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Management of Esophago-Gastric Anastomotic Leak with Endoscopic Vacuum Therapy- A Case Report and Review of Literature

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ABSTRACT

Transmural defects of the upper gastrointestinal (UGI) tract can be either leaks, perforations or fistulae. Endoscopic vac is a good option for management for localized leaks where stent placement is not feasible. We present a case of a 31-year-old lady who was operated for strangulated Bochdalek hernia with partial gastrectomy with esophago-gastric anastomosis. She then underwent 2 sittings of endo vac placement for management of an anastomotic leak with mediastinitis. She was followed up on outpatient basis with imaging and interval endoscopies. Post 6 months of the procedure, patient is well and is on full oral feeds.

Keywords

Endovac therapy, Esophago-gastric anastomosis, Leak, Strangulated Bochdalek hernia.

Introduction

Oesophageal perforations and anastomotic site leaks are associated with high mortality and morbidity [1]. The percentage of mortality is 20 % in conservatively managed and 64 % in surgically managed leaks [2]. To avoid repeated surgical intervention, self-expanding metallic stent (SEMS) and plastic stents have paved a way for managing such leaks, but with complications of decreased food intake, stent migration to name a few [3]. Since 2006, a new treatment has been available, in the form of endoscopically placed vacuum sponge therapy. The technique was first used in patients with pararectal abscesses due to anastomotic leaks after rectal surgery. It involves placing an open-core sponge in the abscess cavity, connected to a drainage tube with a negative-pressure pump. In the last few years this approach has also been used in the upper gastrointestinal tract and it is used as an alternative in the treatment of patients with UGI perforations or leaks.

Case Report

A 31-year-old female patient presented with complaints of epigastric abdominal pain, nausea, vomiting and breathlessness for 24 hours with pain getting aggravated in supine position. Pt was tachycardic and tachypnoeic with a respiratory rate of 30cycles /min. Her white blood cell (WBC) counts were raised (18,000).X-Ray showed a massive air fluid level in the left pleural cavity with marked mediastinal shift to the right (Fig 1-c). Computed Tomography (CT) Scan chest showed massive left Bochdalek hernia with compete migration of stomach into the left pleural space with ischaemia (Figures 1-a,1-b) and oedematous pancreas. Intra-operatively, after bringing down the stomach, its proximal half was noticed to have become gangrenous with perforation (Fig 2). Upper partial gastrectomy was performed and esophago-gastric anastomosis was done using interrupted 2-0 PDS sutures. The remnant stomach was oedematous and ischaemic but not frankly gangrenous. Post-surgery, on POD-2, her heart rate-110, respiratory rate-28cycles/min, total counts-27,000. CT scan with intravenous contrast done 48 hours later showed severely ischaemic stomach with doubt about its viability. At relook laparotomy done to assess the stomach remnant showed severe oedema but viable. The anastomotic site was healthy.

On the 12th postoperative day, a check oral contrast study showed frank leak from the anastomosis resulting in left infra diaphragmatic infected collection tracking up to left perinephric space with endoscopy confirming the findings (Figures 3-a,3-b).

This was percutaneously drained with 14 French pigtail catheter.

The patient remained in severe systemic inflammatory response (SIRS) with high fever, high pulse rate, high WBC (45000) and raised C-reactive protein (CRP) above 350 grams.

At this stage, the options for management were debatable. Covered stent and re surgery were considered hazardous. Under these circumstances, endoscopic vacuum (Endovac) therapy was considered a safe option.

UGI endoscopy done to set up endovac, showed partial breakdown of the anastomosis with defect size 3cms and a subdiaphragmatic cavity with slough. The cavity was entered with scope de-sloughing was done using brush and Roth net. The cavity was irrigated with normal saline.

Endovac device was made using vacuum therapy sponge of suitable size. This was wrapped around the tip of Ryle's tube (RT) incorporating all the apertures using Ethilon sutures after passing the RT through nose and bringing it out through mouth (Figure 4-a). This sponge along with the RT was negotiated into the cavity and a part of the sponge was allowed to remain in the oesophageal lumen (Figure 4-b). Another sponge of suitable size was fixed by blocking the cavity at the distal end of RT and placed at the right shoulder (Figures 4-c, 4-d). The RT was connected to endovac therapy unit and the pressure set at 120mm of Hg. Forty-eight hours after starting endovac therapy, there was a marked reduction in SIRS response indicated by fever, pulse rate, WBC count and CRP showing significant downward trend. Endovac was repeated twice further at intervals of 5 days each. The total duration of therapy was 2 weeks. At each session of endoscopy, there was reduction in the size of the sponge used and considerable improvement in terms of size of the cavity and amount of slough (Figure 5).

CT oral contrast study after 2 weeks of endovac therapy showed marked reduction of cavity with well-formed fistula which healed in about 8 weeks.

Check endoscopies were done at 3 months and 6 months. Both were normal and at present , patient is on full oral diet.

Figure **1a** showing chest x ray showing left hemithorax with air-fluid level and **1b**, **1c** showing CT image of bochdalek hernia with stomach as content in the left hemithorax.

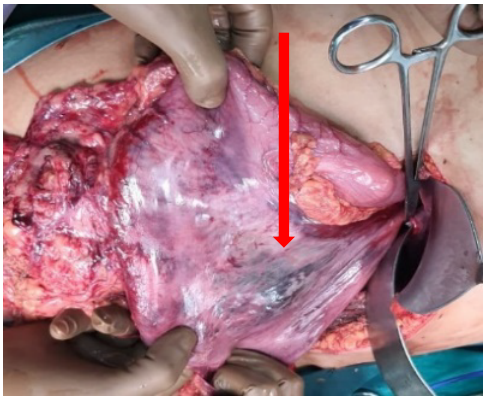

Figure 2: Showing intra-operative picture of patchy gangrenous stomach.

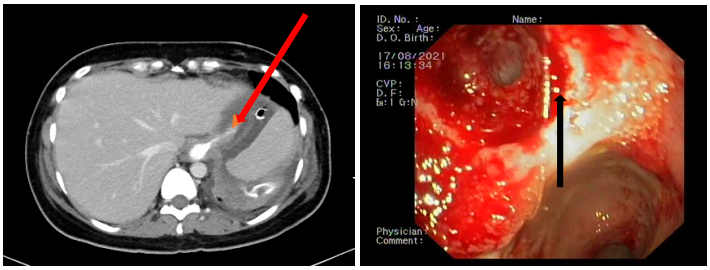

Figure 3a: Showing leak of oral contrast on CT image. **Figure 3b:** Showing endoscopic image of dehiscence at the esophago-gastric anastomosis.

Figures **4a,4b,4c,4d** showing endovac therapy using Ryle's tube with negative suction applied at shoulder.

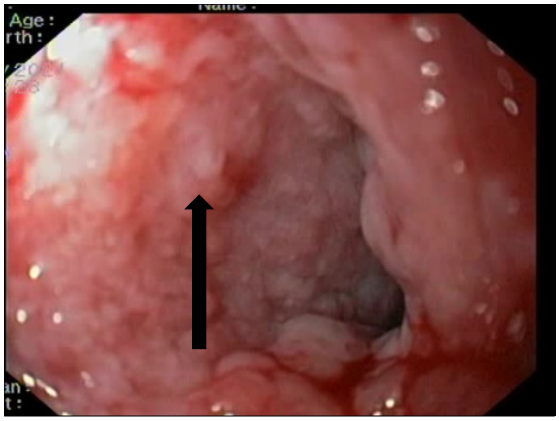

Figure 5: Showing granulation tissue after endovac therapy.

Discussion

Oesophageal leaks occur in up to 35 % of esophagectomies. The mortality from esophagectomy is up to 15 %, of which 40 % is from oesophageal leaks [4].

The treatment options include surgical repair, endoscopic stents, endoscopic clips, glue, and Endovac therapy. Surgical repair is indicated in unstable patients. Stable patients are often managed by endoscopic stenting. Stent migration occurs in 6–35%, more commonly with plastic stents [5]. OTSC is a new clipping device for closure of any gastrointestinal leak after endoscopic or surgical procedures and is gaining popularity as one of the treatment options for leaks /fistula, although presence of nonviable tissue around the defect margin, especially in cases detected late, and the tip alignment required are few limitations [6-8].

Mennigen et al. found that Endovac therapy had a success rate of 86.4 % while that of stent therapy was 60.9 %. The average duration of stenting was 36 days and that of Endovac therapy was 26.5 [4].

The shape of the anastomosis and the ability of the stent to conform to the defect may create limitations for successful stenting. Complex leaks may respond better to Endovac therapy. Gubler et al. described a technique of stenting combined with Endovac therapy for complex leaks [9].

Predictors of success with stenting are early stenting, and smaller defects. Anastomotic leaks located in the cervical oesophagus or near the gastroesophageal junction or in the distal conduit, and size of the defect greater than 6 cm are predictors of poor response to stenting. The stricture rate with stents is higher than with Endovac therapy (28.2 vs 9.4 %) [10].

Imaging is recommended prior to Endovac therapy to assess the proximity of the cavity to important vascular structures and to prevent fatal haemorrhage. Contraindications to Endovac therapy are massive defects, loculated cavities, cavities of complex shape, fistulas to skin or body cavities (which do not hold suction), and wide dehiscence of a surgical anastomosis or necrosis of the conduit.

Recently there have been a fair number of studies that have looked at Endovac for transmural defects of the UGI [11,12].

The principle of EVT is the same as the closure treatment for chronic wounds. In EVT, a polyurethane sponge is kept on the defect to apply negative pressure. Healing is achieved through continuous abscess drainage, reducing bacterial load, increasing vascularity and [13,14]. An internal vacuum sponge (endo-SPONGE) device was first successfully used for treating a UGI anastomosis leak in 2008. Following which, the use of Endovac for UGI defects has shown good short- and long-term results. Endovac therapy of postoperative leaks in the UGI tract following bariatric surgery has been shown to be feasible and safe. It combines defect closure and effective drainage and allows a periodic inspection of the wound cavity. Endovac therapy has the potential to succeed as a nonsurgical, feasible, safe, and effective treatment option for postoperative leaks in bariatric surgery [15,16].

Endovac therapy was used for rectal anastomotic leak with a success rate of 90% in 20 patients, the leak being extra-peritoneal, with no diversion with regard to sepsis control, granulation of leak cavity and stoma free survival. Balloon dilatation for luminal stenosis was required in 2 patients [17].

A recent meta-analysis was suggestive that Endovac therapy could be an effective and safe treatment method for leaks and fistulae as well as perforations in the UGI. In addition, Endovac therapy may be a better treatment option than SEMS placement for UGI defects [18].

Conclusion

Endo vac therapy is a safe and feasible option for managing transmural defects of the upper gastrointestinal tract and should be kept in the armamentarium of both surgeons and gastroenterologists. It is useful to reduce both the morbidity and mortality and helps in reducing repeated surgical interventions.

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