Lower Esophageal Perforation by Drainage Tube Masquerading as Staple Line Leak after Laparoscopic Sleeve Gastrectomy

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Abstract

Laparoscopic sleeve gastrectomy is increasingly being recognised as a valid stand-alone procedure for the surgical management of morbid obesity. However, utility of drain placement in laparoscopic sleeve gastrectomy remains controversial. We report our experience of unexpected esophageal perforation caused by drainage tube in a 45 yr old female with a BMI of 49 kg/m^2 who underwent laparoscopic sleeve gastrectomy at our institute. This unusual complication, in our opinion, has not been reported anywhere in literature.

Keywords: Gastrectomy; Laparoscopic sleeve gastrectomy; Esophageal Perforation.

Introduction

Laparoscopic sleeve gastrectomy(LSG) can be a first-step procedure before gastric bypass or duodenal switch, or a single stage restrictive procedure if long-term results are good [1]. Studies report weight loss after LSG ranging from 35% to 72% of excess weight loss at 12 months [2].

Surgical complications in bariatric patients are usually difficult to interpret. Clinical signs are often silent and sometimes the only alarming sign of a possible complication is low grade fever or tachycardia. That is why many surgeons insist in the use of drains, believing that they can provide more safety in thepostoperative care of these patients, even though the utility of drain placement in general surgery and in bariatric patients in particular remains controversial [3]. We, at our institute, are routinely using drains in laparoscopic sleeve gastrectomy becausewe feel that they can be helpful in early detection of intraperitoneal bleeding.

We present an interesting case of lower esophageal perforation by drainage tube masquerading as staple line leak after laparoscopic sleeve gastrectomy.

Case Report

A 45-year-old female patient was referred to the metabolic and bariatric surgery clinic at our institute which is a large tertiary care teaching hospital in New Delhi, India. The patient was morbidly obese with estimated body mass index of 49 kg/m^2, and had comorbidities including type 2 diabetes and hypertension. Patient underwent laparoscopic cholecystectomy 8 years back. Preoperative investigations including upper GI endoscopy were within normal limits. A laparoscopic sleeve gastrectomy was scheduled after pre-operative optimization of patient's medical comorbidities.

The patient was operated under general anaesthesia and pneumoperitoneum was created using a veress needle. Access into peritoneal cavity was gained using an Optiview trocar® (Ethicon Endo-Surgery Inc., Johnson & Johnson, Ohio, USA). A total of five-trocars were used (three 12mm and two 5mm trocars), and a sleeve was fashioned over a 36Fr bougie using a 60mm Echelon Endopath®linear cutter (Ethicon Endo-Surgery Inc., Johnson & Johnson, Ohio, USA)using the standard method. An intraoperative leak test was performed at the end of

the procedure by insufflating air into the stomach and instilling saline in the peritoneal cavity. A 28 Fr abdominal drain (made of polyvinyl chloride) was placed in the perigastric region and brought out through the left lumbar port.

Post operatively, on the evening of surgery, a note was made of approximately 300 ml of blood in the abdominal drain. The vitals remained stableand the abdomen wassoft and nontender. By the next morning however, the pulse rate increased to 100 per min with a total drain output of 500ml post surgery. The blood pressure remained stablebut there was a drop in Haemoglobin of 2 gm% from the preoperative value. A decision was made to perform a CECT of abdomen which revealed a large paragastric hematoma measuring 9 x 10 cm along the greater curvature of stomach with no obvious leakage of gastric contrast Figure 1.

The patientwas transfused 3 units of packed red cells and was put on conservative management with intensive monitoring. Oral intakewith stage 1 liquid diet was started on post-operative day 3. The daily drain output gradually decreased to 100-150 ml of serosanguinous fluid by the end of 1st week. The patient remained stable and was discharged on day 8 with abdominal drain in situ.

The patient presented to the emergency 2 days later with complaints of passage of ingested liquids through the abdominal drain, and was readmitted.The patient was started on IV fluids and all oral intake was stopped. A Gastrograffin swallow revealed contrast spill near gastroesophageal junction(Figure 2). A nasojejunal tube was inserted under fluoroscopic guidance and patient was started on enteral nutrition through 1000 Kcal nasojejunal tube feeds(Figure 3). The patient was discharged after a week with both the abdominal drain and the nasojejunal tube in situ. The drain output decreased to about 10-20 ml of cloudy fluid per day. The abdominal drain was accidentally pulled out at around 12 weeks post operatively and a 16 Fr Foley's catheter was introduced through the drain tract. A repeat Gastrograffin study at 16 weeks revealed a persistent leak from the same site.

After 20 weeks of conservative management, when the leak failed to settle, an upper GI endoscopy was performed. It revealed a 10 x 6 mm chronic perforation of the lower esophagus, 1 cm proximal to gastroesophageal junction. The tip of the Foley's catheter was seen through the perforation in the esophagus(Figure 4,5). Under direct endoscopic vision, the catheter tip was withdrawn and the mucosa around the perforation was apposed using 3 endoclips (Triclip, Cook Medical Inc, USA) (Figure 6). The output through the Foley's catheter ceased within 3 days. A negative leak was confirmed by subsequent Gastrograffin study performed after a week of endoscopic intervention (Figure 7). A second look endoscopy performed after 2 weeks from the first one showed complete healing of esophageal perforation (Figure 8). The Foley's catheter was then removed. Patient was started on oral feeds after 3 weeks which were well tolerated. Patient was discharged and is in regular follow up with current BMI of 32 and remains asymptomatic.

Fig. 1:

Fig. 2:

Fig. 3:

Fig. 4:

Fig. 5:

Fig. 6:

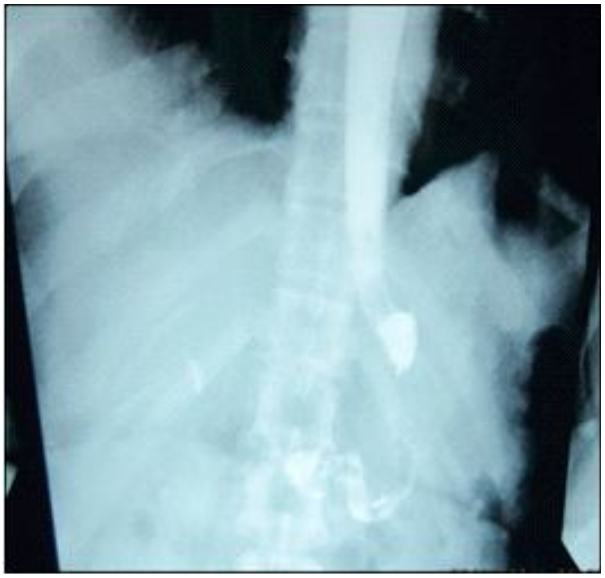

Fig. 7:

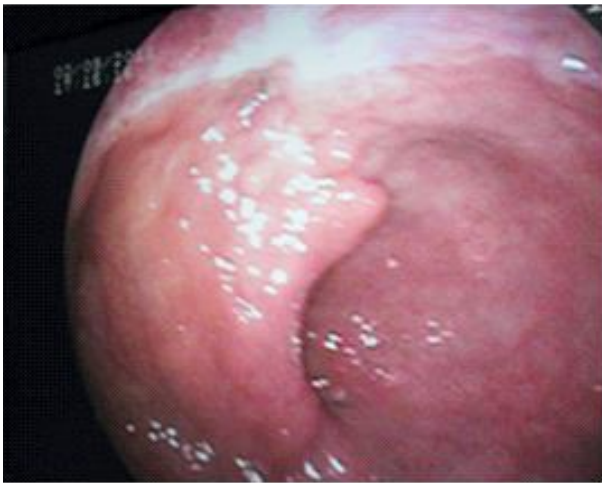

Fig. 8:

Discussion

The use of abdominal drain was first reported by Hippocrates in the case of gall bladder empyema [4] and later by Celsus in the management of ascites [5]. Abdominal drains have been classified into open and closed drain systems. Open drain includes corrugated rubber or plastic sheets and the drained fluid gets collected in stomal bag or gauze dressing. Thus, the risk of infection is increased. Close drain consists of tubes draining in a bag or bottle reducing the risk of infection. Based upon the mode of function, they are also classified as active and passive drains. Active drains are maintained under suction, which may be high or low. Passive drains have no suction and function by differential pressure between body cavity and exterior and by gravity [6,7].

Bowel erosion by abdominal drain is rare. The duration of placement of drain contributes to bowel erosion. Both open as well as closed suction drains have been reported to cause erosion. The mechanism of erosion in both the groups are postulated to be different. The open drains erode the bowel due to pressure necrosis by tip whereas closed suction drains cause drawing of bowel into side holes due to creation of high negative pressure (which can reach up to -180 mmHg) causing erosion of the wall [8].

Direct perforation of bowel due to blind placement of drains has also been reported [9]. Erosion of drain into bowel may present as either localized or generalized peritonitis. An enterocutaneous fistula with drainage of the enteric contents through the drain may lead to the diagnosis of this condition. Imaging in the form of fistulogram through the drain may show passage of the contrast medium into the bowel. Contrast-enhanced computed tomography may also help in diagnosing this erosion.

The index case had an intraperitoneal bleed with formation of peri gastric hematoma in the postoperative period. The most likely source of this was the gastric staple line. Staple line bleed after LSG is a well recognized complication, and most of the patients with small hematomas respond to conservative management. We discharged this patient with abdominal drain in situ as we expected the hematoma to get lysed and resolve on conservative management. However, the readmission of the patient with complaints of passage of ingested liquids through the abdominal drain was suggestive of staple line leak. The Gastrograffin study also confirmed the clinical diagnosis as contrast spill was seen near the gastroesophageal junction. This site has been reported to be one of the most common sites of staple line leak.

As the patient was clinically stable with no signs of peritonitis or sepsis, the patient was managed conservatively [10]. Conservative management may be indicated in cases with localized peritonitis or low output enterocutaneous fistula. Patients with general peritonitis or having high drainage output require re-exploration.

Despite conservative management for 20 weeks, the seropurulent discharge persisted. An upper GI endoscopy was therefore done to identify the site of leak. It unexpectedly revealed a lower esophageal perforation near the gastro-esophageal junction, with fibrosed margins and Foley's catheter tip projecting into the esophageal lumen. A diagnosis of esophageal perforation due to erosion by the abdominal drain was made. The complication could have been precipitated by suture line bleed with hematoma formation and possible secondary infection followed by pressure necrosis of lower esophagus wall by drain tip.

After discussion with the gastroenterologist, endoscopic clipping of the perforation was performed. The option of esophageal stenting was not considered feasible in view of distal location of perforation near the gastro-esophageal junction, as stenting would have caused significant gastro esophageal reflux.

A wide search of published literature was performed to search for such a complication after LSG. To our knowledge a similar complication after LSG has not been reported earlier. Recently, endoscopic clipping for small esophageal perforations has been reported in some case reports [11]. Evidence of the effectiveness of clips for the endoscopic closure of both acute and chronic perforations of esophagus is growing [11].

The authors believe that in order to avoid bowel erosion, soft drains like Jackson Pratt drains are preferable over the stiffer PVC drains. Moreover, the drains should be utilized only when necessary and removed as early as possible. Confirmation of the final tip position of drain by direct visualization before complete desufflation of abdominal cavity may also prove to be of help.

In the hindsight, we believe that an early upper GI endoscopy could have significantly shortened the postopeartive course and morbidity of in this patient. Direct visualization and closure through upper GI endoscopy has a significant role in management of gastroesophageal leaks. Although rare, possibility of drain erosion into lower esophagus and/or stomach should be suspected in patients presenting with features of post-operative staple line leak after LSG.

Conclusion

Early upper GI endoscopy has a significant role in management of gastroesophageal leaks along with nasojejunal tube feedings. Endoscopic treatment of mature esophageal perforation with metallic clips can be performed to promote closure. In combination with other conservative medical efforts, this method can be used safely and effectively for selected patients.

References

1. Mognol P, Chosidow D.Laparoscopic Sleeve Gastrectomy (LSG): review of a new bariatric procedure and initial results. SurgTechnol Int. 2006; 15: 47-52.
2. Fuks D, Verhaeghe P, Brehant O. Results of laparoscopic sleeve gastrectomy: a prospective study in 135 patients with morbid obesity. Surgery. 2009; 145(1): 106–13.
3. Dallal RM, Bailey L, Nahmias N. Back to basics-clinical diagnosis in bariatric surgery. Routine drains and upper GI series areunnecessary. SurgEndosc. 2007; 21: 2268–71.

4. Hippocrates. The genuine work of Hippocrates, translated from the greek with a preliminary discourseand annotation by Francis Adam. London. Printed for the syndemham society. 1849; 1: 88.
5. Celsus AS De Medicina, Book VII, Chap XV with an English translation by G F Collier MD 3rd edition London, Red Lion Court, Fleet street Sold by Longman and company, Whittaker and company and Simpkin and Marshall. 1838; pp292.
6. Memon MA, Memon MI, Donohue JH; Abdominal drains: A brief historical review. Ir Med J. 2001; 94: 164-166.
7. SK Sahu et al Drain erosion into bowel; An unusual complication.The internet journal of surgery. 2008; 16(2).
8. Graham D, Coit D, Brennan MF: Perforation of the bowel by suction drains. Br J Surg. 1993; 80: 128-129.
9. Pankaj Srivastava, Shalinisrivastava, Manoranjan Sahu. Iatrogenic bowel perforation secondary to surgical drain after cholecystectomy; a case report with review of literature. The Internet Journal of Surgery. 2007; 13(1).
10. Chen B, Kiriakopoulos A, Tsakayannis D. Reinforcement does not necessarily reduce the rate of staple line leaks after sleeve gastrectomy: a review of the literature and clinical experiences. Obes Surg. 2009; 19: 166–172.
11. Qadeer MA, Dumot JA, Vargo JJ, Lopez AR. Endoscopic clips for esophageal perforations: case report and pooled analysis. GastrointestEndosc. 2007 Sep; 66(3): 605-11.