Endoscopic management of colorectal anastomosis refractory leaks: a journey from conventional to inventive approaches

Diogo Turiani Hourneaux de Moura, MD, MSc, PhD,[1,2] Alexandre Moraes Bestetti, MD,[1,2] Saullo Queiroz Silveira, MD,[3] Marcela Viana Silva, RN,[1] Maria Luísa do Nacimento Moura, MD,[4] Pedro Henrique Loretti, MD,[5] Eduardo Guimarães Hourneaux de Moura, MD, MSc, PhD[1,2]

São Paulo, Brazil

Background and Aims: Postsurgical leaks are a dreaded adverse event of colorectal surgery. Traditional surgical approaches, including temporary ileostomy and revisional surgery, are the preferred methods for managing these challenging leaks. However, with the development of less-invasive techniques associated with lower morbidity, the combined use of temporary ileostomy and endoscopic therapies is on the rise. Although surgical management and endoscopic traditional therapies are often successful, alternative approaches are necessary when both approaches fail.

Methods: This is the first case report of a patient with a chronic colorectal anastomotic leak with an associated contained collection successfully treated with magnetic anastomosis to provide internal drainage.

Results: A 60-year-old man who underwent surgical treatment of a rectal adenocarcinoma presented with a dehiscence of the suture line with an associated contained collection. He underwent 2 surgical revisions and several conventional endoscopic therapies to treat this adverse event with no successful closure. Thus, endoscopic internal drainage with magnetic anastomosis followed by septotomy and endoscopic vacuum therapy for 1 week were successfully performed. At the 6-month follow-up, rectoscopy showed a normal rectal/colonic tubular shape without any signs of transmural defects and stenosis.

Conclusions: Endoscopic internal drainage is a safe and effective strategy for managing leaks associated with contained collections. After conventional techniques fail, the use of magnets for internal drainage by an anastomosis between the collection and the lumen appears to be an attractive option. This approach has the potential to enhance patient outcomes, improve quality of life, and reduce morbidity. Further research is required to validate our findings. (iGIE 2023;2:438-43.)

Postsurgical leaks are a dreaded adverse event of colorectal surgery.[1-3] Traditional surgical approaches, including temporary ileostomy and revisional surgery, are the preferred methods for managing these challenging leaks. However, with the development of less-invasive techniques associated with lower morbidity, the combined use of temporary ileostomy and endoscopic therapies, especially in tertiary centers, is on the rise.[4,5]

Endoscopic vacuum therapy (EVT) is considered the best endoscopic approach for colorectal anastomotic leaks because of its mechanism of action. EVT promotes drainage and accelerates healing, demonstrating a satisfactory safety profile and higher preservation of the anastomosis compared with conventional treatments such as tube placement, percutaneous drainage, endoscopic clipping, stent placement, and revisional surgery.[6-12] Although surgical management and EVT are often successful, alternative techniques become essential in cases where both approaches fail.

METHODS

We present the treatment journey of a patient with a chronic colorectal anastomotic leak. The patient underwent 3 revisional surgeries and several endoscopic therapies, including EVT, foreign body removal, EMR, septotomy, and endoscopic internal drainage (EID) using magnets.

Although magnet use has been described to create GI anastomosis and recanalization, to our knowledge, this is the first case report of EID performed with a magnetic anastomosis between the refractory associated collection and the colon. Two discoid magnets made of neodymium-alloy were used, with a

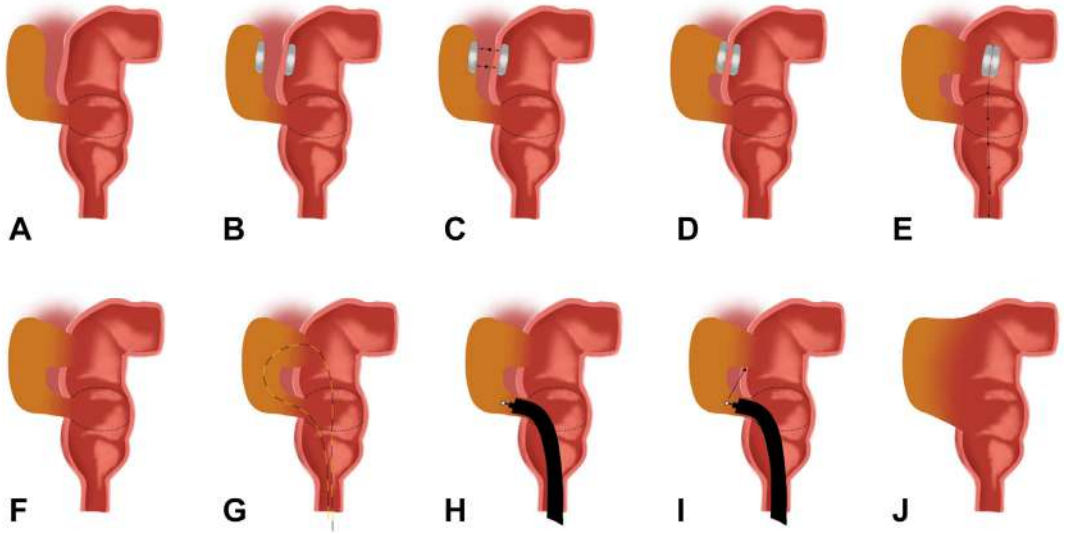

Figure 1. Illustration of the magnet anastomosis process. **A,** Colorectal anastomosis leak associated with a contained collection. **B,** Magnet placement, 1 within the proximal portion of the contained collection and 1 inside the colonic lumen. **C,** Strong connection between the two magnets. **D,** Because the associated collection was located parallel to the colon, attachment of the 2 magnets occurred. **E,** The strong connection between the 2 magnets promoted tissue ischemia, and the interconnected magnets migrated into the colon. **F,** An anastomosis connected the contained collection with the colonic lumen with a septum (colonic wall) between the colorectal and the magnet anastomosis. **G,** A guidewire was placed around the septum to enable septotomy. **H,** An electrocautery knife was used to perform septotomy. **I,** The septotomy created a complete communication of the associated contained cavity with the colorectal lumen. **J,** This approach turned the 2 compartments into 1, creating a neorectum.

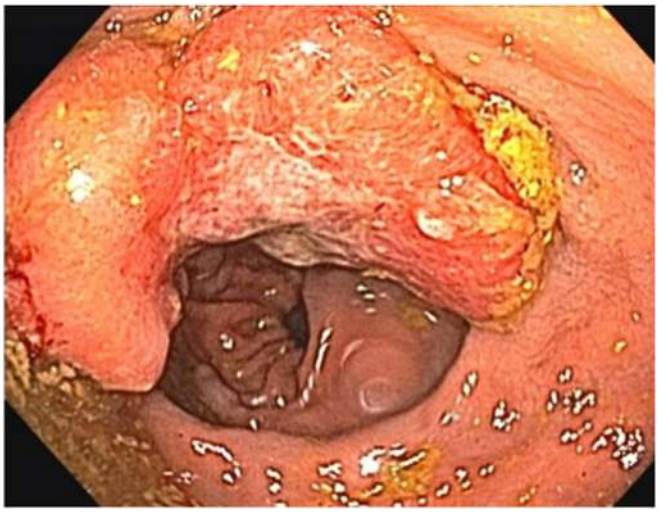

Figure 2. Rectal adenocarcinoma lesion diagnosed during colonoscopy.

16-mm outer diameter, 6-mm inner diameter, and 8-mm thickness (Magnetos Gerais Ímãs e Acessórios, Sao Paulo, Brazil).

The procedure was performed using endoscopic and fluoroscopic guidance. Placement of magnets was performed with a gastroscope and manual assistance. The first magnet was placed within the proximal portion of the contained associated collection and the other inside the colonic lumen. Because the associated collection was located parallel to the colon, the attachment of 2 magnets occurred. The strong connection between the 2 magnets promoted tissue ischemia and necrosis. After 10 days, complete necrosis was achieved, and the interconnected magnets migrated into the colon, turning the defect between the 2 compartments into an anastomosis (contained cavity and colon). This technique is detailed in Figure 1 and can be seen in Video 1 (available online at www.igiejournal.org).

RESULTS

Our case was a 60-year-old man who underwent robot-assisted local resection for a T2 rectal adenocarcinoma

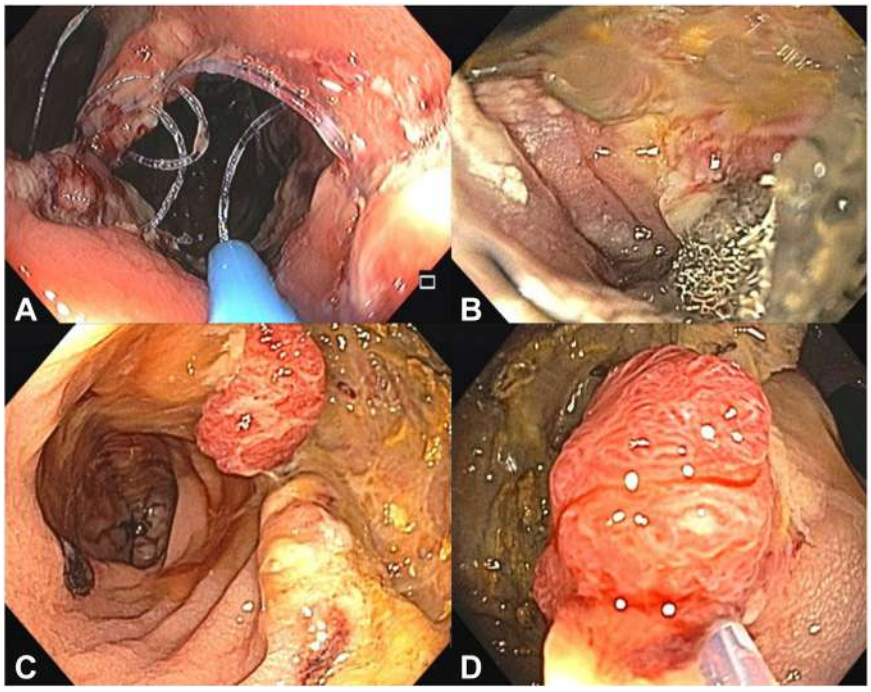

Figure 3. First endoscopic approach after surgical local resection of the malignant lesion complicated with a dehiscence of the suture line. **A,** Dehiscence of the suture line associated with a small contained collection. **B,** Intraluminal endoscopic vacuum therapy (EVT) placement. **C,** During the first EVT exchange session, a residual lesion was identified. **D,** EMR was performed to confirm malignance by histology.

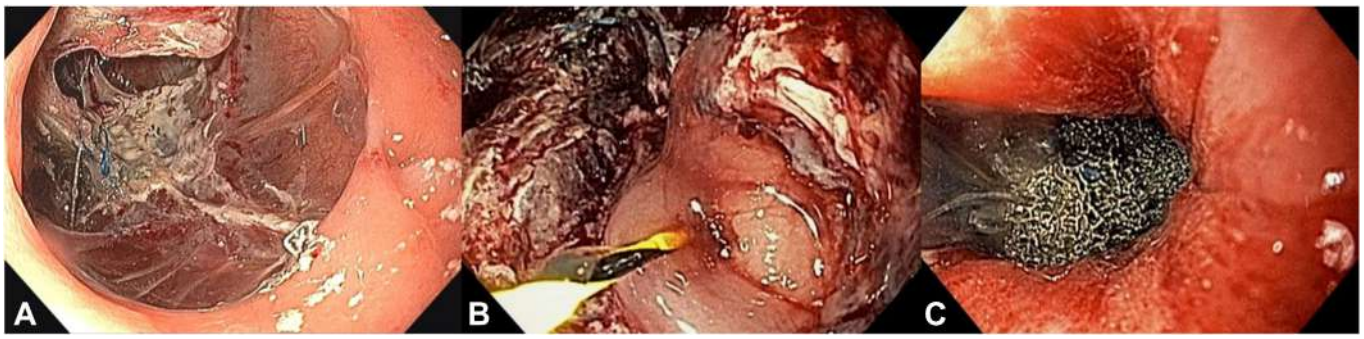

Figure 4. Complete dehiscence after revisional surgery and third surgical intervention with placement of preemptive endoscopic vacuum therapy (EVT) because of the high-risk anastomosis. **A,** Complete dehiscence of the colorectal anastomosis after the first revisional surgery. **B,** Preemptive EVT placement during the third surgical intervention because of the challenging location to perform a desired anastomosis. **C,** EVT with open-pore polyurethane sponge located inside the lumen of the anastomosis.

located 6 cm above the anal verge (Fig. 2). On postoperative day 17, he presented with fever and rectal pain. Rectoscopy diagnosed dehiscence of the suture line with a small (<3 cm) contained collection. Foreign body removal and intraluminal EVT were performed. After 1 week, granulation tissue and a persisting lesion were observed. An EMR was carried out (Fig. 3), and subsequent pathology analysis confirmed the presence of malignancy.

The patient underwent rectosigmoidectomy with temporary colostomy. Ten days later, he presented with fever, and rectoscopy revealed complete colorectal anastomosis dehiscence. Then, colonic transit reconstruction was performed, followed by anastomotic margin resection and reanastomosis. This novel anastomosis was highly challenging because of the short residual rectum (2 cm from the anal verge). Thus, a preemptive EVT followed by a protective ileostomy was performed (Fig. 4).

The patient showed no signs of infection as anticipated. A follow-up rectoscopy revealed initial granulation tissue surrounding the anastomosis. Despite initial improvement, the tissue later developed into a chronic defect, indicating incomplete healing (Figs. 5 and 6).

After the conventional therapies failed, EID with magnetic anastomosis was successfully performed (Fig. 7).

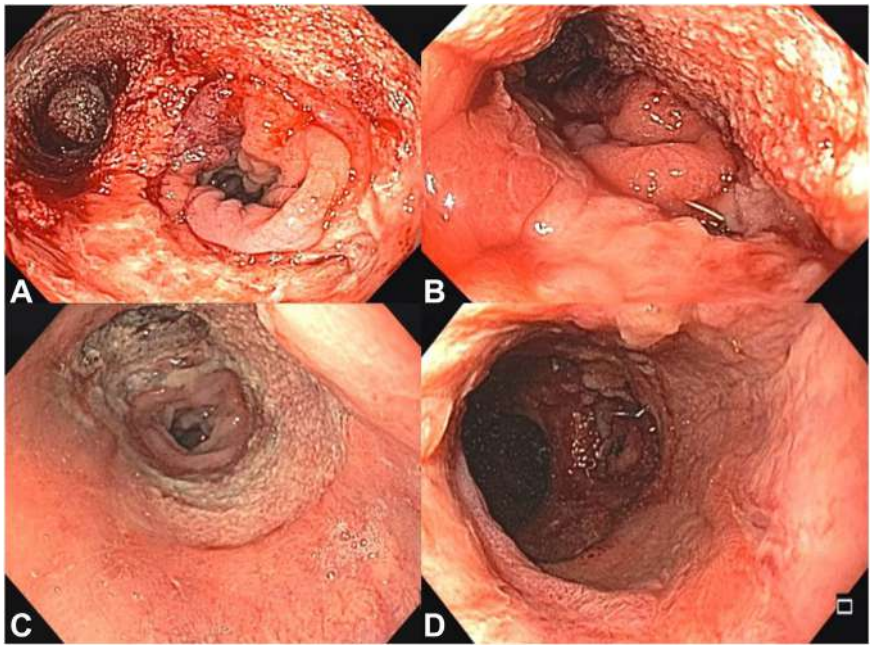

Figure 5. Granulation tissue after endoscopic vacuum therapy (EVT) with the traditional system (open-pore urethane sponge). **A,** Small perianastomotic-associated contained collection with a tubular shape similar to the EVT system. **B,** Granulation tissue observed in the residual rectum. **C,** Endoscopic appearance of an unusual granulation tissue chronification. **D,** Endoscopic image showing a chronic defect.

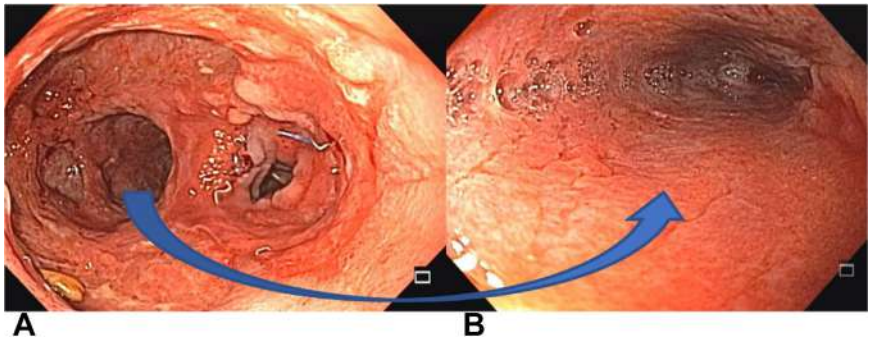

Figure 6. Chronic colorectal anastomotic leak with an associated contained collection. **A,** Chronic colorectal perianastomotic-associated contained collection. **B,** Endoscopic image of the chronic contained collection.

Subsequently, the 2 magnets were expelled, and rectoscopy revealed a large anastomosis. To merge the residual cavity and the colon lumen, septotomy was performed using a guidewire and electrocautery knife. Hemostasis was achieved with argon plasma coagulation. An intraluminal EVT was placed for 1 week to remodel the colorectal lumen (Fig. 8). After 15 days, a normal anatomy was observed, and transit reconstruction was performed. At the 6-month follow-up, rectoscopy showed a normal rectal/colonic tubular shape with only a flat healing ulcer occupying about 45% of the circumference without any signs of transmural defects and stenosis (Fig. 9).

DISCUSSION

Colorectal leaks require complex and multidisciplinary treatment and frequently the establishment of a temporary stoma. Furthermore, treatment failures, including endoscopic and surgical techniques, can lead to a permanent stoma. Therefore, innovative approaches are necessary.

EID is a widely recognized technique for draining pancreatic and other associated leak collections.[13-16] The use of magnets to create anastomosis with GI tract has been studied with promising results.[17,18]

After conventional techniques fail, the use of magnets for internal drainage by an anastomosis between the collection

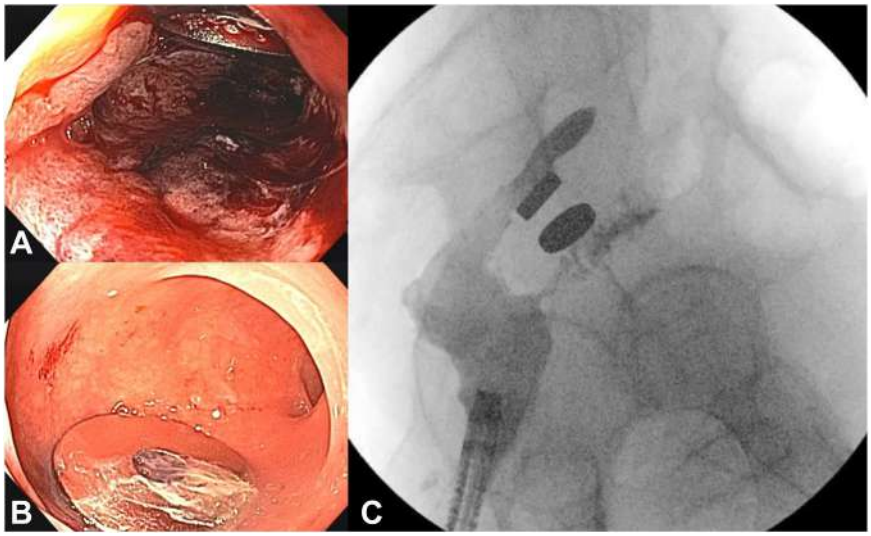

Figure 7. Magnets placement for the treatment of a chronic colorectal anastomotic leak with an associated collection. **A,** Magnet placed within the proximal portion of the perianastomotic contained collection. **B,** Magnet placed inside the colonic lumen. **C,** Fluoroscopic image showing the magnets parallel to each other for further attachment and anastomosis creation.

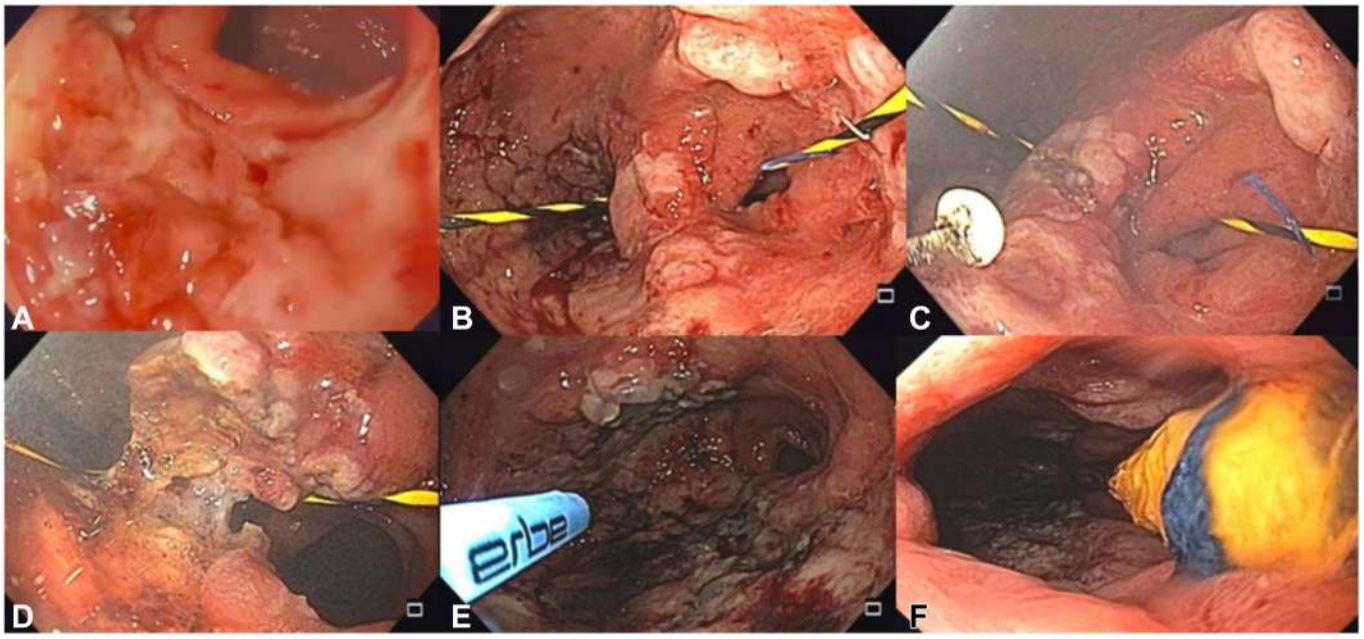

Figure 8. Anastomosis between the colon and the associated collection followed by septotomy and endoscopic vacuum therapy (EVT) for the creation of a neorectum. **A,** Anastomosis between the colon and the contained collection. **B,** Guidewire placement through the anastomosis, around the septum, to facilitate septotomy. **C,** Septotomy with an electrocautery knife. **D,** Endoscopic septotomy. **E,** Hemostasis with argon plasma coagulation after septotomy. **F,** Intraluminal modified EVT into the neorectum to improve healing and anatomy remodeling.

and the lumen appears to be an attractive option. This unique approach has the potential to enhance patient outcomes, improve quality of life, and reduce morbidity by avoiding permanent stomas. Further research is required to validate our findings.

DISCLOSURE

The following author disclosed financial relationships: E. G. H. de Moura: Consultant for Boston Scientific and Olympus. All other authors disclosed no financial relationships.

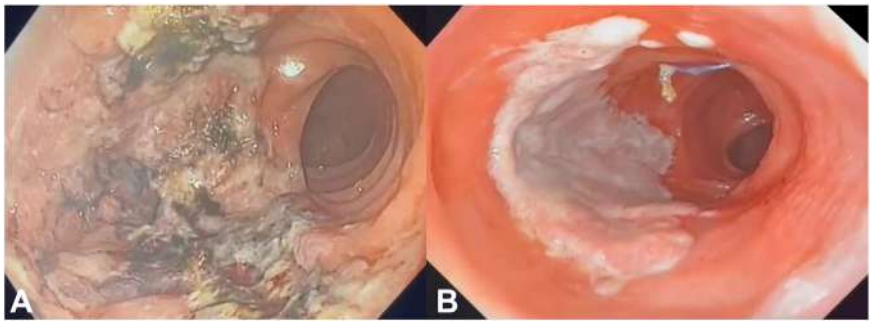

Figure 9. Endoscopic image after successful treatment of a complex postsurgical adverse event. **A,** Postendoscopic appearance after successful treatment of the chronic colorectal leak with an associated collection. **B,** Endoscopic appearance showing a functionally neorectum with a healing ulcer without signs of bleeding or transmural defect at 6-month follow-up.

Abbreviations: EID, endoscopic internal drainage; EVT, endoscopic vacuum therapy.

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Current affiliations: Gastrointestinal Endoscopy Division, Instituto D'Or de Pesquisa e Ensino, Hospital Vila Nova Star, São Paulo, Brazil (1), Gastrointestinal Endoscopy Unit, Department of Gastroenterology, Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo, São Paulo, Brazil (2), Anesthesiology Department-CMA, Instituto D'Or de Pesquisa e Ensino, Hospital Vila Nova Star, São Paulo, Brazil (3), Infectious Department, Instituto D'Or de Pesquisa e Ensino, Hospital Vila Nova Star, São Paulo, Brazil (4). Hospital Vila Nova Star, Instituto D'Or de Pesquisa e Ensino, São Paulo, Brazil (5).

Reprint requests: Diogo Turiani Hourneaux de Moura, MD, MSc, PhD, Gastrointestinal Endoscopy Division, Instituto D' Or de Pesquisa e Ensino (IDOR), Hospital Vila Nova Star, Rua Dr. Alceu de Campos Rodrigues, 126, 04544-000, Vila Nova Conceição, São Paulo SP, Brazil.

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