ISSN: 2755-6328

Case Report

Open Access Journal of Pharmaceutical Sciences and Drugs

Case Series: Success of Endoscopic Vacuum Therapy [E-VAC) with "Budget-Friendly" Device in Upper Gastrointestinal Complications

Lombardi G*, Firvida S, Pardo B, Sequeira A Taype X and Escobar Fernández R

Dr. Julio Méndez Hospital - Buenos Aires – Argentina

***Corresponding author**
Lombardi G, Dr. Julio Méndez Hospital - Buenos Aires – Argentina.

Received: May 24, 2025; **Accepted:** June 02, 2025; **Published:** June 11, 2025

ABSTRACT

Esophageal and gastric cancers are among the most prevalent malignancies globally. Early-stage treatment typically involves neoadjuvant therapies followed by surgical interventions, including esophagectomy and gastrectomy. While improvements in surgical techniques and devices have enhanced patient outcomes, postoperative complications such as leaks and fistulas remain significant, occurring in 5-20% of cases, with associated morbidity and mortality rates reaching as high as 35.7%. Minimally invasive therapeutic options have shown superior outcomes in managing these complications compared to traditional surgical interventions. Endoscopic and percutaneous approaches are currently considered first-line treatments for such complications. Among endoscopic techniques, endoscopic vacuum therapy (E-VAC) is an accessible and effective option. It has shown comparable, and sometimes superior, efficacy to other endoscopic treatments, such as metallic stents, tissue adhesives and clips. The E-VAC technique involves placing a device through the defect inside the cavity (intra-cavitary) or within the esophageal - gastric lumen over the defect (intra-luminal) and applying negative pressure to promote healing. There are two types of devices commercially available for E-VAC therapy: open-pore polyurethane sponge and open-pore film drains. These are marketed for use in upper GI defects, although they are not widely available worldwide. There exists an adapted version of these devices, a "budget friendly" device made with gauze or open-pore sponge covered with perforated sterile plastic. This technique is feasible with lower cost, greater availability, and results that are not inferior to other drainage systems and it is a validated option in places that the commercial devices are not available.

In this case series, we present five cases of patients who developed post-surgical leaks and fistulas with different sizes, locations, associations and complexities. These include complex esophageal fistulas to extensive gastric dehiscence; all treated with endoscopic vacuum-assisted closure (E-VAC) therapy. Used either as a primary treatment or a rescue therapy in cases where other traditional methods have failed.

In conclusion, E-VAC therapy represents a valuable approach in managing transmural gastrointestinal defects post-upper GIT surgery, offering a minimally invasive alternative with a high success rate and minimal adverse effects. Its use may potentially lower the morbidity associated with traditional surgical interventions for managing leaks and fistulas. Future studies should aim to further validate these findings and establish standardized protocols for E-VAC therapy application.

Keywords: Endoscopic Vacuum Therapy, Upper Gastrointestinal Tract, Case Series

Introduction

Upper gastrointestinal tract (GIT) tumors, including esophageal and gastric cancers, rank among the most prevalent cancers globally. In early stages, treatment primarily involves a combination of neoadjuvant therapy and surgery, with esophagectomy and gastrectomy as the standard procedures. Advances in surgical techniques devices and approaches have improved patients' quality of life and probability of post-surgical complications. However, post-surgical complications remain common, with rates ranging from 30% to 50%, influenced by factors such as surgical center, caseload, and surgeon experience. Leaks and fistulas are particularly challenging complications, as they can prolong hospital stays, increase infection risk, necessitate additional surgeries, and delay the resumption of oral feeding [1]. The incidence and severity of these complications

Citation: Lombardi G, Firvida S, Pardo B, Sequeira A Taype X, Escobar Fernández R. Case Series: Success of Endoscopic Vacuum Therapy [E-VAC) with "Budget-Friendly" Device in Upper Gastrointestinal Complications. Open Access J Pharma Sci and Drug. 2025. 1(1): 1-10. DOI: doi.org/10.61440/OAJPSD.2025.v1.08

are related to factors like anatomical location, size and patient comorbidities, with prevalence rates between 5% and 20% and a 30-day mortality rate reaching up to 35.7% [1, 2].

Minimally invasive therapeutic options have shown superior outcomes in managing these complications compared to traditional surgical interventions [1]. Endoscopic and percutaneous approaches are currently considered first-line treatments for such complications. Among endoscopic techniques, endoscopic vacuum therapy [E-VAC) is an accessible and effective option. It has shown comparable, and sometimes superior, efficacy to other endoscopic treatments, such as metallic stents, tissue adhesives, and clips. E-VAC therapy involves placing a device made of gauze or sponge through the defect inside the cavity (intra-cavitary) or within the esophageal- gastric lumen over the defect (intra-luminal). This technique applies negative pressure (125 to 175 mmHg) to promote healing through different mechanics: macro and micro-deformation, perfusion changes and bacterial clearance [2].

In this case series, we present five cases of post-surgical leaks (dehiscence) and/or fistulas managed with E-VAC therapy, displaying different clinical presentations and outcomes.

Case presentations

Case 1: Complex Esophageal Fistula (Esophagus-Pleuro-Mediastinal and Cutaneous Fistula) with Endoscopic and Percutaneous Resolution by E-VAC Therapy

A 67-year-old female patient underwent minimally invasive esophagectomy, Mc Keown surgery [triple-approach resection of the middle and lower esophagus and esophageal-gastric anastomosis with one-stage reconstruction) for distal esophagus squamous cell carcinoma. On the seventh day postoperatively, developed a cervical cutaneous fistula with failure of percutaneously placed VAC therapy. Esophagogastroduodenoscopy (EGD) and computed tomography [CT) of the chest and abdomen showed a 50% dehiscence of the anastomosis associated with a complex fistula [esophagus - pleuro - mediastinal and cutaneous fistula) (Figure 1.a – 2-a). In the anterior sector of the dehiscence, an 8 cm internal fistula with a cul-de-sac towards the pleura. Proximal to anastomosis, a smaller- diameter fistula with a cul-de-sac extending toward the mediastinum, and anterior to it, a communicating orifice compatible with esophageal-cutaneous fistula with atmospheric communication. (Diagram 1.a).

E-VAC therapy was chosen. Initially, gauze devices were made but dislodged, and later, open-pore surgical sponge devices were made. Two devices were placed simultaneously: one was placed in the esophageal-mediastinal fornix through the cutaneous-esophageal fistula percutaneously [intra cavitary). The other device was placed in the pleural fornix endoscopically [intracavitary). Both probes had a "Y" connection to the negative pressure system (Diagram 1.b).

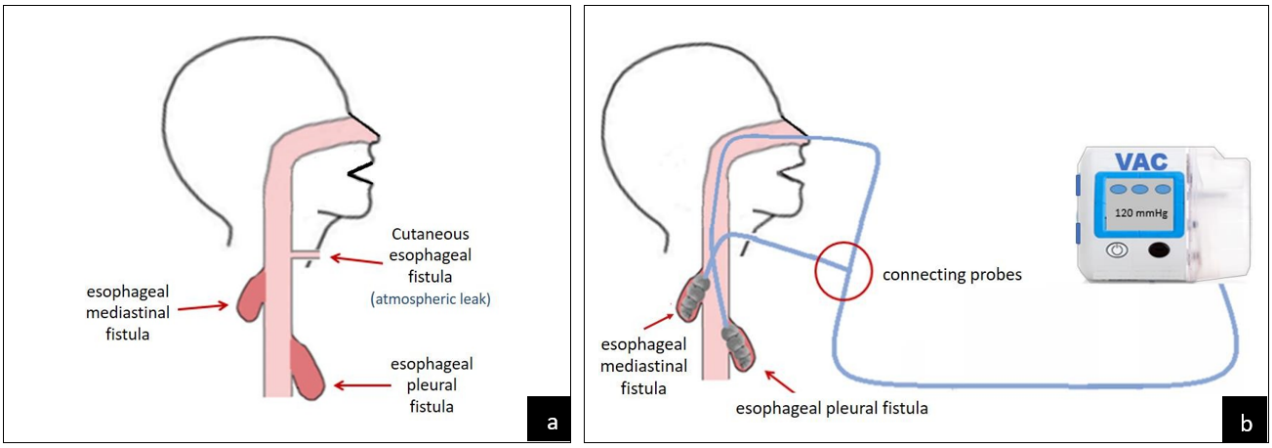

Diagram 1: Complex fistula diagrams and device placement.

- Diagram of complex fistula: esophagus – mediastinum – pleuro – cutaneous
- Diagram of complex fistula with placement of E-VAC device with open pore sponge with 2 probes simultaneously and "Y" connection.

Three replacements of both devices were performed, achieving closure of the cervical and mediastinal fistula. The percutaneou s- cervical device was removed. Then, two replacements of the intracavitary endoscopic device of the pleural sac were performed. The fistula tract was reduced to less than 2 cm, requiring one replacement with an intraluminal device to complete the therapy. As a complement, tissue adhesive was placed in 2 sessions, achieving complete closure of the esophago-pleural fistula. The negative pressure used was 120 to 145 mmHg with a portable suction device.

In summary, 10 therapeutic endoscopies were necessary for complete closure: 1 device placement, 5 intracavitary replacements, 2 endoluminal replacements and 2 tissue adhesive placements. The total treatment duration of 50 days: 40 days of hospitalization and 10 days as an outpatient. Devices were typically replaced every 3 to 5 days. (Table 1. Case 1).

The patient remained clinically stable throughout treatment. Feeding was through jejunostomy. Therapeutic success was confirmed by endoscopic control (Figure 1.b), computed tomography (Figure 2.b) and video-deglutition, allowing exclusive oral feeding and removal of jejunostomy.

In the follow-up, 60 days after the complete closure of the defect, esophageal stenosis appeared as a complication of the E-VAC therapy. This complication was resolved with balloon dilation and radiated cuts.

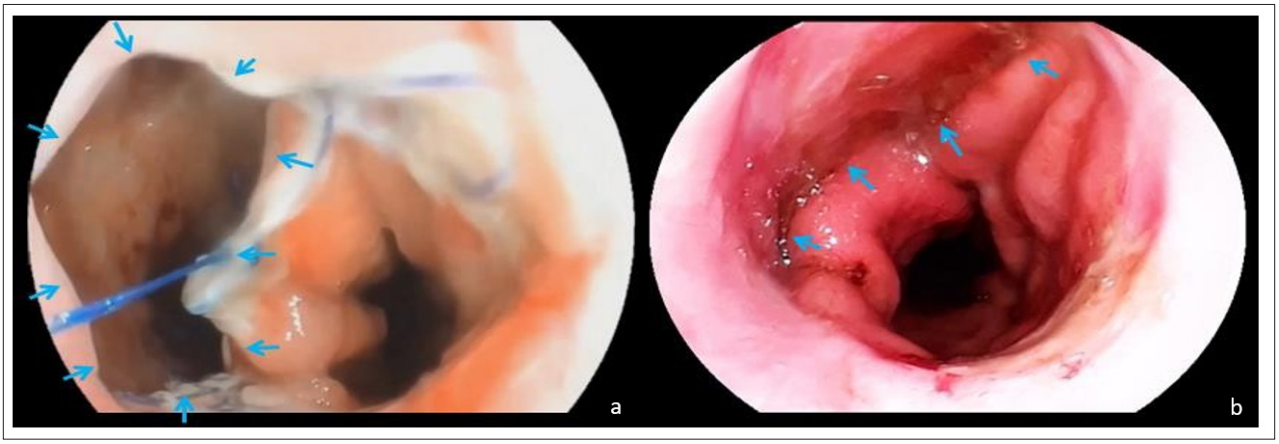

Figure 1: Comparison of initial endoscopy and final endoscopy after E-VAC therapy

- **Initial Endoscopy:** blue arrows marking 50% dehiscence of the anastomosis and cul-de-sac of the esophageal-pleural fistula for esophageal disease.
- **Complete closure of Fistula:** blue arrows indicate complete closure of the defect after therapy with E-VAC and tissue adhesive.

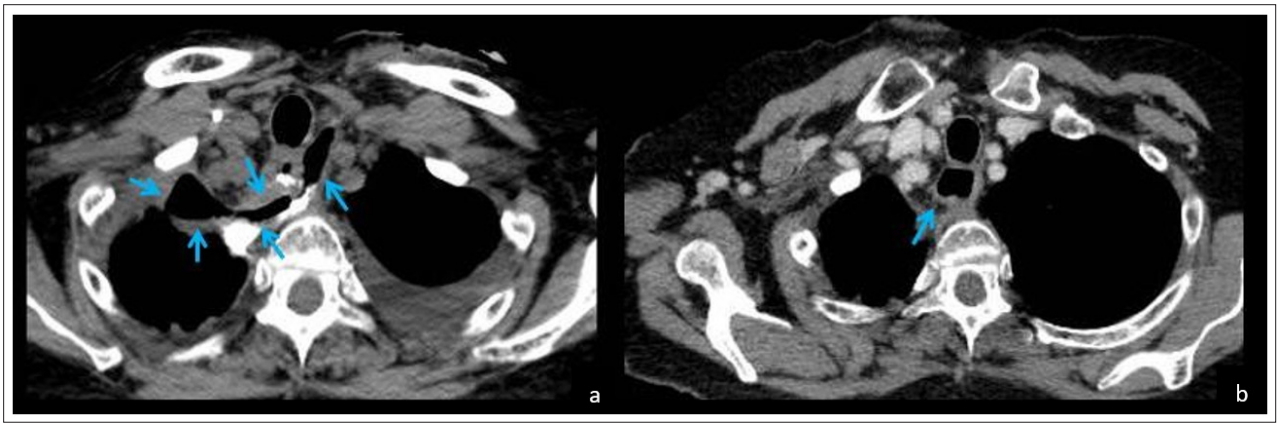

Figure 2: Cervical and Thoracic Computed Tomography [Ct) Cross Sections, Initial and Final Post-Therapy

- **Initial CT:** Complex esophageal fistula: blue arrows marking the pleural and mediastinal fistulous tract.
- **Post-therapy control CT:** blue arrow showing complete closure of the fistula after therapy with E-VAC and tissue adhesives.

Case 2: Esophageal Fistula with Endoscopic Resolution By E-Vac Therapy with a Trans-Metal Stent Gastric Device

A 77-year-old male patient underwent minimally invasive esophagectomy, Ivor Lewis surgery [resection of the middle and lower esophagus with a dual approach, followed by one-stage reconstruction with esophagogastric anastomosis) for lower third of the esophagus adenocarcinoma. Seventy-two hours postoperatively, he presented with hemodynamic instability and increased drainage output with purulent and bilious characteristics. EGD revealed a dehiscent esophagogastric anastomosis located 30 cm from the upper dental arch, with a fistulous orifice compromising 20% of the circumference and producing purulent and bilious output. The stomach showed an intact mechanical suture scar (Figure 4.a).

An OVESCO® clip was attempted, but placement was unsuccessful due to the friability of the tissue adjacent to the defect. Consequently, a fully covered metallic stent (10 cm x 20 mm) was placed, with the proximal cap at 25 cm and the distal cap at 35 cm. Due to persistent drainage and hemodynamic instability, the stent was replaced with a larger-diameter, fully covered metallic stent (15 cm x 22 mm), with the proximal cap at 24 cm and the distal cap at 39 cm.

Despite clinical improvement, significant drainage output continued. EGD confirmed that the stent was not in contact with the gastric wall and high flow bilious reflux was observed. Therefore, an E-VAC device with a 12 cm open-pore sponge was created and placed trans-stent intraluminal within the gastric cavity. To facilitate placement, an overtube was used to guide the device through the esophagus and into the stomach. A second tube was then placed nasally and externalized through the oral cavity. Using the Rendezvous technique, both tubes were joined to form a single conduit [Figure 3).

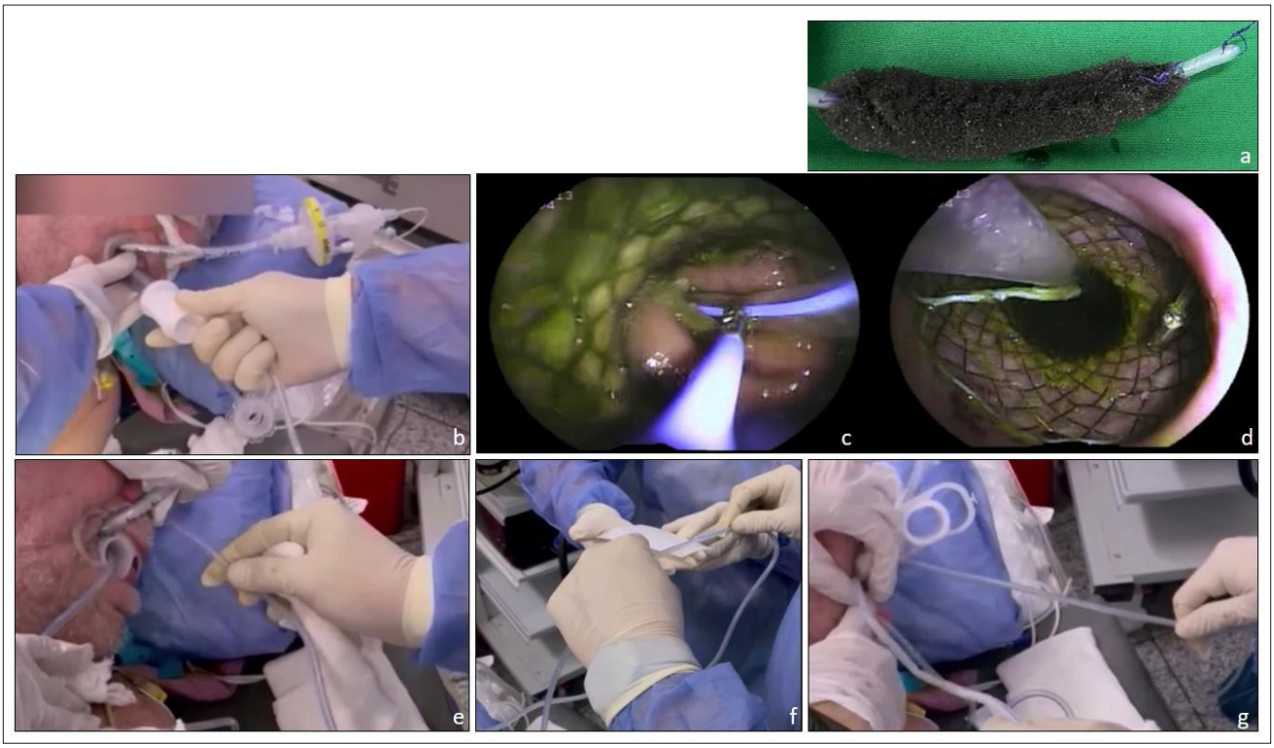

Figure 3: Placement of intraluminal gastric VAC trans-STENT device with esophageal overtube and Rendez-Vouz technique

- VAC sponge device 12 cm.
- Placement of device inside overtube to facilitate entry
- Direction of device with foreign body clamp towards gastric cavity.
- Adequate positioning and operation of trans-STENT device
- Second tube via nasal route with oral exteriorization.
- Connection of VAC tube to nasal-oral tube [Rendezvouz technique)
- Traction of single tube at nasal level

The patient's condition improved with decreased drainage output, and the E-VAC device was subsequently removed, followed by the metallic stent. The VAC device was set to a pressure of 145 to 160 mmHg with a portable suction unit.

In summary, five therapeutic endoscopies were required for complete closure of the defect: 1 stent placement [10 mm x 20 mm), 1 stent replacement [15 mm x 22 mm), 1 VAC placement, 1 VAC removal, and 1 stent removal [Diagram 2). The total treatment duration of 75 days in a closed unit.

The patient initially required hemodynamic support but later achieved clinical stability. Nutritional support was provided enterally via jejunostomy. Therapeutic success was confirmed by endoscopic control [Image 4.b), allowing for the initiation of exclusive oral feeding and removal of the jejunostomy. [Table 1. Case 2)

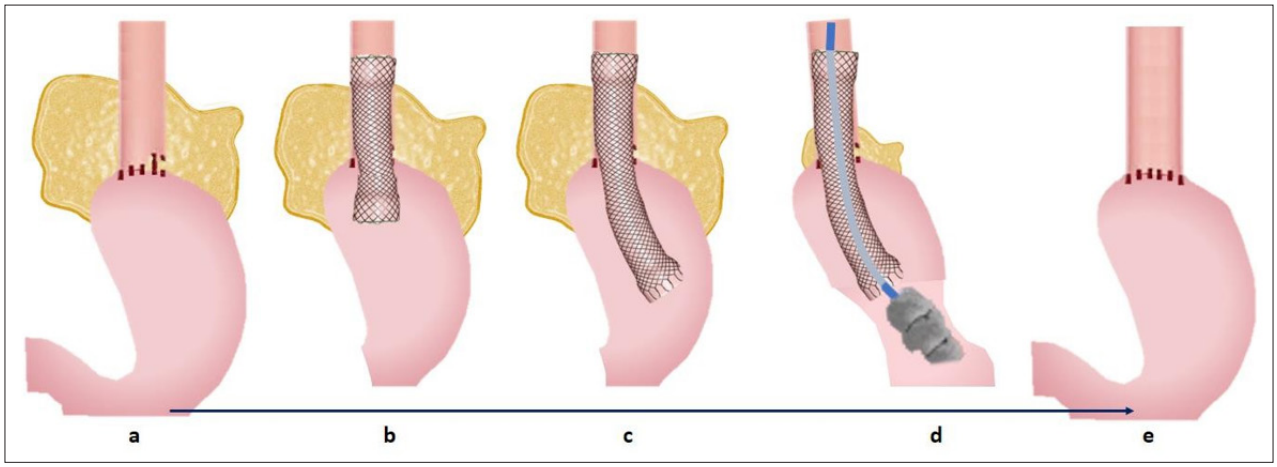

Diagram 2: Chronological endoscopic therapies

- A 20% circumferential anastomotic dehiscence associated with purulent and bilious discharge.
- A 10 mm x 20 mm fully covered metal stent.
- A 15 mm x 22 mm fully covered metal stent.
- Placement of E – VAC trans-Stent device and decreased discharge.
- Removal of VAC and stent with complete closure of defect.

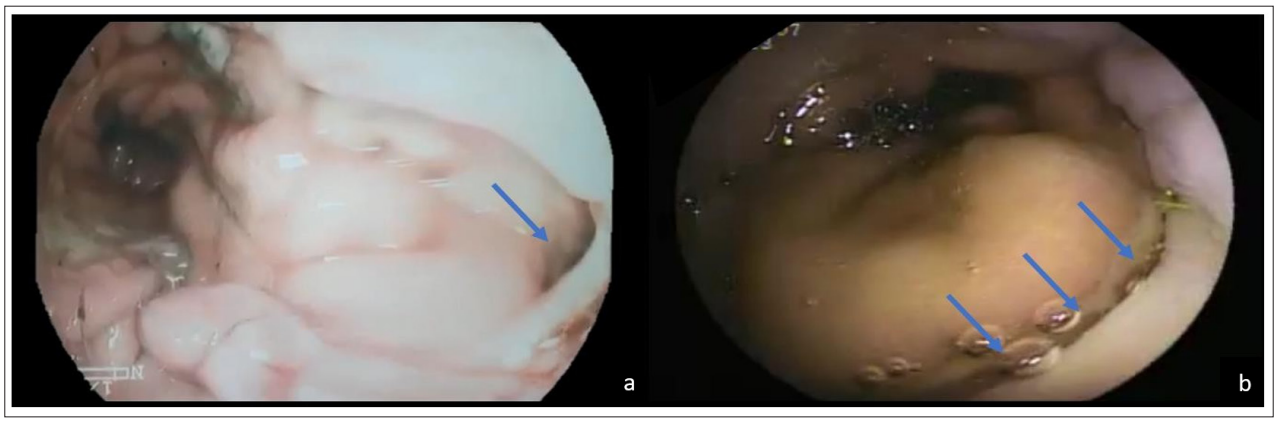

Figure 4: Comparison of Initial Endoscopy and Final Endoscopy Post-Therapeutic E-Vac and Metallic Stent

- **Initial endoscopy:** blue arrow indicating 20% dehiscence of the anastomosis.
- **Final endoscopy:** blue arrows marking the complete closure of the dehiscence after E-VAC trans-stent therapy.

Case 3: Extensive Dehiscence of Gastric Mechanical Suture with Endoscopic Resolution by means of Gastric Endoluminal E-VAC Therapy

A 60-year-old female patient underwent minimally invasive esophagectomy with a triple approach (McKeown surgery) for lower third of the esophagus invasive squamous cell carcinoma. Twelve days postoperatively, a CT scan revealed a right paravertebral leak extending into the ascending aorta. A subsequent swallow test with methylene blue was positive. EGD: extensive dehiscence of the gastric tube suture, with both surgical drainage tubes (cervical and mediastinal) visualized extending into the gastric lumen, an intermediate mucosal bridge was seen. There was associated torsion of the gastric tube distal to the dehiscence [Figure 5a).

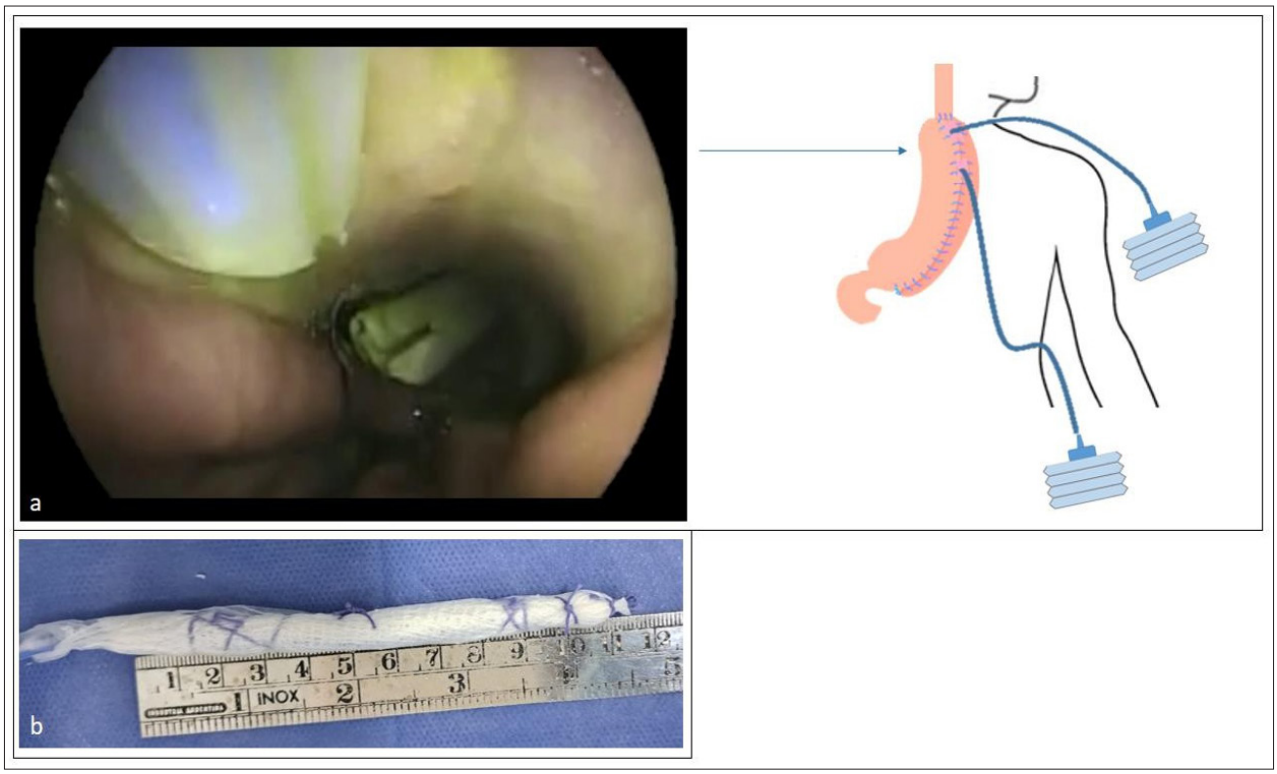

Figure 5a: Endoscopy and external diagram of the position of surgical drains proceeding to the gastric lumen through dehiscence. On the left, EGD with visualization of both drains [cervical and mediastinal) with procidence the gastric lumen through anastomotic dehiscence with an intermediate mucosal bridge. On the right, external diagram to surgical drains entering due to dehiscence b. E-VAC device: 10 cm device made of gauze

Both surgical drains were removed, revealing mechanical suture dehiscence. Endoscopic E-VAC therapy was performed using a 12 cm intraluminal gauze device [Figure 5.b). Two subsequent device replacements were made, and EGD confirmed complete closure of the dehiscence with device removal. The VAC device was set to a pressure of 140 mmHg, using a portable suction device.

In summary, four therapeutic endoscopies were required for complete closure of the defect: 1 device placement, 2 replacements, and 1 device removal. The patient spent a total of 46 days in treatment, with 4 days of inpatient hospitalization and 42 days as an outpatient. The average interval between replacements was 10 days.

The patient remained clinically stable throughout the treatment. Nutritional support was provided enterally via jejunostomy. Therapeutic success was confirmed by endoscopic control [Figure 6.b), leading to the initiation of exclusive oral feeding and the removal of the jejunostomy. [Table 1. Case 3)

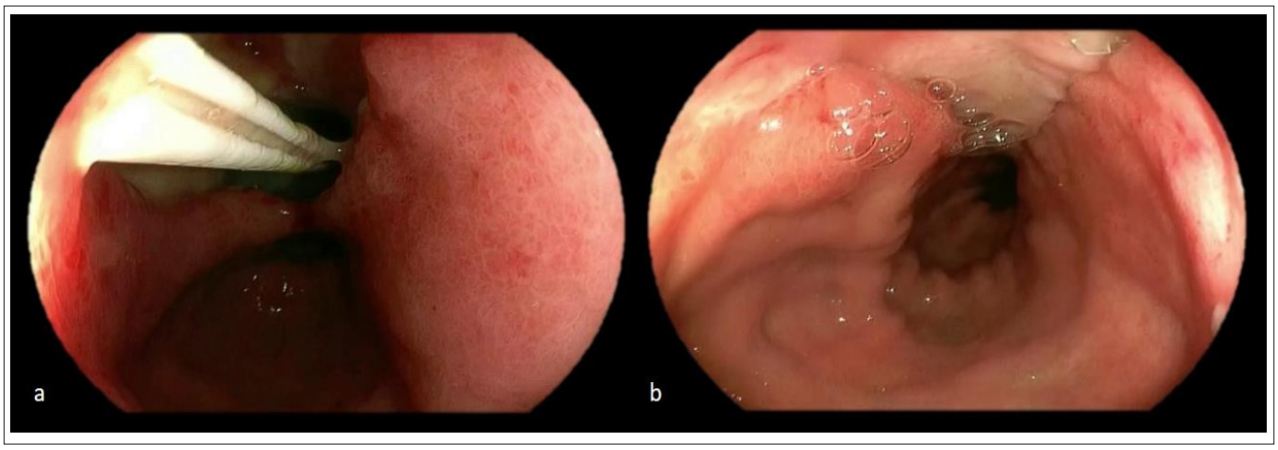

Figure 6: Comparison of initial endoscopy and final post-therapy endoscopy

- **Initial endoscopy:** visualization of mediastinal drainage into the gastric lumen due to a dehiscence of the mechanical suture of the gastric tube
- **Final post-therapy endoscopy with the E-VAC device:** scar tissue and complete closure of the dehiscences.

Case 4: Dehiscence of Esophageal-Jejunal Anastomosis with Resolution by E-VAC Therapy

A 61-year-old male patient underwent laparoscopic total gastrectomy with end-to-side esophagojejunostomy for "signet ring cell" gastric adenocarcinoma. Seventy-two hours postoperatively, he developed hydropneumothorax, which required thoracentesis. Pleural fluid analysis revealed elevated amylase levels, consistent with salivary amylase. EGD revealed a 20% dehiscent area at the esophagojejunostomy site (Figure 7.a). A 10 cm intraluminal gauze E-VAC therapy device was placed, with a single replacement per week, leading to complete closure of the dehiscence. The central suction system was set to 400 mmHg, and a 20 G ABBOCATH® catheter was used to puncture the plastic suction tube. (Figure 7.c)

In summary, three therapeutic endoscopies were performed for complete closure of the defect: 1 device placement, 1 replacement, and 1 device removal. The patient was hospitalized for a total of 15 days and remained clinically stable throughout the procedure.

Feeding was provided enterally via jejunostomy. Therapeutic success was confirmed by endoscopic control [Figure 6.b), enabling the initiation of exclusive oral feeding and the removal of the jejunostomy. [Table 1. Case 4)

- **Initial endoscopy:** A 20 % dehiscent area at the esophagojejunostomy site
- **Final endoscopy after E-VAC device removal:** blue arrows indicating complete closure of the dehiscence.
- **Central aspiration with a plastic catheter perforated with ABBOCATH ®:** Aspiration turned on at maximum with leak due to perforation with ABBOCATH® 20 G generating an approximate pressure of 125 mmHg

Case 5: Dehiscence of multiple Esophageal-Jejunal Anastomosis and Jejunal Suture Fistulous Orifice with Resolution by Means of E-VAC Therapy

A 59-year-old male patient underwent laparoscopic total gastrectomy with end-to-side esophagojejunostomy for type 1 gastric neuroendocrine tumors [NET). Seventy-two hours postoperatively, he presented with an episode of upper gastrointestinal bleeding by hematemesis and blood discharge through the drains and jejunostomy. EGD revealed a 15% dehiscence at the proximal esophagojejunostomy site [Figure 9.a). Further examination of the same anastomosis on a distal zone revealed ulcerated mucosa with blood remnants and a second 20 % dehiscence [Figure 9.c), along with prolapse of the mediastinal surgical drainage into the esophagojejunal lumen [Figure 8.a). The mediastinal surgical drainage tube was subsequently removed [Figure 8.b and 8.c). Additionally, a 3 mm fistulous orifice was observed at the mechanical suture site of the lateral jejunal loop end [Figure 9.b).

An 11 cm E-VAC gauze device was placed intraluminaly to cover all defects. Two subsequent replacements were performed, with EGD confirming complete closure of the dehiscence and removal of the device. The central suction system was initially

set to 400 mmHg, and a 20 G ABBOCATH® catheter was used to puncture the plastic suction tube for the first 10 days. Following this, a portable suction device was used with a pressure setting of 140 mmHg.
In summary, four therapeutic endoscopies were required for complete closure of the defect: 1 device placement, 2 replacements, and 1 device removal. The total length of hospitalization was 30 days. The patient remained clinically stable throughout treatment, with enteral feeding via jejunostomy.

Therapeutic success was confirmed by endoscopic control (Figure 9.d, 9.e, and 9.f), allowing the initiation of exclusive oral feeding and the removal of the jejunostomy. (Table 1. Case 5)

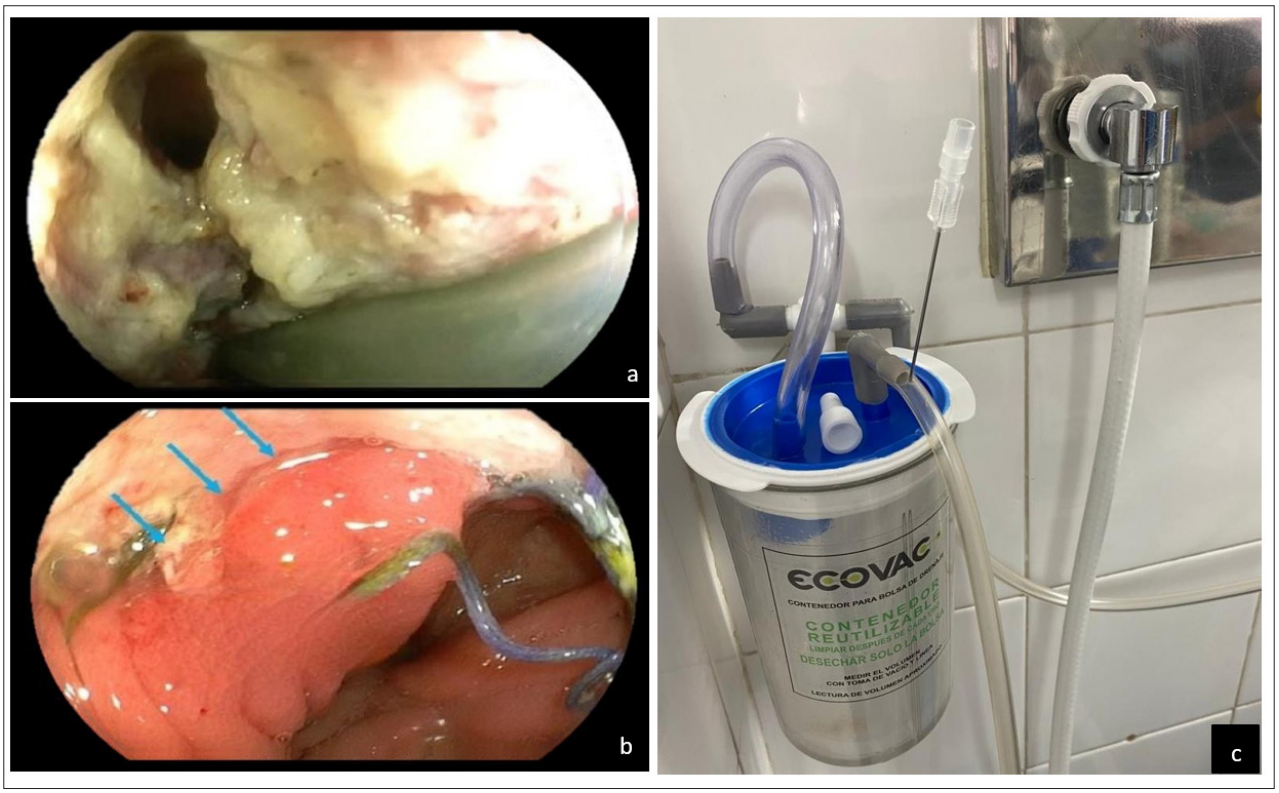

Figure 7: Comparison of Initial Endoscopy and Final Endoscopy after E-VAC Therapy

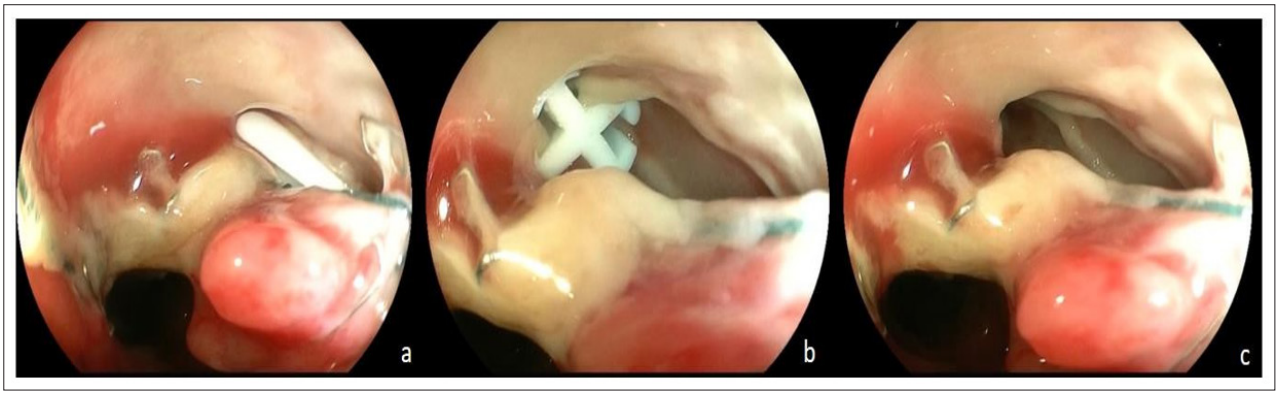

Figure 8: EGD with visualization and removal of mediastinal surgical drainage towards the esophagojejunal lumen due to surgical suture dehiscence

- Internal mediastinal drainage tube from the esophagogastric lumen through anastomotic dehiscence.
- b- c. Retirement of surgical drainage of the esophageal-jejunal lumen.

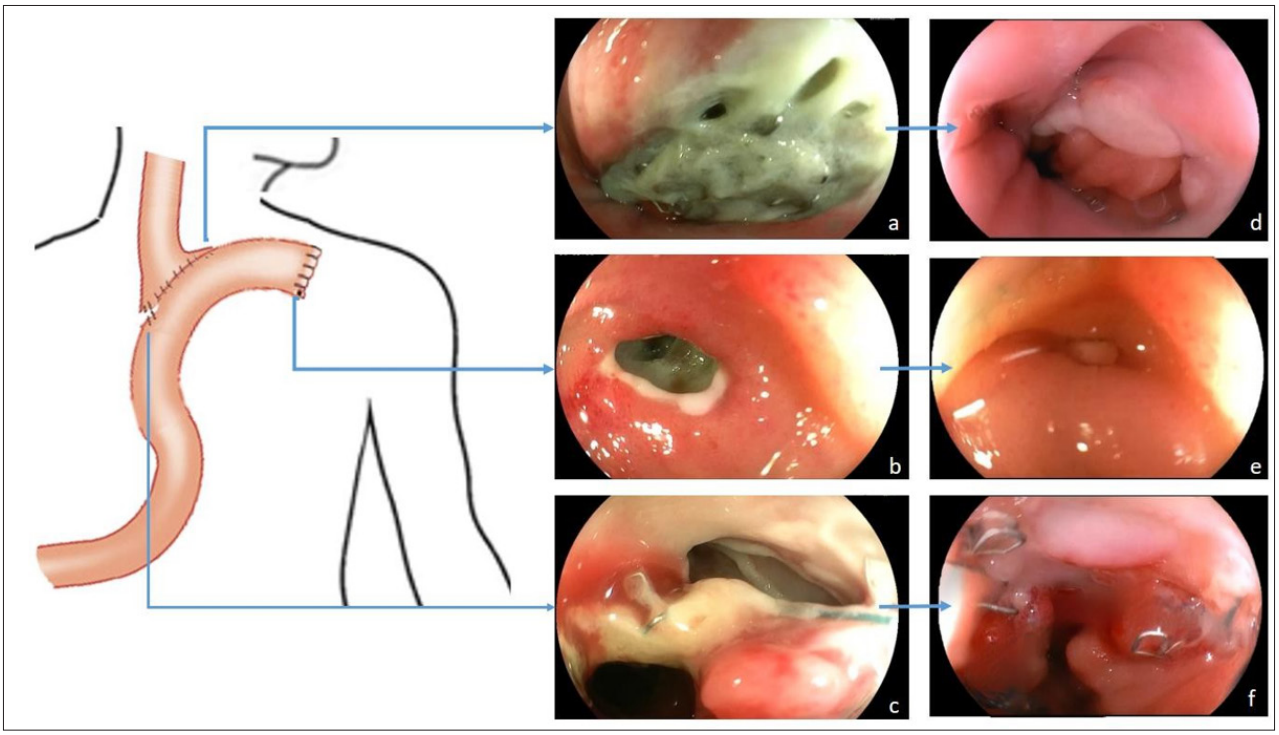

Figure 9: Diagram showing defect localization and comparison of initial and final endoscopies after E-VAC therapy

a-b-c Initial EGD

- A 15% dehiscence of the proximal esophagojejunal anastomosis.
- Millimetric fistulous orifice of the lateral end of the jejunum.
- A 15 - 20% dehiscence of the distal esophagojejunal anastomosis after removal of the anterior mediastinal drain

d-e-f EGD after E-VAC therapy

- Closure of proximal esophageal-jejunal dehiscence
- Closure of fistulous orifice of lateral jejunal end
- Closure of dehiscence of 15-20% distal esophageal-jejunal anastomosis

Table 1: Summary of patients.

Case	Sex	Age	Cause	Surgery	Leak / Fistula	VAC device	Changes	Aspiration	Associated techniques	Days	Complications
1	F	67	Middle third of the esophagus squamous cell carcinoma	Total esophagectomy with esophageal-gastro anastomosis	Complex esophageal-pleuromediastinal-cutaneous fistula	Sponge Intracavitary and Intraluminal	5	Portable suction unit	Tissue adhesives	50	Esophageal estenosis
2	M	77	Lower esophagus adenocarcinoma	Middle and lower third esophagectomy with esophageal-gastro anastomosis	Esophagogastric dehiscence 20%	Sponge Intraluminal	2	Portable suction unit	SEMS	75	No
3	F	60	Lower third esophagus squamous cell carcinoma	Middle and lower third esophagectomy with esophageal-gastro anastomosis	Extensive gastric mechanical suture dehiscence	Gauze Intraluminal	2	Portable suction unit	No	46	No
4	M	61	Gastric signet ring cell adenocarcinoma	Total gastrectomy + esophageal-jejunal anastomosis	Esophagojejunal Dehiscence 20%	Gauze Intraluminal	1	Central suction	No	15	No
5	M	59	Gastric neuroendocrine tumors (NET 1)	Total gastrectomy + esophageal-jejunal anastomosis	Esophageal- jejunal proximal + distal leak and mechanical enteral suture	Gauze Intraluminal	2	Central suction and Portable suction unit	No	20	No

Sex: F [Female) – M [Man). **Age:** in years. **Leak/fistula type of defects. VAC device:** material from which the device was made. **Changes:** average number of replacement days. **Associated techniques:** Other techniques that were used in addition to E **V**AC treatment **Days:** Total number of days of therapy that led to complete closure from the first endoscopy to the last. **Complications:** Complications associated with EVAC therapy

Discussion

Knowledge and management of postoperative complications in upper GI surgery are essential due to their high incidence and the associated morbidity and mortality. Fistulas and leaks account for 5% to 20% of these complications and represent a particular challenge due to their variability and complexity [1]. The endoscopic and percutaneous treatment are considered the preferred approaches for managing these complications. Among the endoscopic alternatives, E-VAC therapy has emerged over the last decade as a minimally invasive, accessible, and effective solution, comparable to—and in some cases superior to—other endoscopic treatments. Given that it is a relatively new technique, there are currently no standardized indications; however, all patients with acute or chronic GI defects are potential candidates for either primary or rescue therapy [2]. The aforementioned techniques may be applied alone or in combination, and as first line or as salvage treatment after failure of previous approaches [1].

This technique, unlike others, has other mechanisms that promote the healing and closure of defects. These mechanisms include macro and micro deformation, changes in perfusion, exudate control, and bacterial clearance [2]. Continuous drainage, promotes granulation tissue formation and re-epithelialization, thus inducing second intention closure of the defect/cavity. The negative pressure within the defect allows mechanical cleaning of the wound from microorganisms and interstitial edema reduction by improvement of microcirculation [1]

There are two types of devices commercially available for E-VAC therapy: open-pore polyurethane sponge devices and open-pore film drains [2]. These are marketed for use in upper GI defects, although they are not widely available worldwide. In Brazil, Dr. De Medeiros and his team developed an adapted version of these devices, a “low-cost VAC” using gauze covered with perforated sterile plastic. They demonstrated that this technique is feasible with lower cost, greater availability, and results that are not inferior to other drainage systems [16]. This technique has since been replicated in different versions [2-16]. In our case series, all devices were made with gauze or polyurethane open-pore sponge over a 16 Fr silicone tube/probes [nasogastric tubes], secured in place with nylon thread and covered with adhesive film.

The insertion of the probes has been described either through the nasal cavities, exteriorized and assembled in the mouth, or assembled and then inserted directly through the nasal cavities and progressed toward the hypopharynx [2]. However, in cases with larger diameter devices (mainly those made of sponge), where passage through the nasal cavities to the hypopharynx is difficult, it may be useful to use an overtube to place the device. A second probe is then placed through the nasal passage, exteriorized through the mouth, and the Rendezvous technique is employed to join both tubes to form a single tube, as was done in case 2.

The suction device used is portable and allows the configuration of appropriate negative pressure. It provides exact pressure settings and adjustments to suction mode (continuous or intermittent), as well as patient mobility for outpatient management. If this device is unavailable, an alternative is to use central suction at maximum pressure (400 mmHg) and perforate the plastic suction tube with a 20 G ABBOCATH® catheter to obtain an adequate pressure of around 125 mmHg [11]. In two of our cases (case 4 and 5), due to the lack of availability of the portable device, we used central suction with the same results as the portable suction device.

It is important to mention that the aspiration circuit must be closed, with no atmospheric leaks, in order to generate negative pressure and effective aspiration. In case 1, negative pressure could not initially be obtained due to the presence of an atmospheric leak caused by the esophagus-cutaneous fistula. In this case, it was helpful to complement the endoscopic therapy with a percutaneous approach for occlusion of the atmospheric leak, which ultimately led to therapeutic success.

Replacements/changes are typically carried out every 5 to 7 days, depending on the material used. No more than 7 days is recommended, as the sponge can become embedded in surrounding tissue. The longer the device remains in place, the more difficult it will be to remove, and the higher the risk of bleeding. The number of exchanges required for complete closure varies according to the complexity of the defect, with an average of 5 ± 2.2 exchanges for upper GI defects [1,2]. In the cases presented, a total of 1 to 2 exchanges were required. Case 1 required the highest number of exchanges, due to the complexity of the fistula. This case involved atmospheric communication and compromised multiple organs, including cervical, esophageal, thoracic, and mediastinal organs. Additionally, it was the first case performed by our service, and as experience with the technique increased, success in defect closure was achieved with fewer exchanges.

Regarding the efficacy of this therapy, since its use in upper GI defects was first described in 2008, multiple publications have demonstrated its usefulness and effectiveness. The efficacy rate for upper GI defects ranges from 66.7% to 100% according to different studies [17,2]. This variability in efficacy is attributed to factors such as the use of different EndoVAC devices, the learning curve at each center, and the health status of the patients at the time of device placement. Schniewind et al. published the largest series comparing E-VAC with other approaches for the treatment of leaks after esophagectomy, showing that the E-VAC technique is superior to surgical revision, stenting, and conservative treatment [14]. In a retrospective analysis, Berlth et al. compared E-VAC therapy with self- expanding stents [metal and plastic]. The efficacy rate was significantly higher for E-VAC (84.4%) compared to stents (53.8%), with a shorter treatment duration, a lower rate of major complications, and lower in-hospital mortality rate [15]. Thus, the effectiveness of this therapy has been demonstrated both as a primary and rescue therapy in cases where other traditional methods, such as stents and clips, have failed. In our case series, therapeutic efficacy was 100% both as a standalone treatment and in combination with other therapies. In case 2, E-VAC therapy was used as a complementary option to rescue a metallic stent. In this particular case, it was suspected that the stent did not have the appropriate diameter to redirect secretions properly and ensure adequate contact between the stent and the defect due to the location of the defect [the esophageal-gastric transition zone]. By placing an intraluminal VAC device through the stent, negative pressure

was generated, promoting contact between the esophagus and gastric wall and redirecting bile reflux, decreasing bile salt concentration at the defect site (secretion clearance mechanism). Through this integration of mechanisms, complete closure of the defect was achieved.

Regarding safety and complications, E-VAC therapy is considered a safe procedure, with a low rate of adverse events, less than 4% of cases [2]. The most common adverse events are sponge dislocation, bleeding, and stenosis. In our cases, case 1 presented a short-term adverse event of sponge dislocation and a late complication of anastomotic stenosis, which required dilation and radial cuts.

Nutritional support is critical for proper wound healing. For patients undergoing E-VAC therapy, optimal nutritional support is essential. Since these surgeries often compromise the upper GI tract and temporarily affect the oral pathway, a jejunostomy is commonly performed during the same surgical procedure, as was the case in all of our patients. For those without a jejunostomy, alternatives for enteral nutrition have been developed, such as double-lumen drains with additional jejunal feeding tubes. Additionally, devices like the VAC STENT facilitate the passage of a naso-enteral feeding tube through the device toward the distal digestive tract.

Conclusion

The management of leaks and fistulas as post-surgical complications of the upper gastrointestinal tract requires an interdisciplinary approach to provide the necessary resources and ensure therapeutic success given the diversity in their presentation. E-VAC therapy, either as a primary treatment or in combination with other techniques, has proven to be effective, accessible, and easily reproducible for the treatment of transmural gastrointestinal defects with minimal adverse effects and complications.

References

1. Cereatti F, Grassia R, Drago A, Conti CB, Donatelli G. Endoscopic management of gastrointestinal leaks and fistulae: What option do we have? World Journal of Gastroenterology. 2020. 26: 4198.
2. de Moura DT, de Moura BF, Manfredi MA, Hathorn KE, Bazarbashi AN, et al. Role of endoscopic vacuum therapy in the management of gastrointestinal transmural defects. World Journal of Gastrointestinal Endoscopy. 2019. May. 11: 329.
3. Ooi G, Burton P, Packiyanathan A, Loh D, Chen R, et al. Indications and efficacy of endoscopic vacuum-assisted closure therapy for upper gastrointestinal perforations. ANZ journal of surgery. 2018. 88: E257-63.
4. de Lima MS. Top tips on endoscopic vacuum therapy [with video]. Gastrointestinal Endoscopy. 2022. 96: 129-130.
5. Kuehn F, Loske G, Schiffmann L, Gock M, Klar E. Endoscopic vacuum therapy for various defects of the upper gastrointestinal tract. Surgical endoscopy. 2017. 31: 3449-3458.
6. Mees ST, Palmes D, Mennigen R, Senninger N, Haier J, et al. Endo-vacuum assisted closure treatment for rectal anastomotic insufficiency. Diseases of the Colon & Rectum. 2008. 51: 404-410.
7. Endo-SPONGE for colorectal anastomotic leakage. Association of Surgeons of Great Britain and Ireland NICE. 2019.
8. Lange J, Dormann A, Bulian DR, Hügle U, Eisenberger CF, Heiss MM. VACStent: Combining the benefits of endoscopic vacuum therapy and covered stents for upper gastrointestinal tract leakage. Endoscopy International Open. 2021. 9: E971-E976.
9. Pattynama LM, Pouw RE, van Berge Henegouwen MI, Daams F, et al. Endoscopic vacuum therapy for anastomotic leakage after upper gastrointestinal surgery. Endoscopy. 2023. 55: 1019-1025.
10. Fair L, Ward M, Vankina M, Rana R, McGowan T, et al. Comparison of long-term quality of life outcomes between endoscopic vacuum therapy and other treatments for upper gastrointestinal leaks. Surgical Endoscopy. 2023. 37: 6538-6547.
11. de Moura DT, do Monte Junior ES, Hathorn KE, de Medeiros FS, Thompson CC, et al. Modified endoscopic vacuum therapy in the management of a duodenal transmural defect. Endoscopy. 2021. 53: E17-E18.
12. de Medeiros FS, do Monte Junior ES, de Lima França R, de Medeiros Neto HC, Santos JM, et al. Preemptive endoluminal vacuum therapy after pancreaticoduodenectomy: a case report. World Journal of Gastrointestinal Endoscopy. 2020. 12: 493.
13. Demoura. Oral presentation – Vacuum Therapy. Cuenca del Plata – Endiba, BsAs Argentina. 2023.
14. Schniewind B, Schafmayer C, Voehrs G, Egberts J, von Schoenfels W, Rose T, Kurdow R, Arlt A, Ellrichmann M, Jürgensen C, Schreiber S. Endoscopic endoluminal vacuum therapy is superior to other regimens in managing anastomotic leakage after esophagectomy: a comparative retrospective study. Surgical endoscopy. 2013. 27: 3883-3890.
15. Berlth F, Bludau M, Plum PS, Herbold T, Christ H, et al. Self-expanding metal stents versus endoscopic vacuum therapy in anastomotic leak treatment after oncologic gastroesophageal surgery. Journal of Gastrointestinal Surgery. 2019. 23: 67-75.
16. Kamamoto F, Lima AL, Rezende MR, Mattar-Junior R, Leonhardt MD, Kojima KE, Santos CC. A new low-cost negative-pressure wound therapy versus a commercially available therapy device widely used to treat complex traumatic injuries: a prospective, randomized, non-inferiority trial. Clinics. 2017. 72: 737-742.
17. Wedemeyer J, Schneider A, Manns MP, Jackobs S. Endoscopic vacuum-assisted closure of upper intestinal anastomotic leaks. Gastrointestinal endoscopy. 2008. 67: 708-711.