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Recurrent oesophageal perforation treated with endoluminal vacuum suction drain without a sponge

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ABSTRACT

Esophageal perforations (Boerhaave's syndrome) are uncommon and potentially life-threatening conditions, while recurrent esophageal perforations are extremely rare. Esophageal perforations are generally managed surgically with Kehr's T-tube and drains or primary surgical repair. We present a patient with recurrent esophageal perforation due to Barrett's esophageal ulcer. He was successfully managed with an endoluminal vacuum suction drain without a sponge.

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Introduction

Perforation of the esophagus [Boerhaave's Syndrome] is a serious and challenging clinical emergency [1]. Ninety-day mortality in a cohort of over 2500 patients was 40% [2]. In addition, recurrent esophageal perforation is extremely rare. For both primary and recurrent esophageal perforation, patients are generally treated by Kehr's T-tubes and drainage, primary surgical repair or esophageal stenting. We report a case of a recurrent esophageal perforation treated successfully with endoscopically placed vacuum suction drain without a sponge.

Case report

A 50-year old man with a history of learning disability, multiple sclerosis, psoriasis, and cannabis abuse presented with anterior esophageal perforation. He had a left thoracotomy and repair by closure of the esophagus over a Kehr's T-tube. The patient made a full recovery and two months later his venting gastrostomy, feeding tube and T-tube were removed. He was advised to continue long term high dose proton pump inhibitors [PPI] orally .

Eighteen months later he re-presented with a computed tomography [CT] of the chest proven recurrent esophageal perforation, left thoracic empyema which extended into the mediastinum, [Figure 1, A] and a left apical pneumothorax [Figure 1, B]. With his significant past medical history and the current malnourished status, he was deemed not fit for surgery or admission to critical care unit. Therefore, it was decided to attempt a less invasive approach by an endoscopically placed endoluminal vacuum suction drainage of the empyema under local anesthetic and intravenous sedation [Midazolam and Fentanyl]. The esophagogastroduodenoscopy [EGD] showed a 1 cm perforation on the anterior wall of the esophagus at 36 cm [Figure 1, C] and a healing esophageal ulcer at 31 cm from the upper incisors. First, a percutaneous endoscopic gastrostomy was placed as a venting endoscopic gastrostomy [PEG; ENTRALTM, Maxter Catheters, Marseille]. Next, we used an ExudrainTM [FG 18 with trocar, Wellspect HealthCare, Sweden] as the EndoVac to treat the esophageal perforation. The metal trocar was removed from the drain and the length of the distal drain tip was cut according to the maximum diameter of the empyema cavity, as measured on the CT scan. The aim was to ensure that all the drain-holes were sitting within the empyema cavity. A suture [size silk 1] was tied at the distal end of the drain, and another suture was tied at the proximal part of the drain-holes. The braided knots on the sutures enabled grabbing, manipulation and adequate positioning of the drain tip with an endoscopic biopsy forceps [Figure 1, D]. The Exudrain was inserted through a nostril into the nasopharynx and pulled out through the mouth with a pair of Magill forceps under direct vision with a laryngoscope. The Exudrain was then pulled down into the esophagus with the help of a biopsy forcep grabbing the braided knot of the silk suture at the tip of the drain. Then the drain was pulled through the hole in the distal esophagus [together with the scope] and into the left thoracic empyema cavity. After positioning the tip of the drain to the lateral wall of the cavity, the endoscope was carefully withdrawn into the esophageal lumen while ensuring the proximal drain-holes of the drain were laying within the cavity; the proximal silk suture can be grabbed to push the drain further into the cavity. A continuous wall suction pressure of -100 mmHg was instituted via the drain. A nasal bridle [AMT Bridle System] was inserted, and the drain was sutured to the bridle with a size 0 silk suture. The patient was kept nil by mouth for 72 hours, and then allowed to drink 30 milliliters clear fluids per hour. He was given parenteral nutrition initially, intravenous broad-spectrum antibiotic [Tazocin] and antifungal [Fluconazole] treatment for 10 days, intravenous fluid resuscitation and high dose orodispersible PPI. The apical pneumothorax was treated with a 12 Ch Seldinger chest drain, which was removed after

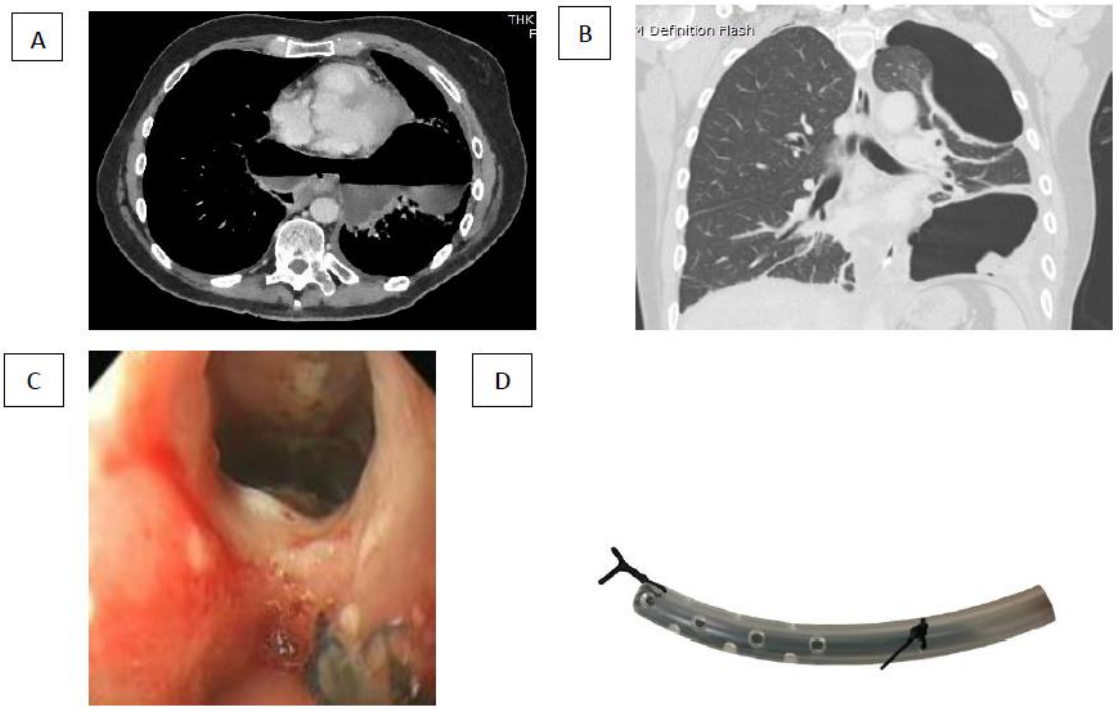

Figure 1 Computed tomographic views of the chest on admission shows an anterior esophageal perforation in combination with bilateral empyema [A] and a left sided pneumothorax [B]. OGD showed an anterior perforation [C] for which a modified EXU drain [Wellspect HealthCare] was positioned in the thoracic cavity through the defect [D].

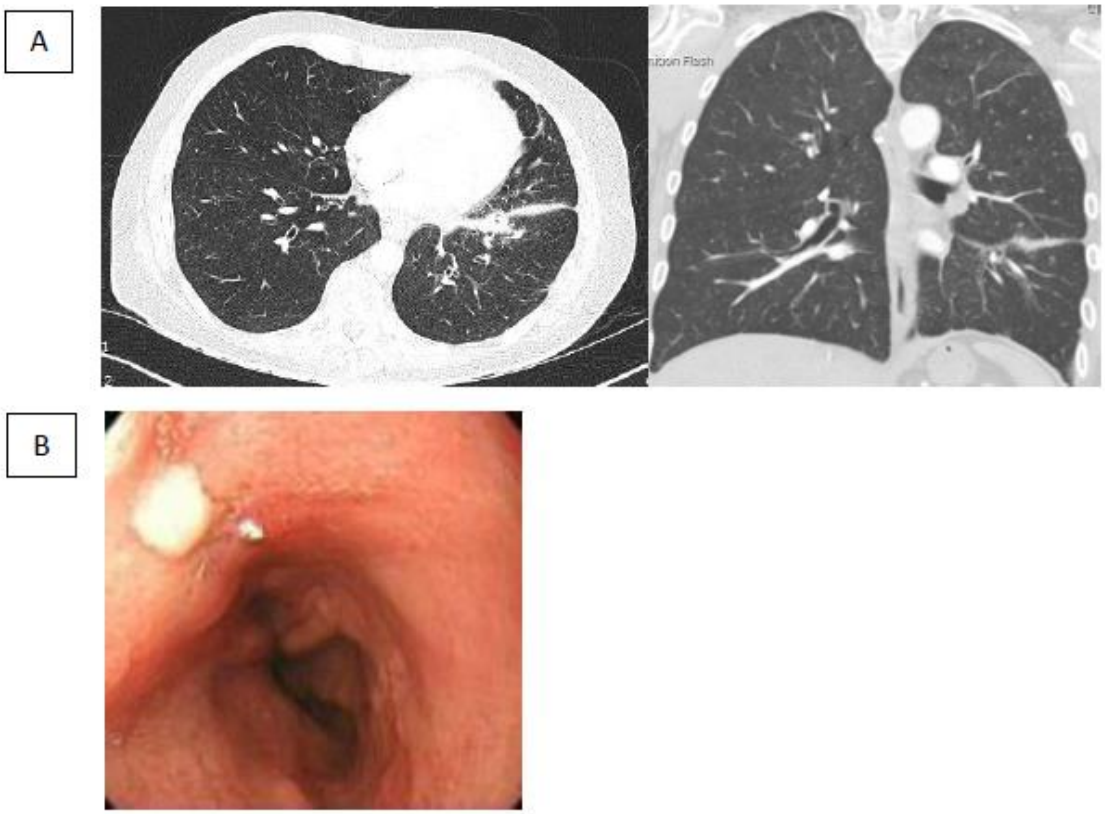

Figure 2 Computed tomographic views of the chest 2 weeks after admission shows the drain which resulted in a remarkably reduction of the empyema [A]. One week after removal of the drain an OGD showed a scar with fibrosis at the position of the earlier defect [B].

2 days. He developed atrial fibrillation post insertion of the endovac, which was successfully treated with intravenous amiodarone. A chest x-ray performed post procedure confirmed the adequate position of the drains and the pneumothorax had resolved completely. Two days later, he had a repeat EGD to insert a duodenal extension through the PEG for enteral feeding. The drain was re-sutured to the bridle and suction was restarted at -100 mmHg. We flushed the Exudrain twice daily with 20 mls water to prevent blockage of the tube.

The patient made a steady recovery on the ward and a CT scan performed 9 days after admission showed almost complete resolution of the empyema cavity. Every week, a chest x-ray was performed to monitor the position of the Exudrain, then vacuum suction was stopped and the Exudrain was pulled back 5 cm. The Exudrain was secured to the bridle again. Hence, this procedure was easily performed on the ward with minimal discomfort. The final position of the drain tip was monitored by a post procedure chest x-ray.

After 4 weeks, the drain was removed completely under endoscopic vision and a minimal defect anterior was seen. The CT scan showed complete resolution of the empyema [Figure 2, A]. An repeat EGD one week later showed ulcer healing with healthy granulation tissue of the esophagus [Figure 2, B]. His oral intake was built up to soft diet and his feeding tube was removed. He was subsequently discharged and re-advised to continue on high dose PPI twice-daily for life.

Discussion

Both primary and recurrent esophageal perforations are complex entities. Possible causes for recurrent esophageal perforations include chronic gastroesophageal reflux with recurrent ulcers, and barotrauma due to excessive vomiting. In general, three treatment strategies can be performed for these cases; surgical, endoscopic, or conservative treatment. Surgery has been the standard treatment for an esophageal perforation. In recent decades, endoscopic treatment of an esophageal perforation has been gaining popularity. Siersema et al treated esophageal perforations patients with a covered stent [5]. When a stent is used, it is important to drain the empyema of the chest adequately. Recently, endoscopic vacuum drainage system to drain a cavity emerged as potential treatment. This technique was initially used for treatment of anastomotic leakages following an esophagectomy [6]. This endoscopic vacuum technique has also been used successfully for a spontaneous esophageal perforation [7]. Our technique differs slightly from the description by Loske and colleagues, in which an endoscopic vacuum sponge system attached to the tip of the suction drain was used [7]. This requires more frequent endoscopy procedures to change the vacuum system every three or four days as the sponge might get incorporated into the wall of the abscess cavity if not changed frequently. Often these changes have to be done under general anesthetic or intravenous sedation. In contrast, our technique in which the drain can be easily pulled back at the bedside is less demanding for the patient, surgeon, and health care system. In addition, we have demonstrated that endoscopic suction therapy is effective, even in a patient with a recurrent esophageal perforation accompanied by a large thoracic empyema and sepsis. This technique worked well for the patient who had adhesions within the left chest from the previous perforation and thoracotomy; these alone would have made re-thoracotomy unsuitable for this patient. In addition, the adhesions within the chest would have limited the extent of the empyema cavity, making it more suitable for endovac therapy.

In conclusion, we report a successful treatment of a recurrent esophageal perforation with a trans-nasal endoscopic vacuum suction drain. This technique can provide a safer alternative treatment compared to re-thoracotomy in a high risk surgical patient.

Acknowledgements

None

Disclosures

None

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