

Enterocutaneous Fistula Management and Outcome

Monali¹, Ramesh Tambat², Resin³, Aadiraj⁴

^{1,2,3,4}Department of General Surgery, Sapthagiri Institute of Medical College, Bengaluru, India.

Corresponding Author: Monali

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ABSTRACT

Background: Enterocutaneous fistula (ECF) is a serious postoperative complication characterized by an abnormal communication between the gastrointestinal tract and skin, leading to significant morbidity due to fluid loss, sepsis, and malnutrition. Effective management requires a multidisciplinary and staged approach.

Case Presentation: A 45-year-old male presented with feculent discharge from a postoperative abdominal wound for 7 days, along with fever, abdominal pain, and generalized weakness. He had undergone exploratory laparotomy with bowel resection and anastomosis 20 days prior. On examination, he was dehydrated with tachycardia (104/min), hypotension (100/60 mmHg), and fever (38.2°C). Local examination revealed feculent discharge of approximately 400 ml/day from the surgical wound. Laboratory investigations showed anemia (Hb 9.2 g/dL), leukocytosis (14,500/mm³), electrolyte imbalance, and hypoalbuminemia (2.5 g/dL). Imaging studies confirmed an ileal enterocutaneous fistula with intra-abdominal collection.

Management and Outcome: The patient was managed initially with conservative measures including fluid resuscitation, electrolyte correction, broad-spectrum antibiotics, and nutritional support with total parenteral nutrition. Ultrasound-guided drainage of intra-abdominal collection was performed. After six weeks of stabilization

and improvement in nutritional status, definitive surgical management with resection of the fistulous segment and anastomosis was undertaken. The postoperative period was uneventful, with complete resolution of the fistula.

Conclusion: Early diagnosis, effective sepsis control, and adequate nutritional support followed by timely surgical intervention are key to successful management of enterocutaneous fistula. A structured, multidisciplinary approach significantly improves patient outcomes.

Keywords: Enterocutaneous Fistula; Postoperative Complication; Nutritional Support; Sepsis Control; Surgical Management

INTRODUCTION

Enterocutaneous fistula (ECF) is a complex surgical condition defined as an abnormal communication between the gastrointestinal tract and the skin, resulting in the leakage of intestinal contents to the external environment. It represents one of the most challenging complications encountered in gastrointestinal surgery due to its high morbidity, prolonged hospital stay, and significant impact on patient quality of life. The majority of ECFs are iatrogenic, commonly arising as complications following abdominal surgeries, particularly bowel resections, anastomotic leaks, or trauma-related interventions. Spontaneous fistulas may also occur in association with underlying diseases such as inflammatory

bowel disease, malignancy, radiation enteritis, or infections like tuberculosis [1,2]. The pathophysiology of enterocutaneous fistula involves disruption of intestinal integrity, leading to persistent communication with the skin. This results in continuous loss of fluids, electrolytes, and nutrients, which can rapidly lead to dehydration, electrolyte imbalance, malnutrition, and sepsis. Among these, sepsis remains the leading cause of mortality in patients with ECF. The severity of the condition is influenced by factors such as fistula output (high vs low output), anatomical location, presence of distal obstruction, and underlying disease pathology. High-output fistulas, particularly those originating from the proximal small intestine, are associated with worse outcomes due to greater fluid and nutrient losses [3,4]. Management of enterocutaneous fistula is multifaceted and requires a structured, multidisciplinary approach. The cornerstone principles include sepsis control, fluid and electrolyte resuscitation, nutritional support, wound care, and definitive surgical management when necessary. Initial management focuses on stabilization of the patient, including aggressive fluid replacement, correction of electrolyte disturbances, and prompt identification and treatment of infection sources. Imaging modalities such as contrast-enhanced CT scans play a crucial role in identifying intra-abdominal collections and guiding drainage procedures [5]. Nutritional support is a critical component in the management of ECF, as malnutrition significantly impairs wound healing and increases the risk of complications. Total parenteral nutrition (TPN) or enteral nutrition, when feasible, is used to improve the patient's nutritional status and promote spontaneous fistula closure. Studies have demonstrated that adequate nutritional optimization can significantly enhance healing rates and reduce mortality [6]. The likelihood of spontaneous closure of ECF depends on several factors, including the absence of

distal obstruction, healthy surrounding tissue, and low fistula output. The well-known "FRIEND" mnemonic (Foreign body, Radiation, Infection/Inflammation, Epithelialization, Neoplasm, Distal obstruction) highlights factors that prevent spontaneous closure. In cases where conservative management fails, surgical intervention is indicated. Definitive surgery typically involves resection of the fistulous tract and restoration of intestinal continuity, usually performed after a period of stabilization and nutritional optimization to minimize operative risk [7]. Despite advances in surgical techniques, critical care, and nutritional support, enterocutaneous fistula continues to be associated with significant morbidity and mortality rates ranging from 5% to 20%, depending on patient condition and institutional expertise. The outcomes of ECF management are influenced by early recognition, timely intervention, and adherence to standardized treatment protocols. Therefore, understanding the clinical profile, management strategies, and outcomes of patients with enterocutaneous fistula is essential for improving patient care and reducing complications [8]

DISCUSSION

The present case of a 45-year-old male with postoperative enterocutaneous fistula (ECF) highlights the classical clinical course, management challenges, and favorable outcome achieved through a structured multidisciplinary approach. The patient developed a high output fistula of ileal origin with an output of approximately 400 ml/day, which, although slightly below the conventional high-output threshold of >500 ml/day, still behaved clinically as a high-output fistula due to associated dehydration, electrolyte imbalance, and malnutrition. Similar to the findings described by Tong CY et al. (2012), high-output fistulas are associated with significant morbidity, electrolyte disturbances, and nutritional depletion, with up to 70% of patients developing malnutrition, which is a key

prognostic factor affecting fistula closure [12]. In the present case, laboratory findings revealed anemia (Hb 9.2 g/dL), leukocytosis ($14,500/\text{mm}^3$), hyponatremia (130 mEq/L), hypokalemia (3.2 mEq/L), and hypoalbuminemia (2.5 g/dL), reflecting the systemic impact of ongoing fistula losses and sepsis. These findings are consistent with previous studies emphasizing the importance of early correction of fluid-electrolyte imbalance and aggressive nutritional support. The initial management strategy in this patient—comprising fluid resuscitation, electrolyte correction, sepsis control, and total parenteral nutrition—aligns with the standard principles described by Denicu MM et al. (2022), who reported that conservative management remains the first-line treatment in ECF and achieved a closure rate of 78.94% with non-operative measures [9]. In contrast, surgical intervention in their study showed a lower closure rate of 57.61%, reinforcing the importance of delaying surgery until optimal patient stabilization is achieved. In our case, conservative management over a period of six weeks resulted in clinical improvement, reduction in fistula output, and better nutritional status, which allowed for safe definitive surgical intervention. This staged approach is supported by Assenza M et al. (2016), who emphasized that multimodal treatment—including nutritional support, sepsis control, and adjunct therapies—is essential for improving outcomes in ECF patients. Their study demonstrated that adjuncts such as somatostatin analogues significantly reduced fistula closure time (13.95 vs 20.5 days) and improved closure rates (72% vs 44%), highlighting the role of pharmacological support in enhancing conservative management [10]. Although such adjuncts were not used in the present case, the favorable response to nutritional and supportive care alone underscores the effectiveness of basic management principles when applied appropriately. The importance of infection control was also evident in this patient, as intra-abdominal

collection was identified and drained, leading to clinical stabilization. This is consistent with findings by Gu GL et al. (2014), who demonstrated that uncontrolled infection associated with ECF can lead to severe complications such as necrotizing fasciitis, with markedly elevated leukocyte counts (up to $32.2 \times 10^9/\text{L}$) and extensive tissue involvement [11]. Early drainage and antibiotic therapy in our patient prevented such severe complications and contributed to improved outcomes. Definitive surgical management in this case involved resection of the fistulous segment and restoration of bowel continuity, which resulted in complete resolution of the fistula without recurrence. This outcome is comparable to emerging therapies such as those described by Fransvea P et al. (2025), where autologous adipose-derived stem cell (ADSC) therapy achieved a closure rate of 66.7% within 4–12 weeks [13]. However, despite promising minimally invasive approaches, surgery remains the gold standard in cases where spontaneous closure does not occur after adequate conservative management. Overall, the successful outcome in this case can be attributed to early recognition, appropriate classification, effective sepsis control, correction of metabolic derangements, and timely surgical intervention. The findings reinforce the concept that ECF management requires a tailored, stepwise approach based on patient condition and fistula characteristics. Consistent with previous studies, this case demonstrates that adherence to established management protocols significantly improves prognosis and reduces complications in patients with enterocutaneous fistula.

CONCLUSION

Enterocutaneous fistula remains a complex surgical condition associated with significant morbidity, primarily due to sepsis, electrolyte imbalance, and malnutrition. The present case highlights that early recognition and a structured, multidisciplinary approach are crucial for

successful management. Initial conservative treatment, including fluid resuscitation, correction of electrolyte disturbances, infection control, and adequate nutritional support, plays a vital role in stabilizing the patient and promoting fistula healing. In this case, adherence to these principles resulted in clinical improvement, reduction in fistula output, and optimization of nutritional status, which facilitated safe and effective definitive surgical intervention. The successful closure of the fistula without recurrence emphasizes the importance of timing surgery after adequate patient preparation rather than early operative intervention. Furthermore, the case reinforces that individualized management based on fistula characteristics and patient condition leads to better outcomes. With advances in supportive care and surgical techniques, the prognosis of enterocutaneous fistula has improved significantly. However, strict adherence to established management protocols and multidisciplinary coordination remains essential to reduce complications and improve survival.

Declaration by Authors

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