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Management of enteroatmospheric fistula using the FlexiSeal® system

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Abstract

Introduction: Enterocutaneous fistula (ECF) and enteroatmospheric fistula (EAF) remain sources of considerable morbidity and mortality. Diverting intestinal content is essential for patient optimization before definitive treatment in managing ECF/EAF. Here, we describe a modified innovative technique for effluent control using Flexi-Seal® Fecal Management System (FMS®) in a highly complex ECF/EAF.

Patient and Methods: Male, 56 years old. After performing several abdominal surgeries. The patient had a complex uncontrolled EAF/ECF that was not solved, although we tried varied methods.

Results: The most proximal fistulous orifice was identified manually in the operating room, and the FMS® tube was introduced into the intestinal lumen. We obtained a clear improvement after controlling intestinal discharges. So, we were able to perform a small bowel resection and close the abdominal wall. Postoperative evolution was favorable, and the patient was discharged 92 days after admission.

Conclusion: Our technique using the FMS® device serves as a valuable tool for effluent control in patients presenting with complex ECF/EAF. It is clinically effective and less labor-intensive than other methods. It should not perhaps be used as the first option but should be kept in mind for complex fistulas treated unsuccessfully with other methods.

Keywords: enteroatmospheric fistula, enterocutaneous fistula, acute care, surgery

Despite nutritional care, infection control, and advances in surgical technique, enterocutaneous fistula (ECF) and entero-atmospheric fistula (EAF) remain a source of considerable morbidity and mortality [1-3]. In managing ECF/EAF, the diversion of intestinal content is essential for patient optimization before definitive treatment [1-3]. Effluent control in the fistula is a crucial issue. Here, we describe a modified innovative technique for effluent control using Flexi-Seal® Fecal Management System (FMS®) in a highly complex ECF/EAF.

A male, 56 years old, with a previous history of hypertension and a body mass index of 45, was found in a public street with an impaired level of consciousness and seizures. He was intubated and transferred to our center. With the possible diagnosis of heat stroke, he was admitted to the ICU. At ten days, he presented clinical

worsening and abdominal pain. Abdominal CT revealed ischemic colitis in the right colon. He underwent a right hemicolectomy with manual side-to-side anastomosis. After five days, he presented elevated intra-abdominal pressure >20 mmHg and surgical wound infection. During wound debridement, complete evisceration was observed, and the continuous suture of the abdominal closure was also seen to cause severe damage in several intestinal loops. The patient underwent reintervention with the placement of IPOM® mesh and VAC® system. Evolution was sluggish with leakage of intestinal content through the surgical wound due to the presence of several difficult-to-manage EAFs. The patient was attended daily in the operating room under general anesthesia, and a variety of mechanisms (VAC® system, bottle nipples, and gastrostomy tubes) were used to control EAF without success [Figure 1 A-D]. Due to the observation of new fistulous orifices, VAC® was discontinued. Given the poor evolution, we decided to use the technical variant we present here. In the operating room, under general anesthesia and in aseptic conditions, the most proximal fistulous orifice was identified manually, and the FMS® tube was shortened so as not to introduce the balloon into the intestinal lumen. The fistulized loop was sutured to the collection tube with a 3/0 resorbable monofilament and connected to the collection bag. We obtained a clear improvement and performed progressively a skin closure, leaving the proximal tutored loop exteriorized [Figure 2 AB]. We changed FMS® every 7-10 days (3 times). In the last change, we filled the balloon (only 20 ml) to prevent it from exiting from the intestinal lumen. After improvement in the patient's condition and nutritional optimization, we performed a third laparotomy with a laborious adhesiolysis, resection of a meter of small intestine encompassing all the fistulous tracts, and manual end-to-end anastomosis. The wall was closed using the component separation technique. Postoperative evolution was favorable, except for surgical wound infection, and the patient was discharged 92 days after admission.

ECF is an abnormal communication between the intestinal lumen and the skin. It can be classified according to the organ/organs affected, the etiology, or the debit [1-3]. The mortality rate associated with ECF is reported to be 4.8–20% [1-3]. Its incidence has decreased due to surgical techniques, nutritional improvement, and infection control improvements.

Control of fistula effluent is essential for successful healing in an established ECF or EAF. Many methods have been described for effluent control of enteric fistulas, including negative-pressure wound therapy, stoma bag use, catheter drainage, fistuloclysis, fistula patch, and stents [1-3]. In these patients, inserting a stoma bag to control the fistula is often impossible due to the lack of epidermal tissue needed to apply the appliance. Sometimes, ECF/EAF is uncontrollable.

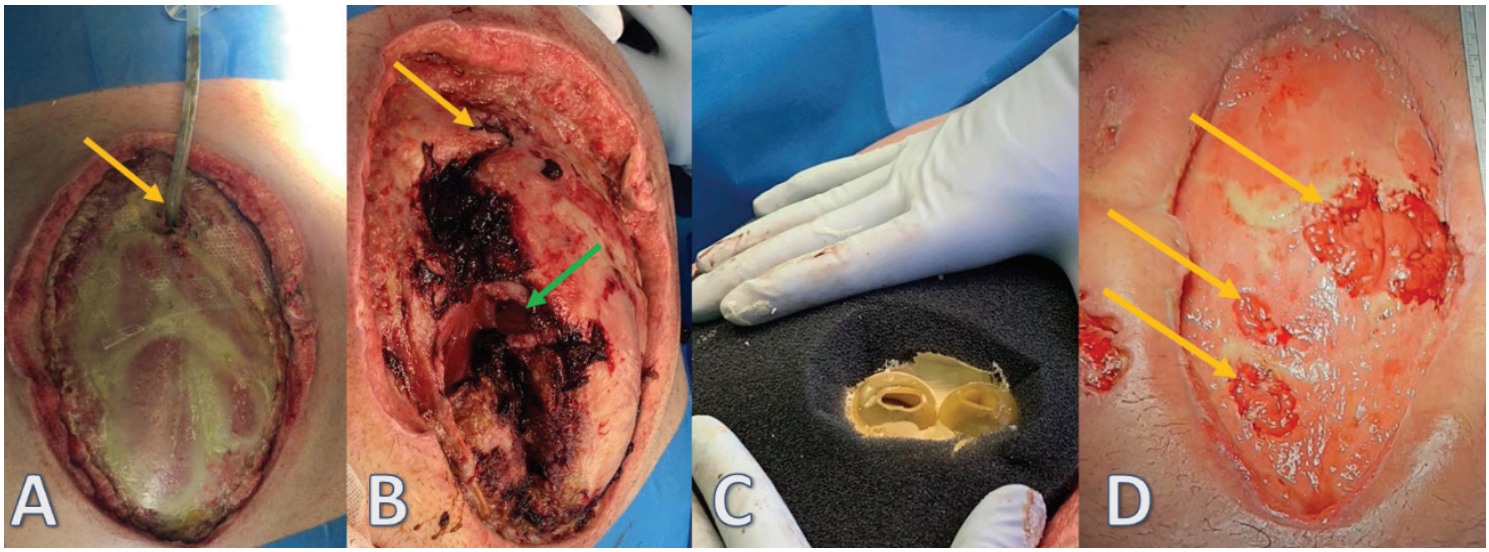


Figure 1: Stages of the ECF with devices used.
Figure 1A: ECF was tutored with a gastrostomy tube and the VAC® system.
Figure 1B: Burst intestine after VAC. ECF previously guided with gastrostomy tube (yellow arrow), new ECF (green arrow).
Figure 1C: ECF tutorized guided with bottle nipples and VAC® system.
Figure 1D. Several ECF.

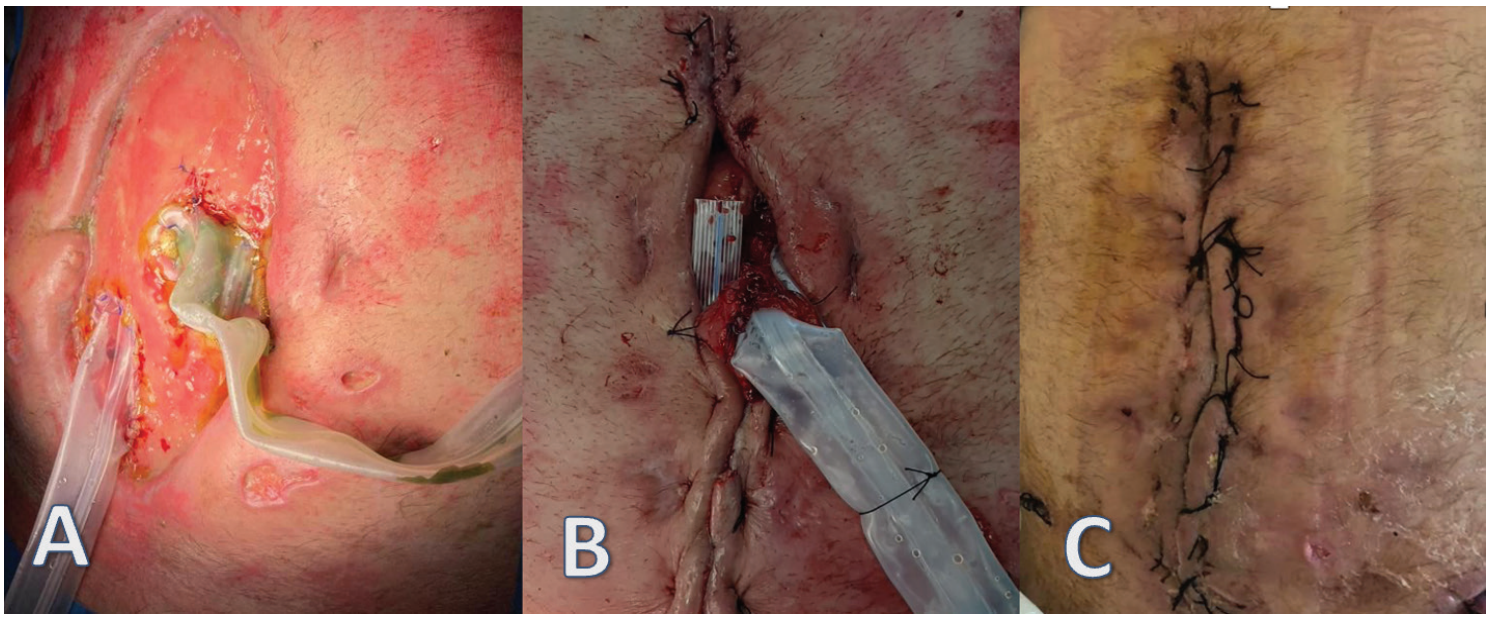


Figure 2: Treating ECF with Flexi-Seal®
Figure 2A: Flexi-seal® system, sutured to the intestinal lumen.
Figure 2B: Balloon already inserted into the intestinal lumen with 20mL of SF.
Figure 2C: After third laparotomy

The Flexi-Seal® Fecal Management System (FMS®) (Convatec, Rhymney, UK) consists of a 23 mm soft silicone catheter approximately 1 meter long with a retention balloon at one end. It is a temporary containment device useful for incontinent patients with liquid-type stool and bedridden patients [1,2].

Two reports (including six patients) have been published on the use of FMS® for controlling fistula effluent. Our technique is based on the descriptions in these papers but also on the procedure presented by Rivera et al., who described the suture of latex splints to fistulous orifices, highlighting their ease of use, versatility, practicality, and reproducibility [4]. We think that cutting the balloon and suturing the FMS® to the fistulous orifice following Rivera's technique has several advantages, including fewer accidental movements, more excellent water tightness, allowing faster healing, and using FMS® associate the collection bag with the filter, thus improving the sealing of the system [1,2,4]. A residue-free diet is recommended to make the intestinal content as liquid as possible, avoiding obstructions in the collector lumen.

The advantages of the technique with FMS® are: the fistula can be externalized in a sealed manner, thus obtaining a better quantification of the fistula output and re-establishing nutritional status; it is suitable for use with large fistulas between 20–40 mm due to the dimensions of the tube, which permits the diversion of both liquid and semi-liquid bowel contents and can be applied in patients not on bowel rest; the lower frequency of performing cures, which increases patient comfort and is convenient for healthcare personnel; finally, other devices can be used simultaneously, although in our case we did not use other devices given the poor results reported previously [1,2].

The technique's disadvantages include the requirement for general anesthesia for its placement, the need for the patient to be transferred to the operating room each time a change is required, the need for careful handling of the device by the patient and health personnel, and the perpetuation of ECF. It should only be considered a bridge to definitive surgery, not to resolve the condition.

In conclusion, our technique, using the FMS® device, is a valuable tool for effluent control in patients presenting with complex ECF/EAF. It is clinically effective and less labor-intensive than other methods. It should not perhaps be used as the first option but should be kept in mind for complex fistulas treated unsuccessfully with other methods.

Declaration of interest: None
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The patient's written consent was obtained.

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