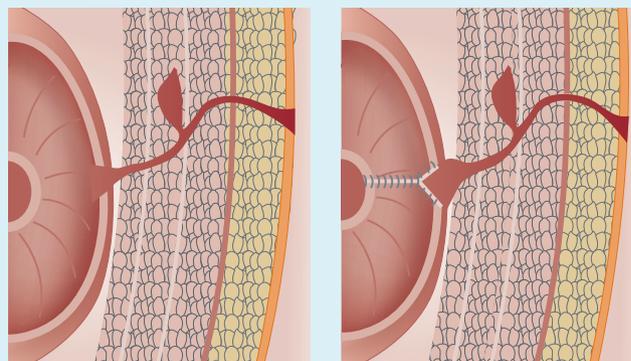


Mistakes in the management of enterocutaneous fistulae and how to avoid them

Philip Allan, Jonathan Epstein and Simon Lal

Gastrointestinal fistulae can be one of the most challenging complications of intestinal disease to manage. These abnormal tracts connect the epithelialised gut surface to either another part of the gut, another organ or tissue, or to the skin (table 1). This connection can cause enteric contents to bypass important absorptive surfaces, resulting in insidious malnutrition or overt diarrhoea, infection within other organs or the exquisitely embarrassing occurrence of having faeculent material in a woman’s vagina or on a person’s skin. Understandably, this can have a major impact on a person’s quality of life and psychological wellbeing and hamper overall prognosis in terms of general health and wellbeing. Through careful multidisciplinary management of the situation much can be done to address the fears and expectations of patients: careful stoma management, medical therapies to control output, nutritional support and consideration of the central role that surgery plays in resolving a fistula.



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Enterocutaneous and enteroatmospheric fistulae both connect the gut to the skin, but the difference between them is whether there is skin around the fistula opening (enterocutaneous) or the fistula opens onto a laparostomy wound (enteroatmospheric). Most enterocutaneous fistulae develop following surgical intervention; however, fistulae can occur spontaneously. Spontaneous fistulae typically arise with mucosal inflammation such as that occurring with Crohn’s disease, but they can also appear in patients with neoplasia, following radiation treatment, or in the presence of foreign bodies or infections (e.g. tuberculosis or actinomycosis).

Here, we focus on the errors that can be made when managing enterocutaneous fistulae, based on our clinical experience and the available evidence.

Mistake 1 Not having an multidisciplinary team approach

The management of intestinal fistulae is best carried out by taking a multidisciplinary team (MDT) approach.¹ An MDT approach ensures that the patient is managed holistically and has access to doctors from various specialties (including gastroenterologists and intestinal failure physicians, surgeons, radiologists, intensivists, biochemists and psychiatrists), experienced nurses, pharmacists, dieticians, stoma therapists, psychologists, occupational

therapists and physiotherapists. Involving an MDT can generate conversations, views and strategies that facilitate optimum patient care. Indeed, engaging expertise from different disciplines helps to prevent blind spots in treatment plans and facilitates timely decision making, whilst ensuring that patients are aware that there is a structured course of action. Each patient will not necessarily require all of the professionals mentioned above to be involved in their care, but it is an important strategic aim of any service seeking to care

for these patients to have ready access to such professionals. Where some of these professionals are not available, it requires roles within the team to be extended to compensate for the deficiency. This situation may mean that a patient misses out on key knowledge and education, attitude and empathy or timely decisions that could have a profound impact on morbidity and mortality.

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Site of origin	Site of termination	Examples
Gut • Small intestine • Stomach	Gut • Small intestine • Colon	Entero-entero Gastrocolic
Gut • Bile duct • Colon	Another organ/tissue • Colon • Bladder	Choledochalcolic Colovesical
Gut • Gut • Gut	Skin • Skin around fistula • Laparostomy wound	Enterocutaneous Enteroatmospheric

Table 1 | Naming of gastrointestinal fistulae. Fistulae are named according to their site of origin (the beginning of the name) and site of termination (the latter part of the name).

Mistake 2 Failing to adopt a systematic approach to management

A careful, methodical, systematic approach to management is what keeps a patient's care pathway moving forward. Being systematic also prevents high-risk strategies (i.e. trying out the latest 'flavour of the month') from being pursued and ensures that the entire MDT has a safe, cohesive and structured approach. The optimal strategy for managing gastrointestinal fistulae that has stood the test of time is the 'Sepsis-Nutrition-Anatomy-Plan' or 'SNAP' approach (figure 1).¹

Sepsis in patients with gastrointestinal fistulae is multifactorial in origin and may be low grade and indolent but can easily become life-threatening if not managed correctly. Typical sources of sepsis in this setting include central venous catheters (in patients

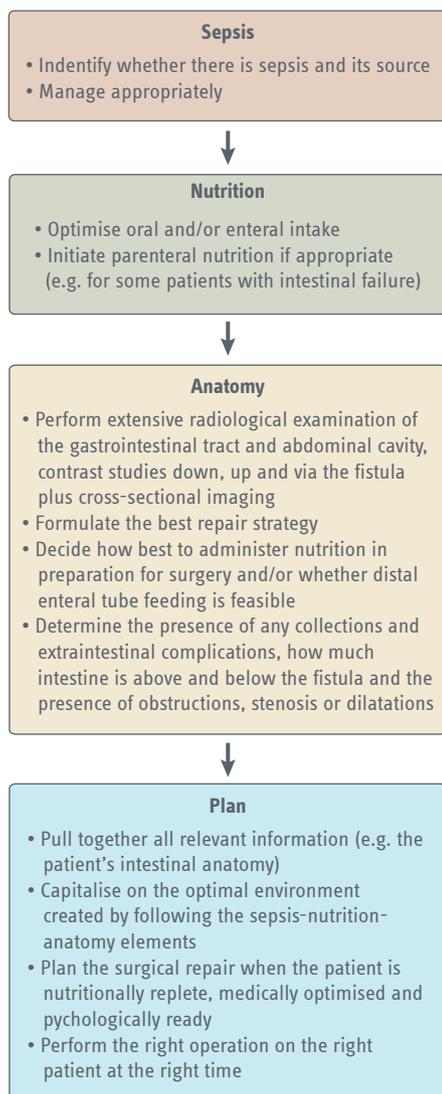


Figure 1 | The 'Sepsis-Nutrition-Anatomy-Plan' or 'SNAP' approach to managing gastrointestinal fistulae.

receiving parenteral nutrition), intra-abdominal collections and respiratory or urinary infections. Identifying and managing sepsis is a crucial first step in the management of intestinal fistulae, to preserve life and to facilitate the switch from a catabolic to an anabolic state, so allowing recovery with nutritional support.

Nutritional support should be via the oral and/or enteral route whenever possible; however, if the patient has intestinal failure, parenteral nutrition may be required. Intestinal failure can occur in patients who have a proximal, 'high output' enterocutaneous or enteroatmospheric fistula, such that gastrointestinal absorption of nutrients is not sufficient to achieve optimal nutritional status. Maximising oral and/or enteral nutrition protects the integrity of the gut, provides psychological benefit to the patient and protects the liver from excessive parenteral feeding. Optimising oral and/or enteral intake, in combination with dietary and medical therapy, will aid control of the enteric output, facilitating the provision of effective nutrition. This effective nutrition and reduced output helps improve nutritional status and allow the preparation of the body for the healing process that will occur following surgery

Understanding an individual patient's anatomy is essential for a successful outcome. So, once a patient is stable, extensive radiological examination of the gastrointestinal tract and abdominal cavity should, therefore, be undertaken. Such evaluation helps the surgeon decide the best strategy for the fistula repair prior to embarking on the operation and helps to determine how the patient may best receive nutrition in preparation for surgery and/or whether distal enteral tube feeding is feasible. Extensive contrast studies down, up and via the fistula plus cross-sectional imaging are required to determine the presence of any collections and extra-intestinal complications that may impact the success of surgery. The contrast studies provide information on quantity (i.e. how much intestine is above and below the fistula) and quality (e.g. the presence of obstructions, stenosis or dilatations).

The final management plan requires the correct information (e.g. the patient's intestinal anatomy) to make use of the optimum environment created by the sepsis-nutrition-anatomy elements of the SNAP approach. For example, surgical repair can occur when the patient is nutritionally replete, medically optimised and psychologically ready. This approach helps ensure that the right operation is performed on the right patient at the right time, and that it is performed only once.

Mistake 3 Not considering all the factors that make spontaneous fistula closure less likely

In some cases, a fistula may spontaneously heal without having to resort to surgery and it is important to manage patient expectations regarding the possibility of spontaneous fistula closure. In those patients who are nutritionally well with optimal medical therapy, it is our experience that of those fistula that could close spontaneously more than 90% will have done so by 6 weeks. So, if at 6 weeks the fistula has not closed, it is highly unlikely to close and will therefore require surgical intervention. There are several factors that make spontaneous fistula closure less likely, including: spontaneous development of a fistula; a fistula that developed more than 6 weeks ago; a high-output fistula; intercurrent sepsis; and the presence of a distal intestinal obstruction. Whilst these are the most common and important factors, it is clear that other comorbidities, the presence of steroids or an ageing population may prevent spontaneous healing. It is also important to examine the patient's abdomen—if intestinal mucosa can be seen on the surface of the abdomen then the fistula is less likely to close.

Mistake 4 Prolonging nil by mouth

There is rarely any benefit in prolonging the recommendation for nil by mouth beyond 4–6 weeks simply in the hope that this will help the fistula close spontaneously. The role of preventing oral intake should be to determine the natural baseline volume of effluent produced via the fistula (e.g. for a 48-hour period while the patient is receiving parenteral support), which can then be used to help determine the impact of reintroducing food and drink. In the presence of a fistula that's feeding an intra-abdominal cavity and/or collection, reducing enteric contents containing food can also help control infection. There is a risk of psychological harm from prolonged lack of eating so the reason to recommend a nil-by-mouth approach should be carefully discussed with the patient, with an outline of the expected timeframe given.

Mistake 5 Assessing and managing fluid balance incorrectly

A series of questions already exists for the assessment of patients with short bowel syndrome and the principles of dietary intake and fluid management applied to these patients should also be applied to patients with enterocutaneous fistulae. In the absence of control and due to the loss of absorptive

capacity within the gut, the natural societal urge to drink more when thirsty will actually dehydrate further and deplete the patient of key electrolytes, such as sodium, potassium and magnesium. Water absorption should, therefore, be optimised by ensuring patients are consuming oral glucose saline solutions that have a sodium concentration >90 mmol (e.g. double-strength diolyte). To minimise enteric secretions (thus water loss), slow gut transit time and maximise absorption, medications, including proton pump inhibitors (PPI), loperamide and codeine (used with caution in elderly patients), should also be optimised.

Mistake 6 Failing to check the fistula effluent pH

Enterocutaneous/atmospheric effluent can burn the skin and cause leakage from stoma appliances, worsening the integrity of the skin. Checking the pH of the fistula effluent can ensure that effective dosing of PPIs occurs, reducing acid injury to the skin, and may have the added benefit of reducing the effluent output as well.

Mistake 7 Prolonged use of octreotide

Octreotide is a somatostatin analogue that reduces pancreatic secretions and has been proposed to be used in the management of gastrointestinal fistulae because it reduces gastrointestinal secretions. A meta-analysis of nine randomised controlled trials comparing octreotide with placebo for the management of enterocutaneous fistulae found in favour of using octreotide, with an increased closure rate and shorter closure time.² However, there was heterogeneity in the trial designs and/or outcomes measured and frequently only a small number of patients were included. Several of the studies evaluated also included pancreatic or biliary fistulae, which are more likely to respond to octreotide therapy than enterocutaneous fistulae. Furthermore, it is painful for patients to have the required three subcutaneous injections of octreotide per day and longer acting somatostatin analogues are more expensive. If trialled in individual patients, then the likely efficacy of these medications needs to be measured against the factors that make spontaneous fistula closure less likely (see mistake 3) and for a maximum of 72 hours.

Mistake 8 Not considering distal enteral tube feeding (fistuloclysis)

Prior to reconstructive surgery, consideration should be given to distal enteral tube feeding

(fistuloclysis) for at least 2 weeks, but optimally for 6 weeks. Enteral tube feeding down the most distal limb of an enterocutaneous fistula promotes rejuvenation of the gut mucosal surface so that it can start absorbing nutrients. In addition, distal feeding can reverse any atrophy of the gut segment, facilitating surgical reanastomosis and potentially reducing the risk of an anastomotic leak or refistulation.

Mistake 9 Over-reliance on biological agents in patients with Crohn's disease

Many intestinal fistulae that occur in patients who have Crohn's disease are the result of a surgical complication, rather than being caused by the Crohn's disease itself. The efficacy of anti-TNF agents for closing enterocutaneous fistula is limited—long-term closure occurs in less than one-fifth of cases and an intra-abdominal abscess forms in nearly one-third of those treated with anti-TNF agents.³ In addition (as per mistake 3), it is important to recognise the factors that make fistula closure less likely when deciding whether or not to commence biological agents to manage an enterocutaneous fistula.

Mistake 10 Performing surgery too early

The optimum timing of surgery is vital to ensure that each patient undergoes as few further procedures as possible (as outlined in mistake 2). In particular, if the fistula is an iatrogenic complication, there can be a

desire to reoperate and resolve the problem as soon as possible; however, operating before sepsis is drained, nutrition optimised and the anatomy clearly defined exposes the patient to an increased risk of an unsuccessful outcome. Experience also suggests that post-surgical intraperitoneal adhesions soften with time, facilitating reoperation during what is likely to be a complex procedure. Finally, even after a patient is stabilised, a period of waiting, often with a patient at home on home parenteral nutrition, can improve the chances of a successful and definitive reconstruction. The optimum advocated time in the literature varies, with some recommending as early as 6 weeks⁴ whereas most recommendations are for at least 6 months.^{5,6}

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Your gastrointestinal fistula briefing

UEG Week

- 'Perianal fistulising Crohn's disease: From pathophysiology to management' session at 25th UEG Week 2017 [<https://www.ueg.eu/education/session-files/?session=1877&conference=149>].
- 'Assessment and management of anal fistula' presentation in the 'Protocol for the practical gastroenterologist' session at UEG Week 2016 [<https://www.ueg.eu/education/document/assessment-and-management-of-anal-fistula/128895/>].
- 'Fistulae after bariatric surgery' presentation in the 'Endoscopic treatment of complications after upper GI surgery' session at UEG Week 2016 [<https://www.ueg.eu/education/document/fistulae-after-bariatric-surgery/131360/>].

Society conferences

- 'Postoperative fistula: How to prevent?' presentation in the 'Pancreas surgery' session at the 11th EDS

Postgraduate Course, Budapest 2017 [<https://www.ueg.eu/education/conference-files/?conference=146>].

Standards and Guidelines

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