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Case Report

Successful management of gastric fistulas with endoluminal vacuum therapy after a type IV hiatal hernia repair: a case report

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ABSTRACT

Endoluminal vacuum therapy (Endo-Vac) is currently part of the first line in the endoscopic management of gastrointestinal fistulas or perforations, due to its high success rates and low percentage of adverse events. We present the case of a 48-year-old man who presented with two gastric fistulas after the correction of a type IV hiatal hernia and anti-reflux surgery, which was successfully managed with endoluminal vacuum therapy without complications. Endo-Vac therapy is currently a safe and effective technique for the treatment of transmural defects in the digestive tract. However, it is necessary to develop an algorithm based on the location, size of the defect, associated stenosis, infection, and available experience to reduce complications and possible adverse events, always in conjunction with a multidisciplinary team.

Keywords: Gastrointestinal, Endoscopic vacuum therapy, Hiatal hernia repair, Fistula, Perforation, Case report

INTRODUCTION

Endoscopic vacuum therapy, also known as endo-VAC, was first successfully described in 2003 for the treatment of a patient with abdominal sepsis secondary to postoperative rectal anastomosis leakage.[1]

Since then, its use has increased as the technique has been perfected and disseminated; it is currently proposed as an alternative for the treatment of acute perforations, leaks, and fistulas in patients with digestive tract disorders. Although with increasingly frequent indications, given its high success rates.[2]

Knowledge of the technique and its applications is relevant to the endoscopist who faces the treatment of patients with defects in the digestive tract. In this article, we report the case of a patient treated with endoscopic vacuum therapy for the resolution of a gastric fistula after grade IV hiatal hernia correction and anti-reflux surgery. An excellent result was obtained in the management of this complex fistula without complications.

CASE REPORT

This article presents the case of a 48-year-old man with a history of grade III arterial hypertension, urolithiasis, and upper digestive tract bleeding. Additionally, with a surgical history of three unspecified knee surgeries, rotator cuff correction, appendectomy, and recently correction of grade IV hiatal hernia plus antireflux surgery (modified Hill + anterior gastropexy) and gastric wedge resection. The realization of the gastric wedge resection was decided by preoperative findings in abdominal computed tomography (CT), in which a mass of suspicious morphology was located in the greater curvature, which was completely respected and later sent to pathology, with a positive result for gastrointestinal stromal tumor. The patient denies any type of toxic or allergic history.

The patient presented a favorable evolution and was discharged on the second postoperative day without any complaint.

He was admitted to the emergency department, on the 4th day postoperatively after the correction of the hiatal hernia and gastric wedge resection, due to a clinical presentation of one day of evolution consisting in distension and oppressive abdominal pain with an intensity 7/10 on the visual analogue scale, with irradiation to the right hemithorax and back, associated with a sensation of dyspnea. On physical examination with tachycardia, high blood pressure, and a distended abdomen without signs of peritoneal irritation. Paraclinical findings on admission with leukocytosis, neutrophilia, elevated C-reactive protein (CRP) and arterial blood gases with metabolic alkalosis without hyperlactatemia.

Therefore, it was decided to start empirical antibiotic therapy with piperacillin tazobactam, and imaging tests were requested. The chest X-ray revealed bilateral pleural effusions, predominantly on the right hemithorax, associated with atelectatic changes in both lower lobes without being able to rule out inflammatory involvement, as well as an air bubble in the mediastinum to be characterized by thoracoabdominal CT. In the CT, a large sliding hiatal hernia is identified including the fundus, gastric body, and a significant portion of the greater omentum; It also shows a previously known nodular lesion in the anterior wall of the gastric body of suspicious appearance and a free-looking bilateral pleural effusion, with important changes of lobar atelectasis that compromise the middle and lower lobe.

Due to the patient's symptoms and imaging findings of atelectasis in the lower lobes and an image suggestive of contrast medium leakage in the lower esophagus plus hydro pneumomediastinum, conditioned by residual hernial sac, an emergency surgical board was requested, which was integrated by different surgery services, including thoracic surgery, minimally invasive surgery and gastroenterology, where it was decided to perform a decortication of the right pleural effusion and exploration of the mediastinum for drainage, through emergency right thoracoscopy and intraoperative performance of upper digestive tract endoscopy, and according to the findings, possible ovesco, stent or endovac placement.

The surgical findings of the thoracoscopy were multiloculated right empyema secondary to suppurative mediastinitis due to a large infected and multiloculated mediastinal hernial sac, plus areas of mediastinal tissue necrosis and esophageal perforation. The procedure was performed without any immediate complications. The gastroenterology group performed an endoscopic esophageal stent placement, in the place where a 10 mm ulcer was observed in the distal esophagus, covered by fibrin, just above the Z line, with a subjective image of solution of continuity. Given the imminent risk of stent displacement, a central catheter passage was decided to start parenteral nutrition.

After this, the patient is transferred to the intensive care unit, where, given clinical and paraclinical parameters, it is established that the patient has sepsis of mediastinal origin with a sofa score of 2 points, for which it is decided to continue established antibiotic management and start of caspofungin, because of yeast growth in gram.

Given the stationary clinical evolution, a new thoracoabdominal CT scan was decided, in which esophageal perforation was found, with extra-luminization of the oral contrast in the distal third esophagus, just adjacent to the upper aspect of the esophageal stent, with a large paraesophageal mediastinal collection showing drainage catheter inside the esophagogastric lumen. Therefore, repositioning of the stent is requested by gastroenterology, and removal of the catheter.

Likewise, already with positive cultures of mediastinal secretion for *Candida albicans* and *Streptococcus vestibularis*; and positive tissue culture for *S. salivarius* and *Candida ciferrii*, adjustment of medical management was required by infectious diseases, with subsequent satisfactory evolution.

Due to the above, it was decided to transfer the patient to the floor with progressive clinical improvement, without fever spikes and without signs of systemic inflammatory response, however with increased mediastinal drainage as well as macroscopic changes. Consequently, he is taken to a new multidisciplinary meeting, where it is considered that he benefits from prosthesis removal plus E-VAC placement, with prior X-rays of the upper digestive tract where was observed extra-luminization of the oral contrast medium adjacent to the distal aspect of the esophageal stent, suggesting leakage towards residual hernia defect (Figure 1).

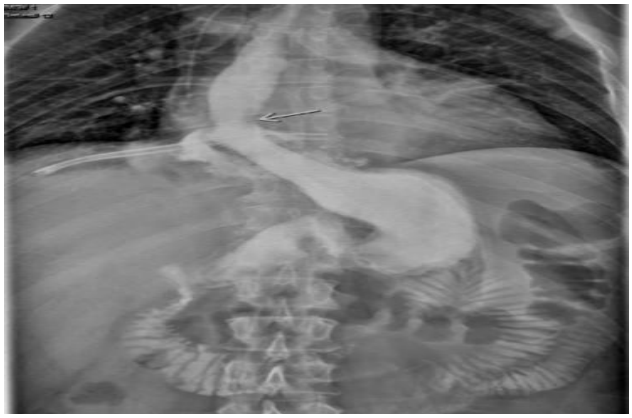

Figure 1: Upper GI tract radiograph showing extraluminization of oral contrast medium adjacent to the proximal aspect of the esophageal stent suggesting leakage into a residual hernial defect.

As a result, it was decided to perform a new upper digestive tract endoscopy with possible E-VAC placement. This shows a correctly positioned esophageal stent with no esophageal fistula. Similarly, ischemia of the gastric fundus with two orifices, one covered with fibrin and completely closed, and a very small one of 5 mm through which the mediastinal drain entered to the esophagogastric lumen (Figure 2), for which the placement of the negative pressure system at the level of the gastric fundus was decided based on endoscopic findings.

Figure 2: Endoscopic finding of the mediastinal drain with its tip inside of stomach.

The patient required replacement of the negative pressure system on three occasions, with improvement of symptoms and paraclinical results, so it was finally decided to perform an upper digestive tract endoscopy, which showed the absence of fistulous orifices in the fundus of the stomach and a scar in the third distal esophagus, with which it was decided to withdraw the E-VAC, and a new X-ray of the upper digestive tract where there was no evidence of extra-luminization of the contrast (Figure 3). Due to the above, the patient is discharged after adequate oral intake tolerance with warning signs and general recommendations.

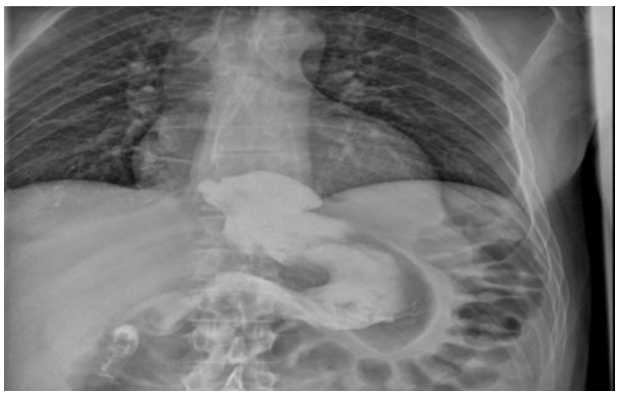

Figure 3: Upper GI tract X-ray showing no oral contrast leakage confirming adequate closure of the defect.

In the outpatient clinic after 2 weeks, he did not show any complications. No postoperative complications were documented after 30 days of follow-up. His controls have passed without incident up to 3 months.

DISCUSSION

Gastrointestinal defects, defined as the complete rupture of the gastrointestinal wall, can be classified into three categories including perforations, fistulas, and leaks.[2] Their incidence is increasing in clinical practice, which generates the need to develop not only new diagnostic algorithms but also new therapeutic methods. This has led to a paradigm shift from surgical to endoscopic therapy, which has become the first line of management.[3]

Endoscopic techniques have made significant progress in recent years, creating multiple treatment methods including clips, stents, and vacuum therapies. Vacuum therapy is increasingly being used due to multiple favorable outcomes, satisfactory safety profile, and successful adaptation to almost the entire gastrointestinal tract, mainly in the upper gastrointestinal tract, small intestine, biliopancreatic regions, and lower gastrointestinal tract.[2]

This endoscopic technique involves the positioning of a sponge, which is connected to a nasogastric tube and in direct contact with the cavity or defect.[4] The physiological mechanisms described through which healing occurs are five. The first mechanism is macrodeformation, generated by the suction force applied to the sponge, resulting in deforming forces on the edges of the wound, causing an approximation of the edges.[5] Similarly, microdeformation occurs, caused by all the mechanical changes that occur on a microscopic scale, directly affecting the cellular cytoskeleton, activating cellular cascades, releasing growth factors necessary for extracellular matrix expression and contractile elements.[6] The third mechanism is changes in perfusion caused by an increase in angiogenesis, mediated by temporary hypoperfusion, which translates into inducible hypoxia with subsequent increase in vascular endothelial growth factor expression.[7] Another mechanism through which proper healing occurs is exudative control, as a decrease and reduction in fluid accumulation reduces not only cellular but also vascular compression, increasing perfusion.[8] Finally, bacterial clearance is a mechanism that is still under discussion, as some studies have shown an increase or no change in bacterial load using this technique.[9,10]

Currently, the average duration of vacuum therapy treatment is 23 days, with indications for sponge replacement every third to fifth day. This was followed in the presented case, with a replacement every 5 days and a total treatment duration of 20 days.[4]

The efficacy of vacuum therapy in the treatment of transmural gastrointestinal defects is well reported in different studies and systematic reviews. The success rate is described to be between 84-100%, with an average of 90%.[11] Its success dates to the first published case in 2008,

where two patients with intrathoracic anastomotic leaks after esophagectomy were successfully treated without adverse events.[12] Additionally, Pournaras and colleagues conducted a series of 21 patients treated with Endo-Vac with a 95% healing rate and 3 to 12 sponge replacements.[13]

There are several cohort studies that compare the use of EVT with other techniques in the management of esophageal leaks.[14,15] In a retrospective analysis that compared EVT versus self-expandable stents (metal and plastic stents), the overall closure rate was 84.4% for EVT versus 53.8% for the stent group. These results were confirmed in a recent systematic review and meta-analysis, which showed that the rate of closure of the esophageal defect is significantly higher in EVT than in SEMS, with a shorter treatment duration, a lower rate of major complications, and lower hospital mortality.[15] These and many more results have made it possible to expand the indications for the use of the vacuum technique, but randomized controlled trials are still lacking to compare this vacuum technique with other surgical or endoscopic techniques.

On the other hand, it is significantly important to mention that this procedure has limitations when it comes to addressing defects larger than 5 cm and multiloculated collections.[16,17] Similarly, it should be noted that although it is a safe technique with a low rate of adverse events, minor and major bleeding events and anastomotic strictures have been reported.[13]

Furthermore, it is significant to emphasize the importance of multidisciplinary management, which includes surgeons, gastroenterologists, and interventional endoscopists, in achieving the best results for patients with gastrointestinal defects.

CONCLUSION

Endo-Vac therapy is currently a safe and effective technique for the treatment of transmural defects of the digestive tract. However, it is necessary to develop an algorithm based on the location, size of the defect, associated stenosis, infection, and available experience to reduce complications and possible adverse events. Finally, this technique should be developed in experienced centers, always accompanied by a multidisciplinary team and with the possibility of long-term follow-up.

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REFERENCES

1. Mauro MD, Escobedo-Paredes D, Hernandez-Guerrero A, Alonso-Larraga J, Gonzalez Saucedo A, Aguilar-Moreno R, et al. Endoscopic Vac in the Treatment of Collections and Extraluminal Cavity After Chronic Post-gastrectomy Fistula. Rev Endoscopia. 2020;32:149-50.
2. Moura D, Moura B, Bazarbashi AN, Ribeiro I, Moura E, Thompson C. Role of endoscopic vacuum therapy in the management of gastrointestinal transmural defects. World J Gastroenterol. 2019;11:329.
3. Goenka M, Goenka U. Endotherapy of leaks and fistula. World J Gastrointest Endosc. 2015;7:702-13.
4. Ramirez Barranco R, Garrido R, Escobar D. Terapia de vacío endoluminal (Endo-Vac) en el manejo de la fístula de anastomosis esofagogástrica. Rev Colomb Gastroenterol. 2022;37:83-89.
5. Panayi A, Leavitt T, Orgill D. Evidence based review of negative pressure wound therapy. World J Dermatol. 2017;6:1-16.
6. Saxena V, Hwang CW, Eichbaum Q, Ingber D, Orgill D. Vacuum-Assisted Closure: Microdeformations of Wounds and Cell Proliferation. Plast Reconstr Surg. 2004;114:1086-96.
7. Erba P, Ogawa R, Ackermann M, Adini A, Miele LF, Dastouri P, et al. Angiogenesis in wounds treated by microdeformational wound therapy. Ann Surg. 2011 b;253(2):402-9.
8. Lalezari S, Lee C, Borovikova A, Banyard D, Paydar K, Wirth G, et al. Deconstructing negative pressure wound therapy: Deconstructing NPWT. Int Wound J. 2016;14.
9. Braakenburg A, Obdeijn MC, Feitz R, van Rooij IA, van Griethuysen AJ, Klinkenbijl JH. The clinical efficacy and cost effectiveness of the vacuum-assisted closure technique in the management of acute and chronic wounds: a randomized controlled trial. Plast Reconstr Surg. 2006;118(2):390-7.
10. Patmo AS, Krijnen P, Tuinebreijer WE, Breederveld RS. The Effect of Vacuum-Assisted Closure on the Bacterial Load and Type of Bacteria: A Systematic Review. Adv Wound Care (New Rochelle). 2014;3(5):383-9.
11. Mennigen R, Senninger N, Laukoetter MG. Novel treatment options for perforations of the upper gastrointestinal tract: endoscopic vacuum therapy and over-the-scope clips. World J Gastroenterol. 2014;20(24):7767-76.
12. Wedemeyer J, Schneider A, Manns MP, Jackobs S. Endoscopic vacuum-assisted closure of upper intestinal anastomotic leaks. Gastrointest Endosc. 2008;67(4):708-11.
13. Pournaras DJ, Hardwick RH, Safranek PM, Sujendran V, Bennett J, Macaulay GD, et al. Endoluminal Vacuum Therapy (E-Vac): A Treatment Option in Oesophagogastric Surgery. World J Surg. 2018;42(8):2507-11.
14. Brangewitz M, Voigtländer T, Helfritz FA, Lankisch TO, Winkler M, Klempnauer J, et al. Endoscopic closure of esophageal intrathoracic leaks: stent versus endoscopic vacuum-assisted closure, a retrospective analysis. Endoscopy. 2013;45(6):433-8.
15. Rausa E, Asti E, Aiolfi A, Bianco F, Bonitta G, Bonavina L. Comparison of endoscopic vacuum

therapy versus endoscopic stenting for esophageal leaks: systematic review and meta-analysis. Dis Esophagus. 2018;31(11).
16. Leeds SG, Mencio M, Ontiveros E, Ward MA. Endoluminal Vacuum Therapy: How I Do It. J Gastrointest Surg. 2019;23(5):1037-43.
17. Ooi G, Burton P, Packiyanathan A, Loh D, Chen R, Shaw K, et al. Indications and efficacy of endoscopic vacuum-assisted closure therapy for upper gastrointestinal perforations. ANZ J Surg. 2018;88(4):E257-63.

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