

Spontaneous Closure of Enterocutaneous Fistulas: Total Parenteral Nutrition Compared to Enteral Nutrition, A Review of the Evidence

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Abstract

An enterocutaneous fistula (ECF) is an abnormal connection between the intra-abdominal gastrointestinal tract and the skin. Chief complications include electrolyte/fluid abnormalities, sepsis, and malnutrition with the latter two resulting in the majority of identified mortality. Nutritional support is therefore a key aspect of ECF management, and debate persists on the optimal route to administer this nutritional support. A search was conducted of prominent online databases from June 1, 2015 through June 30, 2015, for published systematic reviews/meta-analysis, cohort studies, and clinical research trials that evaluated the effectiveness of total parenteral nutrition (TPN) and enteral nutrition (EN) on spontaneous closure of enterocutaneous fistulas. Review of these articles demonstrated TPN and bowel rest do not directly facilitate spontaneous fistula closure. Given the inherent complications of TPN and the benefits of EN, EN should be utilized as early as possible in the nutritional management of ECF patients. TPN should be spared for when EN is contraindicated or as a bridge until EN can be tolerated by the patient. More studies are needed to directly compare rates of spontaneous ECF closure with TPN vs. EN

Introduction

An enterocutaneous fistula (ECF) is an abnormal connection between the intra-abdominal gastrointestinal tract and the skin. Most ECFs (75 - 85%) are post-operative in nature with iatrogenic injury, surgical intervention for inflammatory bowel disease, malignancy and trauma with subsequent anastomotic leak being most common.^{1,2} Many complications arise from the development of ECF, but the classical triad of complications is electrolyte/fluid abnormalities, sepsis, and malnutrition.² Despite the relative rarity of ECFs, the associated mortality rate is considerable at 5% - 41%, with the most common cause of death being sepsis and associated malnutrition.^{1,3}

Significant fluid, electrolyte and protein losses can arise as the fistula effluent is lost when it should be retained and absorbed. These losses, coupled with the sepsis-induced catabolic state, can significantly affect mortality. As it stands, nutritional support is a key aspect of ECF management and debate still persists on the optimal route to administer this nutritional support.³ Since the 1970s, total parenteral nutrition (TPN) and the concept of 'bowel rest' have become widely adopted in the management of ECFs.² Administration of TPN and NPO status are thought to facilitate fistula closure as this bowel rest has been shown to decrease gastrointestinal secretions up to 50%, allowing for decreased fistula output and subsequent spontaneous closure. Although widely accepted, there is a paucity of data to suggest TPN and bowel rest improve the spontaneous closure of ECFs.³

Complications inherent to TPN administration include central venous catheter infection, cirrhosis, hepatic failure, refeeding syndrome, electrolyte derangements and Wernicke encephalopathy.⁴ Benefits of enteral nutrition (EN) are well documented in critical care literature and include preservation of enteric mucosal integrity, enhancement of immunologic and hormonal function of the gastrointestinal tract as well as improved hepatic protein synthesis.¹ The ultimate goal of fistula management is closure of the fistula with as minimal morbidity and mortality as possible. Given the inherent complications of TPN administration, benefits of EN, and the significant role nutritional status plays in overall mortality if ECF management, the route of nutritional support and its effect on spontaneous closure of ECFs is important to investigate.

Methods

Articles were identified by searching prominent online databases from June 1, 2015 through June 30, 2015, for published systematic reviews/meta-analysis, cohort studies, and clinical research trials that evaluated the effectiveness of total parenteral nutrition and enteral nutrition on spontaneous closure of enterocutaneous fistulas. Search terms included enterocutaneous fistula, total parenteral nutrition, enteral feeding, and nil per os (NPO) with exclusion of articles including patients under 18 years of age.

Results:

A 2010 systematic review by Sepehripour and Papagrigoriadis evaluated the use of TPN in the management of ECF and the efficacy of this route of nutritional support in spontaneous ECF closure. The etiology, anatomic location and output volume varied significantly between the reviewed studies. Comparison and proper interpretation of the data put forth was difficult, with no direct comparison between TPN and EN regarding outcomes mortality or complications being noted.⁵ The ongoing debate regarding the superiority of TPN to EN was referenced, and support for this claim in the published literature was found to be notably inconclusive. Total parenteral nutrition was not shown to improve overall mortality and had little, if any, effect on spontaneous closure of ECFs.⁵ The concept of bowel rest was found to be widely accepted, but largely unproven as RCTs with NPO data arms have yet to be performed.^{3,5} The current stance on the preferred route of nutritional support in ECFs should be EN unless a clear contraindication is present or EN is not tolerated by the patient. Even then, TPN should only be utilized until EN is tolerated.⁵

A systematic review conducted in 2006 by Lloyd, et al. evaluated the initial nutritional support of ECFs. No data was found to support the claim TPN increases the rate of spontaneous ECF closure.³ The concept of bowel rest was also found to be largely unproven, although benefit was noted in achieving early control of fistula output, using TPN in conjunction as a bridge until fistula output was controlled and sepsis was resolved. Once sepsis had been controlled and electrolyte derangements had been resolved, EN was strongly advocated as one reviewed study demonstrated 85% of patients with ECF were nutritionally maintained on EN with 40% spontaneous ECF closure rate and 19% mortality.⁶ Although no clear consensus was found regarding the superiority of TPN to EN, they advocate for the surgical adage of "if the gut works, use it."⁴

Discussion

Enterocutaneous fistulas can be a devastating post-operative and post-traumatic complication. Nutritional support is critical to the overall survival of these patients and can prove challenging. The

goal of fistula management is to obtain closure of the fistula with minimal mortality and morbidity. TPN and bowel rest have not been proven to directly facilitate spontaneous fistula closure. Given the inherent complications of TPN and the benefits of EN, EN should be utilized as early as possible in the nutritional management of ECF patients, sparing TPN for when EN is contraindicated or as a bridge until EN can be tolerated by the patient. More studies are needed to directly compare rates of spontaneous ECF closure with TPN vs. EN.

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