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CONSERVATIVE MANAGEMENT OF SMALL BOWEL ENTEROCUTANEOUS FISTULAS: POSSIBILITIES AND LIMITATIONS

Introduction

Enterocutaneous fistulas (ECF) represent a serious and potentially life-threatening complication characterized by an abnormal communication between the gastrointestinal tract and the skin. In over 85% of cases, ECF occur as a result of postoperative complications, while spontaneous occurrence is less common, mostly seen in patients with inflammatory bowel diseases, malignancies, infections, or following radiation therapy. Among enterocutaneous fistulas, a distinction is made between those originating from the small intestine and those from the large intestine (colocutaneous fistulas). This paper focuses exclusively on small bowel fistulas, which represent a specific clinical and therapeutic challenge due to their complexity and often prolonged and complicated course of treatment. Spontaneous closure of ECF is possible but relatively rare, depending on several factors including fistula output, presence of infection, patient nutritional status, and underlying disease. Understanding the mechanisms influencing spontaneous closure and the factors guiding treatment course is crucial for appropriate therapeutic decision-making and avoiding unnecessary invasive interventions. The aim of this paper is a narrative review of current literature, focusing on conservative therapeutic strategies, prognostic factors, and treatment outcomes of small bowel enterocutaneous fistulas.

Materials and Methods

This paper presents a narrative literature review focused on the conservative treatment of small bowel enterocutaneous fistulas. A systematic search was conducted in

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the PubMed, Scopus, Web of Science, and Cochrane Library databases, concentrating on articles published between 2010 and 2025. The search utilized English keywords and phrases: enterocutaneous fistula, conservative management, spontaneous closure, intestinal fistula. The search was limited to articles in English and Serbian.

Several dozen articles addressing various aspects of enterocutaneous fistulas were identified, including diagnostics, prognostic factors, conservative therapeutic approaches, and treatment outcomes. Most included studies involved patients with small bowel enterocutaneous fistulas, examined in the context of factors such as fistula output, infection, nutritional status, and presence of comorbidities. The total number of patients in relevant studies is estimated to be in the several thousands. Studies focusing on conservative treatment as the primary or initial treatment modality were included, with particular attention to factors influencing spontaneous fistula closure. Studies addressing large bowel fistulas (colocutaneous fistulas) or other etiologies outside the scope of this paper were excluded.

Screening and selection of articles were performed based on titles, abstracts, and full texts. The synthesized data were interpreted descriptively, emphasizing identification of key principles of conservative treatment, indications, and limitations.

Given the heterogeneity of studies and designs ranging from retrospective case series to meta-analyses, the aim of this review was to provide an overview of current knowledge and practical guidance for managing patients with small bowel enterocutaneous fistulas.

Discussion

Enterocutaneous fistulas (ECF) represent a serious complication of abdominal surgical procedures and constitute a pathological connection between the gastrointestinal tract and the skin. Their occurrence significantly complicates patient management, increases morbidity, and prolongs hospitalization (Härle et al., 2024) [1]. The postoperative cause is dominant, with about 85% of fistulas arising due to anastomotic dehiscence, infections, or necrosis of surrounding tissue, while the remaining 15% include spontaneously occurring fistulas often associated with inflammatory bowel diseases, malignancies, trauma, and radiation (Tang et al., 2023; Rao and Reddy, 2025) [2,3]. The rate of spontaneous fistula closure varies significantly in the literature, reflecting patient heterogeneity, different treatment protocols, and case selection. Average rates of spontaneous closure range between 15% and 30%; however, some studies have reported significantly higher percentages, from 50% up to 70–79% in selected populations with optimally managed conservative treatment (Vărcuş et al., 2022; Martinez et al., 2008; Zhou et al., 2024) [10,9,12]. These variations highlight the importance of precisely identifying patients with a higher potential for spontaneous closure, which is crucial for selecting the therapeutic approach.

Conservative treatment of ECF serves a dual purpose—attempting spontaneous fistula closure and simultaneously stabilizing the patient in preparation for possible surgical correction (Ali et al., 2022; Deipolyi and Oklu, 2014) [4,5]. Infection control is one of the most important factors for treatment success. The presence of sepsis, intra-abdominal abscesses, and peritonitis significantly reduces the chances of spontaneous closure and increases complication rates (Fischer and Bland, 2007; Liang et al., 2023) [6,7]. Selective antibiotic therapy and appropriate drainage are therefore essential, with continuous monitoring of clinical status and laboratory parameters enabling timely intervention. Besides infection, mechanical and local factors play a crucial role. Removal of foreign bodies, correction of ischemia in surrounding tissue, and reduction of pressure on the fistulous tract enable regeneration and healing. Skin protection around the fistula is of great importance, as irritation from intestinal contents leads to maceration, secondary infections, and complications that hinder treatment (Härle et al., 2024; Ali et al., 2022) [1,4].

In such cases, the skin around the fistula becomes red, moist, and painful, often prone to ulcerations. Proper local care is therefore essential. Careful cleaning and drying of the affected area are recommended, followed by application of protective barrier agents such as zinc oxide-based creams or pastes (e.g., zinc paste), which create a mechanical barrier and soothe irritation. In more severe cases, specialized dressings and barrier films can be used to further protect the skin and improve therapy tolerance.

The patient's nutritional status is perhaps the most important factor for successful conservative treatment. Chronic losses of fluids, proteins, and electrolytes through the fistula rapidly lead to malnutrition, which significantly slows the healing process (Lloyd et al., 2006; Vărcuş et al., 2022) [14,10]. A low serum albumin level (<25 g/L) is a strong independent risk factor for treatment failure and increased complication rates (Fischer and Bland, 2007) [6]. According to guidelines, enteral nutrition is preferred whenever possible as it supports intestinal mucosal integrity and immune response, while total parenteral nutrition (TPN) is used in high-output fistulas and patients with severe clinical conditions (Tang et al., 2023; Abubakar et al., 2010) [2,8]. Adequate nutritional status is a prerequisite for optimal treatment course and reduced mortality, as confirmed by meta-analyses (Cheng et al., 2023).

At the molecular level, factors such as VEGF and TGF-β play important roles in angiogenesis and tissue regeneration, but their effectiveness depends on the patient's overall condition and presence of comorbidities (Ali et al., 2022) [4]. Chronic inflammation, malignancies, and previous radiation are considered unfavorable factors for spontaneous closure (Rao and Reddy, 2025; Martinez et al., 2008) [3,9].

Among the key prognostic factors influencing the outcome of conservative ECF treatment, the following stand out:

1. Fistula output: Fistulas with output less than 200 mL/day have significantly higher chances of closure, while high-output fistulas often require surgical intervention (Fischer and Bland, 2007; Liang et al., 2023) [6,7].
2. Anatomical complexity: Simple fistulas with a single tract have better prognosis compared to complex, multitract fistulas (Härle et al., 2024) [1].
3. Nutritional status: Besides serum albumin, presence of sarcopenia and hypoproteinemia are associated with poor outcomes (Vărcuş et al., 2022) [10].
4. Infection and sepsis: Active infection and abscesses significantly reduce closure rates (Tang et al., 2023) [2].
5. Open abdomen: Has a negative impact on fistula closure with significantly lower success rates (Fischer and Bland, 2007) [6].

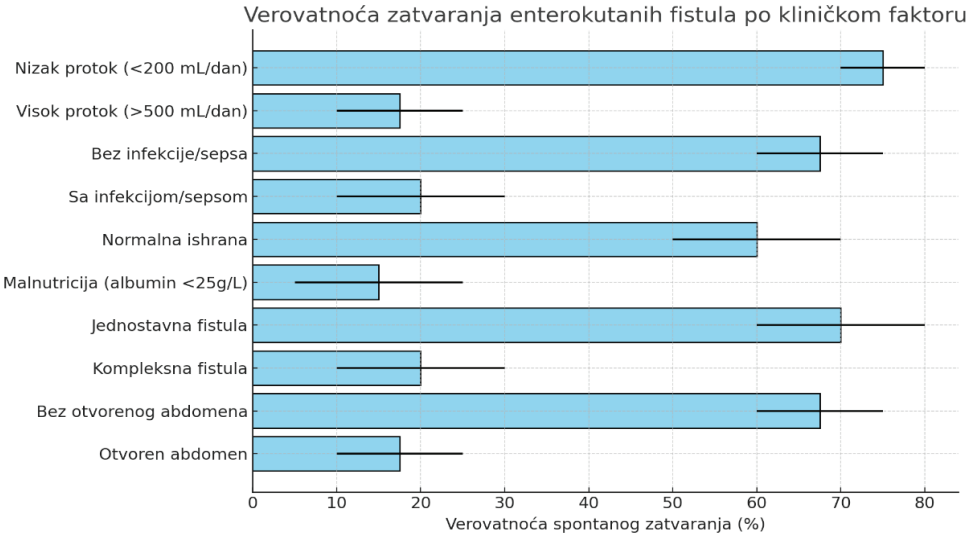

Chart 1. *Estimated probability range of spontaneous closure of enterocutaneous fistulas with conservative treatment, depending on key clinical factors. Values synthesized from data in multiple studies cited in the discussion.*

Pharmacologically, the use of somatostatin analogs such as octreotide shows beneficial effects in reducing fistula output, prolonging time to closure, and shortening hospital stay (Deipolyi and Oklu, 2014; Cheng et al., 2023) [5]. However, no significant improvement in mortality has been observed, indicating these drugs are useful adjuncts but not replacements for comprehensive therapy. Therapeutic methods such as negative pressure wound therapy (NPWT) and fibrin glue application show promising results in selected cases, especially in fistulas with favorable characteristics (Zhou et al., 2024) [12]. NPWT

helps maintain a dry and controlled local environment, promoting granulation and reducing the risk of secondary infections (Cheng et al., 2023) [5]. A significant challenge in conservative treatment is the prolonged process and need for continuous monitoring. The treatment course can last weeks to months, requiring hospitalization, nutritional regimen adjustments, fistula reassessment, and possible preparation for surgery if spontaneous closure is not achieved (Tang et al., 2023; Vărcuş et al., 2022) [2,10]. Surgical intervention is recommended after adequate nutritional and infectious stabilization to reduce the risk of recurrence and complications (Owen et al., 2013) [16].

Due to the complexity and heterogeneity of clinical conditions, a multidisciplinary approach involving surgeons, nutritionists, radiologists, and intensive care specialists is essential for successful management of patients with ECF.

Conclusion

Small bowel enterocutaneous fistulas represent a serious clinical challenge requiring an individualized and multidisciplinary approach. Although most patients ultimately require surgical treatment, conservative therapy plays an indispensable role both in attempting spontaneous closure and in preparing the patient for a safer and more successful operation. The outcome of conservative treatment largely depends on factors such as fistula output and complexity, presence of infection, nutritional status, and the patient's overall health condition. Properly implemented nutritional support, infection control, appropriate local care, and the use of adjunctive therapeutic methods (e.g., somatostatin, NPWT, fibrin glue) can significantly improve the chances of a successful outcome. Understanding the pathophysiology and identifying prognostic factors is crucial for timely decision-making regarding continuation of conservative management or referral for surgery. Further research and standardization of therapeutic protocols would contribute to improving treatment quality and reducing mortality in patients with ECF.

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