure 3: upper GI gastrografin study showed leakage of contrast from the upper part of the stomach with a network of fistulas along the greater curve.



Figure 4: upper GI gastrografin study reveal a communication to the transverse colon with contrast material filling the colon (arrow).



Figure 5: upper GI gastrografin study shows no evidence of contrast leak or fistula tract. Delay in oral contrast passage to the duodenum noted.

At 30 months follow up, the patient is doing well, with good tolerance to oral feeding and without any complaints.

Discussion

Complications following LSG are usually classified as acute (with in 2 weeks), including staple line leak, intra-abdominal abscess and bleeding, and late (>2 weeks), including stricture formation, gastro-

esophageal reflux, nutritional deficiencies and staple line leak [9]. Of the aforementioned complications, staple line leak is the most dreaded one, with reported incidence of 1-7%, with increasing incidence in revisional cases. Staple line leaks are usually categorized as acute (within 7 days), early (within 1-6 weeks), late (6-12 weeks) and chronic (after 12 weeks) following the initial operation [10-11].

Untreated, staple line leak can become chronic, leading to abscess formation, which in turn form a fistulous tract to adjacent epithelial lined structures, such as the pleura (gastro-pleural fistula), colon (gastro-colic fistula) or skin (gastro-cutaneous fistula). Staple line

leak usually progress to fistula formation after 12 weeks. Gastro-colic fistula is a very rare complication following leak from LSG, usually treated by surgical means, including resection of the fistula tract along with a healthy margin of adjacent tissues [12]. Reviewing the English literature revealed only four reported cases of gastro-colic fistula after leak from LSG, and all treated by surgical means; three cases involve resection of the fistula tract along healthy margin of adjacent tissues and one case involve resection of the fistula tract along subtotal gastrectomy and subtotal colectomy (**Table 1**). We report the fifth case of gastro-colic fistula as a complication after LSG, and the first case that treated by endoscopic means.

Table 1: reported cases of gastro-colic fistula after leak from LSG

Case (reference)	Age (years)	Sex	Time of post-operative diagnosis	Management
Trelles <i>et al.</i>	-----	-----	-----	Failed endoscopic management by stent Surgical resection of the fistula
Bhasker <i>et al.</i>	27	female	1.5 years	Surgical resection of the fistula
Nguyen <i>et al.</i>	21	male	6 months	Surgical resection of the fistula, subtotal gastrectomy, subtotal colectomy
Garofalo <i>et al.</i>	43	female	4 years	Surgical resection of the fistula, omental interposition
Khuri <i>et al.</i> (current case)	49	male	6 months	Endoscopic treatment

Conclusion

Gastro-colic fistula following chronic leak from LSG is a very rare, yet known complication. Management should be individualized for each patient. If feasible, endoscopic approach as a first line treatment can be attempted before subjecting the patient to surgical intervention. Distal stenosis should be treated before attempting endoscopic management.

References

1. Frezza EE (2007) Laparoscopic vertical sleeve gastrectomy for morbid obesity. The future procedure of choice? *Surg Today* 37: 275-281.
2. Marceau P, Hould FS, Simard S, Lebel S, Bourque RA, et al. (1998) biliopancreatic diversion with duodenal switch. *World J Surg* 22: 947-954.
3. Lalor PF, Tucker ON, Szomstein S, Rosenthal RJ (2008) Complications after laparoscopic sleeve gastrectomy. *Surg Obes Relat Dis* 4: 33.
4. Hutter MM, Schirmer BD, Jones DB, Ko CY, Cohen ME, et al. (2011) First report from the American College of Surgeons Bariatric Surgery Center Network: laparoscopic sleeve gastrectomy has morbidity and effectiveness positioned between the band and the bypass. *Ann Surg* 254: 410-420. Discussion 420-422.
5. Miguel E, Cervera-Hernandez, Dieter Poh (2017) Splenic abscess caused by streptococcus anginosus following laparoscopic sleeve gastrectomy (LSG): a case report of a rare complication

- of bariatric surgery. *Journal of surgical case reports* 4: 1-3.
6. Garofalo F, Studer A, Atlas H, Radu Pescarus, (2016) laparoscopic treatment of gastro-colic fistula: Are complication of sleeve gastrectomy. *Surgery for Obesity and Related Diseases* 12: 1761-1763.
7. Perez M, Brunaud L, Kedaifa S, Guillotin C, Gerardin A, et al. (2014) Does anatomy explains the origin of a leak after sleeve gastrectomy? *Obes Surg* 24: 1717-1723.
8. Fernandez AZ, DeMaria EJ, Tichansky DS, Kellum JM, Wolfe LG, et al. (2004) Experience with over 3000 open and laparoscopic bariatric procedures: multivariate analysis of factors related to leak and resultant mortality. *Surg Endosc* 18: 193-197.
9. Nguyen D, Dip F, hendricks L, Emanuele Lo Menzo, Samuel Szomstein, et al. (2016) the surgical management of complex fistulas after sleeve gastrectomy. *OBES SURG* 26: 245-250.
10. Deitel M, Gagner M, Erickson AL, Crosby RD (2011) Third International Summit: Current status of sleeve gastrectomy. *Surg Obes Relat Dis* 7: 749-759.
11. Rosenthal RJ, Diaz AA, Arvidsson D, Baker RS, Basso N, et al. (2011) International Sleeve Gastrectomy Expert Panel Consensus Statement: best practice guidelines based on experience of >12,000 cases. *Surg ObeS Relat Dis* 8: 8-19.
12. Aydin U, Yazici P, Ozutemiz O (2008) Outcomes in the management of gastrocolic fistulas; a single unit's experience. *Turk J Gastroenterol* 19: 152-157.

Copyright: ©2017 Safi Khuri. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.