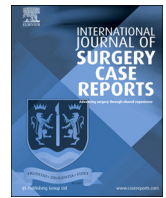




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Success of endoscopic vacuum therapy for persistent anastomotic leak after esophagectomy – A case report

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ABSTRACT

INTRODUCTION: Endoscopic vacuum (endovac) therapy has shown excellent outcomes when used for esophageal anastomotic leaks. The results of endovac therapy are superior to those of other endoscopic therapies for esophageal leaks.

CASE PRESENTATION: We present a case of a 70-year-old male with esophageal adenocarcinoma who underwent Ivor Lewis esophagogastrrectomy that was complicated by an esophageal leak. After failure of multiple endoscopic therapies (i.e. stents and clips), he responded well to endovac therapy.

DISCUSSION: Endovac therapy is extremely useful for the treatment of esophageal leaks. The widespread use of endovac therapy is feasible, even in smaller community hospitals.

CONCLUSION: Endovac therapy is a valuable tool that can be used widely for the management of esophageal leaks. Commercially available devices need to be developed in order to facilitate endovac placement and exchange so that the procedure is less dependent on the skill of the operator.

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1. Introduction

The incidence of esophageal leaks after esophagectomy is up to 35 %. The factors causing leaks are technical factors such as the type of anastomosis, tension on the anastomosis, perfusion to the anastomosis and layers of sutures used or type of staple lines used. Anastomotic leaks are widely managed by endoscopic stenting, with a success rate of 85 %. Despite having a success rate superior to endoscopic stenting, endoscopic vacuum (endovac) therapy is not the standard therapy for esophageal leaks. We present a case of anastomotic leak after esophagectomy, persistent despite endoscopic stenting and clipping, which was successfully treated with endovac therapy. This case illustrates that endovac therapy can be used successfully, in the management of esophageal leaks that are resistant to other endoscopic therapies. Our patient was managed at a community hospital throughout his entire hospital course. This is unusual, since endovac therapy is not yet commonly practiced in the community setting, even though it is feasible to do so if a surgeon with adequate expertise is available. We wish to demonstrate that endovac therapy is an effective therapy for esophageal leaks

and can be widely delivered as initial therapy even in smaller community hospitals. This case has been reported in accordance with the SCARE 2018 guidelines [1].

2. Case presentation

A 70-year-old Caucasian male with T3N1 moderate to poorly differentiated lower esophageal adenocarcinoma underwent Ivor Lewis esophagectomy following neoadjuvant chemoradiation therapy. He had a history of coronary artery disease but no other significant past history. His family, genetic, social and drug history were not significant, and he lived independently at baseline. He had undergone coronary artery bypass grafting, jejunostomy tube placement, and aggressive nutritional support for pre-operative optimization since being diagnosed with esophageal adenocarcinoma 7 months prior. He had multiple hospital visits between diagnosis and undergoing esophagectomy. At the time of esophagectomy, the conduit was anastomosed to the proximal esophageal stump in an end-to-side hybrid fashion, using a 45 mm linear (EndoGIA) stapler for the posterior wall and 2 layers of sutures to create a handsewn anterior wall. The anastomosis was 30 cm from the incisors. Postoperatively, the patient had an anastomotic leak which was seen on the upper gastrointestinal (GI) contrast study performed on postoperative day (POD) 5. He underwent esophagogastroduodenoscopy (EGD) on POD 6 showing

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a 3 cm sized defect with sinus tract formation at the anastomosis. A fully covered metallic 23 French x10cm esophageal stent was placed endoscopically by an attending gastroenterologist. He underwent successive stent exchanges by the same gastroenterologist due to persistent leak. Endoscopic clips were used as an adjunct to stenting. Despite these procedures, the leak did not seal. Hence, the stents and clips were removed and endoscopic vacuum (endovac) therapy was started on POD 35 by an attending surgeon who was fellowship trained in minimally invasive and bariatric surgery, with 5 years' experience. The procedure of endovac placement was as follows. The patient underwent general anesthesia with endotracheal intubation. A 14 French nasogastric (NG) tube was passed through the nostril and into the pharynx. The NG tube was delivered through the mouth. A polyurethane sponge was tied to the NG tube with nonabsorbable suture, leaving a long loop at the end. An endoscope was loaded with a snare. The snare was used to capture the loop of the nonabsorbable suture on the sponge. The endoscope loaded with the snare was passed into the mouth and directed into the esophagus. The sponge was guided into place within the abscess cavity outside the esophageal lumen and the endoscope was withdrawn. The NG tube was connected to continuous wall suction at (125mmhg). A second nasogastric tube was maintained in the other nostril to 20 mm Hg wall suction. The endovac sponge was changed every 2–4 days. The intervention was well tolerated overall. Although the patient required endotracheal intubation for the procedure, he was extubated after every other sponge exchange and complained of only minor pharyngeal discomfort when extubated. The challenging aspect of this procedure was the act of placing the endovac sponge in the fistula cavity and withdrawing the endoscope without displacing the sponge. The operator had to employ gentle maneuvering of the endoscope while an assistant held the NG tube attached to the endovac sponge in place. Moreover, care was taken to avoid loss of the sponge by its separation from the nasogastric tube. We found that there is a need for the development of a commercially available device that can deploy the sponge within the cavity and can secure the sponge while the endoscope is being withdrawn. Protecting the patient's airway at the time of this procedure was another challenge, as the endotracheal tube was an impediment to the passage of the endoscope. It would perhaps help to have a wide bore over-tube within the pharynx through which the endoscope could be introduced into the esophagus. However, we did not employ this method. For, patient comfort, the endovac device may be placed through a gastrostomy tube instead of by the nasogastric route.

Gradually, the cavity grew smaller and endovac therapy was discontinued on POD 70. The patient was started on an oral diet and discharged on hospital day 84. He was followed in office for 3 months after discharge and unfortunately, passed away shortly after that. The exact cause of his death was unknown as it occurred outside the hospital, but at the time of his death, he had been free of complaints related to his esophageal surgery for some weeks (Figs. 1–5).

3. Discussion

Esophageal leaks occur in up to 35 % of esophagectomies. The mortality from esophagectomy is up to 15 %, of which 40 % is from esophageal leaks [2]. 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 [3].

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



Fig. 1. Postoperative CT scan showing leak.

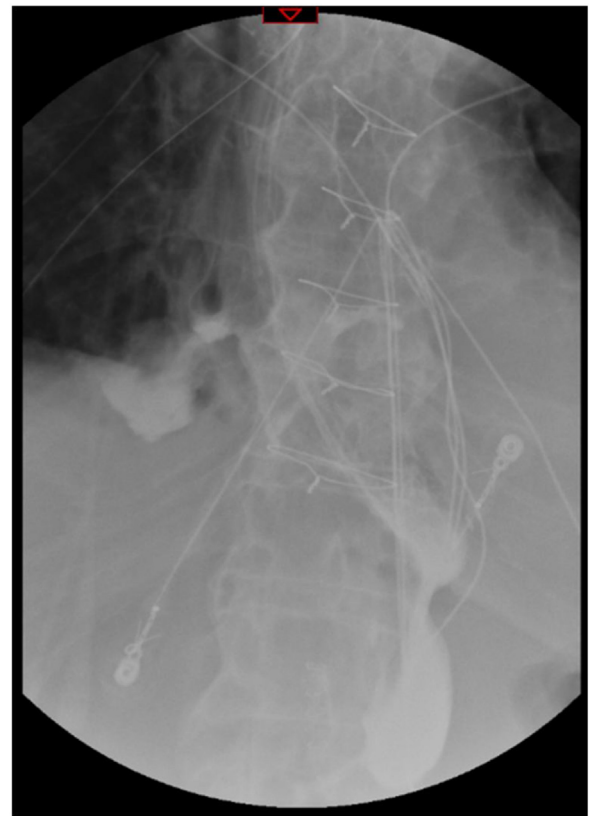


Fig. 2. Postoperative upper GI contrast study showing leak.

days [2]. 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 [4]. Predictors of success with stenting are early stenting, and smaller defects. Anastomotic leaks located in the cervical esophagus 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 %) [5].

Drawbacks of stents are migration, discomfort, and entrapment of infected fluid, causing abscess formation. Endovac therapy has superior outcomes over stenting for postsurgical esophageal leaks. Endovac therapy has an 89 % success rate in leaks after bariatric

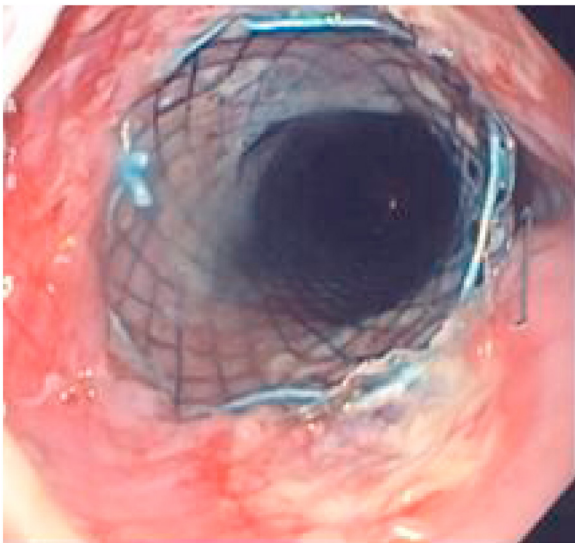


Fig. 3. Stent in place with fistula cavity at 3 o'clock position.



Fig. 4. Fistula cavity with endovac sponge in place.



Fig. 5. Fistula cavity with endovac sponge in place.

surgery [6]. Roux-en-Y gastric bypass has leak rates of 0.4–4% whereas sleeve gastrectomy has leak rates of 1.9–2.4% [7]. This is a large number of patients that could potentially benefit from the widespread use of endovac therapy.

Imaging is recommended prior to endovac therapy to assess the proximity of the cavity to important vascular structures and to prevent fatal hemorrhage. 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. Fistulas to the airway, proximity to blood vessels, and systemic anticoagulation are other contraindications. In these cases, surgical correction is often required.

Endovac therapy if used widely, has the potential to improve the outcomes of esophageal leaks. The widespread use of endovac therapy is feasible even in smaller community hospitals, since the resources required for it are available in many community hospitals. Moreover, commercially available devices need to be developed, to make endovac placement technically easier and less dependent on operator skill. Our case shows that endovac therapy is feasible to deliver in the community setting if an operator with the required expertise is available.

4. Conclusion

Endoscopic vacuum therapy is a valuable tool in managing post-operative esophageal leaks. It can successfully be delivered in the community setting. It should be considered as an option for the initial therapy of esophageal leaks.

Declaration of Competing Interest

None.

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None.

Ethical approval

Exemption by Easton Hospital Ethics Committee.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

Savni Satoskar: data collection, writing paper
Sarang Kashyap: data collection
Francisco Benavides: data collection
Robert Jones: data collection
Richard Angelico: writing paper
Vinay Singhal: writing paper

Research Registration Number

1. Name of the registry: Not applicable
2. Unique identifying number or registration ID: Not applicable
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Guarantor

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Sarang Kashyap
Vinay Singhal

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