

Postponed Reconstructive Surgery for Entero-Cutaneous Fistulas

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Abstract

The enterocutaneous fistulas (ECFs) are the most feared and devastating complication in abdominal surgery. ECF management has changed over time and the step-by-step approach including postponed reconstructive surgery is currently a common practice in specialized centers. Sepsis resolution, adherence Softness, achieving the best patient physical condition is required before definitive fistula surgery to optimize postoperative outcomes. The author reported by most specialized centers, therefore postponing reconstructive surgery for enteric fistula is highly recommended and longer interval time to definitive surgery was associated with lower rates of fistula recurrence. According to the with large variation time of fistula surgery in published data, the optimal time to reconstructive surgery could not be defined precisely.

Keywords: Enterocutaneous fistula; Postponed surgery; Timing of reconstructive surgery; Fistula recurrence

Introduction

An enterocutaneous fistula (ECF) is an abnormal communication between the intrabdominal gastrointestinal tract and the skin and is mostly the feared and devastating postoperative complication in abdominal surgery. The incidence of ECF is rare and approximately 75-85% of ECF occurs following abdominal surgery [1] and the incidence has been increasing in relation with higher incidence of damage control surgery performed for major trauma [2]. ECFs resulted from underlying diseases such as Crohn's disease, radiation enteritis or diverticular disease were only in 15-25% of cases [3,4]. Enteroatmospheric fistulas (EAF) is a special subset of ECF, characterized by the presence of visible intestinal mucosa and the absence of overlying soft-tissue within an open abdomen, despite its very lower incidence, EAF is associated with high risk of intestinal injuries and challenging and complex surgical procedures to achieve abdominal wall reconstruction. The ECFs were classified according to daily output as low-output ECF with less than 200 mL of effluent per day, moderate from 200-500 mL per day, and high output upper to 500 mL per day. Massive losses of fluid and electrolyte and the so reduced nutrient resorption are major consequences of ECF. Intestinal failure (IF) is the most important homeostatic and metabolic problem encountered with ECFs [5]. So parenteral nutrition (PN) is required to fulfill nutritional demands and correct fluid and electrolyte imbalance in these patients. The management and timing of enterocutaneous fistula surgery (ECF) have been changed over the last decades. Postponed reconstructive surgery for ECF allows the possibility to spontaneous closure. However spontaneous healing or closure of enteroatmospheric fistula (EAF) and high output ECF is rarely obtained and surgery is often required.

Reconstructive surgery for ECF

The concept of postponed reconstructive surgery was defined as single staged elective surgery to takedown an intestinal fistula (ECF/EAF) for a period until the sepsis was eliminated and the patient had achieved the best physical condition.

Optimal timing

The management and timing of enterocutaneous fistula surgery (ECF) have been changed over the last decades. Postponed reconstructive surgery for ECF allows the possibility to spontaneous closure. However, spontaneous healing or closure of enteroatmospheric fistula (EAF) and high output ECF is rarely obtained and surgery is often needed.

Historically, delaying reconstructive surgery for ECF has been reported firstly in 1970 and then until 1983, a step-by-step approach of ECF management involving postponed reconstructive surgery of ECF was described [6,7]. Delaying surgery until complete resolution of sepsis and achievement of an acceptable patient nutritional condition was recommended and unfortunately the first reports on management of ECF according to this strategy was published 20 years later.

So postponing surgery for ECF is giving an opportunity for fistula spontaneous closure, allowing ample time to improve nutritional patient conditions, to obtain fistula maturation and complete resolution of abdominal inflammation, and softening adhesions and thus enabling a safe adhesiolysis. Delaying ECF surgery also allows time to scar tissue formation on an open abdomen in case of EAF to decrease operative intestinal injury.

Low-output fistula is more likely to heal spontaneously within 3-6 months; however, surgery often required in high output and EAF fistulas. According to the published reports, optimal timing for ECF surgery is not determined and still debated until today. Nowadays, delaying reconstructive surgery for ECF is common practice devoted to specialized centers and the most published reports were provided from these referral centers [8-19]. However the large variation between these published studies in term of median time to fistula reconstructive surgery and postoperative follow-up and the presence of a selection bias in some studies as referring patients to specialized center for recurrence after several surgical attempts, make difficult determine an optimal timing for ECF reconstructive surgery. However, longer time interval to surgery is associated with lower rate recurrence [8-20].

The timing of definitive surgery of ECF should be individualized according to patient characteristics because resolving abdominal sepsis, improving nutritional condition, restoring homeostasis, providing

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adequate wound care and physiotherapy take a long time. Therefore, probably, a time interval of 6-12 months after the last laparotomy is the optimal timing for ECF surgery to achieve a good outcome with lower rates of recurrence and associated mortality and morbidity.

Surgical technique

Surgical technique is an interest risk factor as that it can be amended. Compared to over sewing or wedge repair, complete resection of affected intestinal segment was associated with lower recurrence rates (11-17 vs. 22-36%) [8,17].

Anastomotic technique is still debated in the absence of published studies comparing stapled and hand-sewn anastomosis reconstruction for ECF surgery. However stapled anastomosis was associated with less favorable outcome and it was found to be a significant risk factor for fistula recurrence and one-year mortality [17,21]. The exact mechanism is unknown; however, the extensive adhesiolysis in such patient's results in thickness and edema of the intestinal wall making possibly stapled anastomoses less safe. Based on lack of published studies on anastomotic technique following ECF surgery, i personally omit to perform stapled anastomosis in these types of abdomen and most of the experienced gastrointestinal surgeons believe that hand-sewn anastomoses are superior to stapled anastomosis in fistula surgery.

The abdominal wall reconstruction (AWR) is a complex and high-risk procedure in most cases of EAF when performing definitive fistula surgery. The enteroatmospheric fistulas (EAF), which is a special subset of ECF, are mostly associated with abdominal wall defects that should be evaluated and considered before fistula surgery. The exposure of bowel to the environment is likely a leading risk factor to fistula formation (EAF), so abdomen closure over repaired bowel must be obtained in all costs. Although there is no ideal technique or simple approach to abdominal wall reconstruction (AWR), however the approach is dictated in part by the decision to stage or not the abdominal wall repair and anatomical conditions.

A hernia recurrence rate of 31% was reported in literature after simultaneous wall repair using different methods including component separation techniques (CST), suture repair alone or with prosthetic mesh and prosthetic mesh alone in patients with large abdominal wall defects [19-26]. Therefore delaying AWR should be considered in the presence of risk factors or surgical difficulties related to very large abdominal wall defects.

Outcome

ECF closure and recurrence: The reported fistula closure rate including spontaneous healing or following fistula surgery varied from 80 to 97% [8-13,16-19,23,27]. However, fistula closure was achieved in some cases after several surgeries. Despite the large variation between reported studies in determining recurrence time of ECF during the follow up period, the recurrence rates following reconstructive surgery varied from 5 to 38% [8-19,21,23].

Although the most majority of published studies were retrospective with considerable heterogeneity making comparison so difficult, longer time interval to surgery was found to be associated with lower recurrence rates [8-19].

Mortality: The 30-day mortality or in-hospital mortality rates following ECF surgery varied from 0 to 7% [15,16] and highest mortality rate was reported by studies with shortest median time to ECF surgery [21]. Compared to previously reported mortality (10-20%) after acute and postponed surgery [28-31], the mortality rates were improved and several factors contributed to improvement of mortality rates including advances in wound care, better intensive care facilities, and radiological drainage and postponed reconstructive surgery.

Morbidity: The reported morbidity varied widely between studies and this variation is due to a variety of classification systems used to report complications data. Although the most reports were from specialized centers, the overall morbidity rates were and varied from 72 to 88% [8,11,13,17,21,22,]. Some studies reported a rate of 36% of postoperative complication scored as Grade III or IV of Clavien-Dindo classification [12] and a rate of 21-65% of surgical site infections (SSIs) as described by Center for Disease Control and Prevention [8,9,21-23]. The reported rate of additional reoperation or radiological drainage was ranged from 3% to 19% [9,15,19,22,32-37].

Conclusion

EC fistula management aims to restore gastrointestinal (GI) continuity and thus allowing enteral nutrition with acceptable morbidity and mortality. A step-by-step approach is recommended to achieve a good outcome. Therefore, eliminating sepsis, reducing and controlling fistula output, providing an intensive wound care, homeostasis and achieving an adequate nutrition are the cornerstones of treatment during bridging-to-surgery period. This step-by-step approach was recently recommended and currently is adopted as a standard practice in specialized centers [5]. On the basis of published reports, determining optimal timing to reconstructive surgery for ECF remains difficult because the most majority of published studies on management of ECF were retrospective and performed in specialized centers with remarkable heterogeneity. Therefore prospective studies with standardized data collection across specialized centers is more likely required to make a precise recommendations about optimal timing of definitive enterocutaneous fistulas surgery (ECF/EAF). However, probably, a time interval of 6-12 months after the last laparotomy is the optimal timing for ECF surgery to achieve a good outcome with lower rates of recurrence and acceptable associated mortality and morbidity.

Conflict of interest

The authors declare no conflict of interest.

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