Volume 6, No. 11 November, 2025
p ISSN 2723-6927-e ISSN 2723-4339

Managing Cecal Enterocutaneous Fistula Through Application of Cecostomy Tube: An Effective Approach

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ABSTRACT

Enterocutaneous fistula (ECF) following appendectomy is a rare but serious complication. This case report describes the effective management of a cecal ECF in a 12-year-old boy who presented with fecal discharge from a right lower abdominal surgical scar 2.5 years after an appendectomy. Clinical examination revealed an ECF opening with mucosal prolapse. Fistulography confirmed a fistula tract originating from the proximal ascending colon. Surgical exploration identified the fistula at the cecum, arising from the appendiceal stump. The management involved excision of the fistula tract, primary closure of the cecal defect, and insertion of a cecostomy tube. A key technical aspect was the placement of the tube tip approximately 15 cm proximal to the ileocecal junction within the terminal ileum. Postoperatively, the patient recovered well, tolerated a regular diet, and was discharged. The cecostomy tube was removed on the 14th postoperative day during an outpatient visit. Follow-up confirmed complete healing with no evidence of leakage or fistula recurrence. This case demonstrates that fistula excision with primary suture, augmented by a strategically placed cecostomy tube for decompression and diversion, can be a successful surgical strategy for cecal ECF. This approach preserves cecal function, mitigates pressure on the suture line, and avoids the need for a formal stoma, offering a viable alternative in select cases.

Keywords: appendectomy; cecostomy; enterocutaneous fistula; cecum.

INTRODUCTION

Enterocutaneous fistula (ECF) following appendectomy is an uncommon but serious complication, associated with significant morbidity and prolonged hospitalization (Gefen et al., 2022). While the overall incidence of ECF after abdominal surgery is estimated to be less than 2%, its occurrence specifically related to an appendiceal stump or cecal pathology is exceedingly rare, representing a unique clinical challenge (Härle, 2023). [1–3] An ECF is defined as an abnormal communication between the gastrointestinal tract and the skin. Postoperative ECFs most commonly arise from inadvertent enterotomy, anastomotic leakage, or ischemia, often exacerbated by underlying conditions such as malnutrition, infection, or inflammatory processes (Guyton et al., 2016).[4],[5]

The management of ECF typically involves a combination of conservative measures—including nutritional support, infection control, and wound care—and surgical intervention (Ghimire, 2022). Surgical options range from simple fistula excision and primary closure to more extensive procedures such as bowel resection with anastomosis or even right hemicolectomy in cases involving the cecum (Almughamsi & Elhassan, 2025).[6],[7] However, the optimal surgical strategy for cecal ECF remains poorly defined due to the rarity of the condition and the lack of comparative studies (Group: et al., 2016).

Cecostomy tube placement is a recognized but infrequently employed technique in this context (Khan et al., 2015). Its limited use is often attributed to concerns regarding inadequate fecal diversion, high tube occlusion rates, and potential complications such as leakage or pericatheter infection (Chow et al., 2023).[8],[9] Consequently, its role in the management of cecal ECF has not been well-established in the literature, creating a significant gap in evidence-based surgical guidelines (Irani et al., 2023).

Despite these concerns, cecostomy tube insertion offers several theoretical advantages in selected cases (Li et al., 2018). It facilitates cecal decompression, reduces intraluminal pressure at the repair site—adhering to the principles of Laplace's law—and may thereby promote healing while minimizing the risk of suture line breakdown.[10],[11] This approach also avoids the morbidity and psychological impact associated with a diverting ileostomy, particularly in pediatric patients. Therefore, this case report aims to illustrate the technical feasibility and clinical outcome of cecostomy tube application as an alternative surgical modality for managing a post-appendectomy cecal ECF, highlighting its potential benefits in a carefully selected patient.

METHOD

Case Presentation

A 12-year-old boy with a history of appendectomy surgery 2.5 years ago with complaints of feces coming out of the scar of lower right abdominal surgery experienced since 7 days after the surgery. Two weeks before entering the hospital, we had complaints of intestinal mucosa coming out of the hole of the enterocutaneous fistula. From the physical examination, the general state of the patient is quite good, with vital signs within normal limits. Physical examination of the abdomen appeared flat, there was an opening fistula accompanied by mucosal prolapse of the intestine in the lower right abdomen, visible bowel loop and visible bowel peristaltic were not found, normal bowel sound, soft palpation and tympanic percussion. The laboratory examination, indicators were found within normal limits, no signs of infection were obtained.

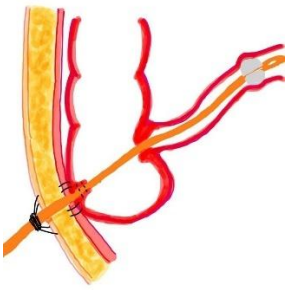
Figure 1. Clinical photos. Visible surgical scars and opening fistula accompanied by mucosal prolapse of the intestine in the lower right abdomen
Source: Author's Medical Archive, 2023

Then we do a supporting diagnosis, fistulography showing an enterocutaneous fistula in the right lower abdomen coming from the proximal colon ascendens.

Figure 2. Fistulography. showing an enterocutaneous fistula in the right lower abdomen coming from the proximal colon ascendens.
Source: Hospital Radiology Archive, 2023

Surgery was performed by exploratory laparotomy, it was found that the EC fistula in the cecum came from the appendix stump. Fistula excision was performed, a cecum defect diameter of 2 cm was obtained, then followed by primary suture and installation of a cecostomy tube using a 14fr or 16fr silicone catheter with the end of the hose placed at 15-20 cm proximal illeocaecal junction. Then the fixation of the cecum on the peritoneal wall of the right lower abdomen.

A



B

C

Figure 3. Photos of Operation. A. Primary suture and installation of a cecostomy tube using a 14fr or 16fr silicone catheter with the end of the tube placed at a 15 cm proximal illeocaecal junction. **B.** Then the fixation of the cecum on the peritoneal wall of the lower right abdomen. **C**. The cecostomy tube is placed in a new incision in the lower right side of the abdomen and fixed with sutures

Source: Author's Surgical Documentation, 2023

During the postoperative care period, the patient was in a stable state, free feeding began on the first day of postoperative surgery, and the surgical wound did not get infected. The cecostomy tube is maintained, the patient can be outpatient on the 5th day postoperatively. The cecostomy tube was removed on the 14th day after surgery at the outpatient polyclinic. During the follow-up, no leakage or recurrent fistula was found

Figure 4. Photo Followup. The cecostomy tube was removed on the 14th day after surgery at the outpatient polyclinic. During the follow-up, no leakage or recurrent fistula was found
Source: Author's Medical Archive, 2023

RESULT AND DISCUSSION

In surgical textbooks, it is said that enterocutaneous (EC) fistulas are described as a surgical tragedy or disaster for surgeons and patients. Most EC fistulas occur after abdominal surgery and only 15 – 25% of spontaneous EC fistulas are the result of an underlying disease. We need to know that the goal of EC fistula management in general is to restore gastrointestinal (GI) continuity and allow enteral nutrition with minimal morbidity and mortality. Therefore, a Step-by-Step approach is recommended to achieve this goal.[5-8]

EC fistula is important to identify, anatomical information is the most important to predict the location of the intestinal opening and assess its need for surgery. The presence of components in the EC fistula is an indication for surgical intervention. However, surgery should be performed only after sufficient time has been given to restore the patient's overall condition and allow lysis of intra-abdominal adhesions from previous surgeries i.e. the patient's systemic condition is conducive to major surgery. In the study, Evenson and Fischer said they waited at least four months from the time of the previous surgery. Meanwhile, Datta et al., postponed surgery for an average of nine months from the initial surgery or the occurrence of a fistula. The definitive surgery time should be adjusted to the patient's characteristics.[5,9,10]

The goal of surgery for EC fistula is to refunction the entire intestine, resection the fistula with anastomosis and secure the closure of the abdominal wall.[5] However, studies on the surgical treatment of EC fistula in the cecum have been very rare to date. Therefore, the management of surgical techniques on cecum perforation can be analogized to this case. The choice of surgical techniques for EC fistula on the cecum/perforation of the cecum (defect) varies greatly :

1. Primary suture with or without omental patch or by attaching to the right lateral wall of the abdomen
2. Primary closure using a stapler
3. Primary suture with stoma protection (diversion ileostomy)
4. Cecal resection followed by anastomosis illeocolon
5. Or even with a very massive action, namely the right hemicolectomy, which of course with the right and appropriate consideration of indications and assessments

In this case, surgical management is carried out excision/resection of the fistula followed by primary suture and by inserting a cecostomy tube whose end of the tube is placed on the terminal ileum through the Ileocaecal junction (ICJ). The cecum is maintained with considerations in addition to vital and viable assessment, the cecum has the function of receiving chyme, vestigial containing lymphoid tissue, absorption of water, salts, vitamins and minerals and excreting mucus from its epithelium. Morphologically, the cecum microarchitecture consists of mucosa, submucosa, and muscular (inner circular and outer longitudinal) layers with a thin outer serosal covering. In addition, the cecum is supplied by the anterior and posterior caecal arteries, which are branches of the ileocholic artery of the superior mesenteric artery and the arterial supply to the cecum is not as rich as the rest of the intestine. Cecum is also called by the spelling caecum derived from the Latin word caecus which means caecus (blind sac) and anatomically the valvula ICJ is located in the cecum so that high pressure/turbulence occurs in the cecum space due to the release of contents from the small intestine. This mechanism is also known as "Laplace's Law".[13-14]

From the description above, actions that are only with the primary suture of a large enough (>1cm) cecum defect have the potential to cause leakage. Therefore, a diversion action is needed with the purpose of protecting to reduce the pressure/turbulence that occurs in the cecum space.

Rob and Smith's in their surgical book on tube caecostomy say, "In general, a cecostomy tube is rarely used because it is considered not to divert feces and the tube tends to become easily clogged.[11] In this case as a diversion we use a cecostomy tube with the end of the tube placed on the terminal ileum past the ileocaecal junction (+/- 15-20cm). The tube uses a silicone catheter size of 14fr or 16fr and a catheter balloon is developed 5-10cc according to the tension of the illeum so that ischemic and necrosis do not occur at that point. This goal is so that the contents of the small intestine that are still liquid can easily enter the tube before flowing to the cecum space and reduce the pressure and turbulence that can occur in the caecum space. We did not apply stoma diversion due to consideration of the potential for stoma complications that may occur such as retracted, prolapse, seroitis, and avital stoma. In addition, there is also a considerable cost of periodic stoma treatment (consumables), the cost of follow-up surgery (stoma closure/reanastomosis), as well as the child's psychological consideration of repeated surgery (psychological trauma) and minimizing the stress of anstesia for the body. With the use of a cecostomy tube, it reduces the length of hospitalization because monitoring can be done on an outpatient (polyclinic). The care education delivered is simpler than the independent care education/discipline of stoma care.[12]

Removing the fistula tube between the cecum and the anterior abdominal wall should be well formed within 10-14 days. The retaining sutures on the abdominal wall must be removed and the balloon deflated. As long as there is no distal blockage in the intestine, the

hole will be closed.[11] Literally, the application of this cecostomy tube insertion is like creating a fistula but the fistula that is controlled with a track is physiologically created with the hope that when the tube is removed, the abdominal wall such as muscles (muscle fibers) and soft tissues (fat) can cover the peritonium parietal hole and the intestinal wall of the cecostomy tube until the wound heals (closes). In this case, we removed the tube on the 14th day postoperatively and performed it at an outpatient polyclinic. During the follow-up, no leakage or recurrent fistula was found and the wound of the tube hole closed completely on the 30th day after surgery.

CONCLUSION

This case is rare and the literature on handling it is still very limited. Therefore, this requires individual handling. The application of a cecostomy tube with the end of the tube placed on the terminal ileum can be an alternative to surgical therapy in the surgical management of EC fistula in the cecum. Further studies with serial cases and/or limited research on the comparison of operational management techniques in looking at outcomes and levels of complications are needed.

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