Gastrointestinal Fistulae

An essay

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List of Abbreviations

AEF	:	Aortoenteric fistula.
BUN	:	Blood urea nitrogen.
CBC	:	Complete blood culture.
CT	:	Computed Tomography.
CTE	:	Computed Tomography enterography.
ECF	:	Enterocutaneous fistulas.
ENS	:	Electrical nerve stimulation.
GI	:	Gastrointestinal.
IBD	:	Inflammatory bowel disease.
IgA	:	Immunoglobulin A.
IV	:	Intravenous.
MOFS	:	Multiple organs failure syndrome.
MRE	:	Magnetic Resonance enterography.
MRI	:	Magnetic Resonance Imaging.
OTSC	:	Over the Scope Clip.
SBE	:	Small bowel enterography.
SBFT	:	Small bowel follow through.
SMOF	:	Soya Oil, Medium-chain Triglycerides, Olive Oil and Fish Oil.
TNF	:	Tumour necrosis factor.
TPN	:	Total parenteral nutrition.
US	:	Ultrasound.
UTI	:	Urinary tract infection.
VAC	:	Vacuum-Assisted Closure.
WBCs	:	White blood cells.

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Introduction

Fistula is derived from the Latin word that means "pipe." A fistula is an abnormal connection between two epithelialized surfaces. It usually involves the gut and another hollow organ, such as the bladder, urethra, vagina, or other regions of the GI tract. Fistulae may also form between the gut and the skin or between the gut and an abscess cavity. Rarely, fistulae arise between a vessel and the gut, resulting in profound GI bleeding, which is a surgical emergency. ***(Stein et al., 2011).***

In surgical textbooks, gastrointestinal fistulae are described as surgical tragedies, catastrophes or disasters. Most gastrointestinal fistula occur following abdominal surgeries and only 15-25% of spontaneous gastrointestinal fistula are the result of underlying diseases such as Crohn's disease, radiation enteritis or diverticular disease. The incidence of traumatic intestinal fistula has been increasing due to the higher incidence of damage control surgery performed for major trauma. ***(Fischer et al., 2009)***.

Features suggestive of an gastrointestinal fistula include postoperative abdominal pain, tenderness, distention, enteric contents from the drain site, and the main abdominal wound. Tachycardia and pyrexia may also be present, as may signs of localized or diffuse peritonitis, including guarding, rigidity, and rebound tenderness. ***(Kate et al.,2014)***.

Gastrointestinal fistulae are associated with significant morbidity and mortality. Patients with intestinal fistula are faced with the burden of overcoming septic complications

resulting from early intra-abdominal infection, fluid electrolyte imbalance and malnutrition. ***(Lee, 2012).***

The degree of sepsis depends on the state of the fistula . If the fistula forms a direct tract through which the bowel contents are draining onto the skin, then the sepsis may be minimal, whereas if the fistula forms an indirect tract through which the bowel contents are draining into an abscess cavity and then onto the skin, the degree of sepsis may be higher. In the presence of extensive peritoneal contamination or generalized peritonitis with fistula, the patient can be toxic due to severe sepsis. ***(Campos et al.,2010)***.

The goal of diagnostic efforts is the precise anatomic classification of the fistula. In an external fistula the discharge should be accurately measured and analyzed for amylase and bacteriology. The patient's general condition, haemoglobin and WBC, electrolytes including acid-base balance, and nutritional status including albumin and where possible transferrin; all should be assessed. ***(Gonzalez et al.,2001)***.

Computed Tomography (CT) scan with contrast is the gold standard diagnostic modality. Intravenous (IV) contrast demonstrates inflammation whereas oral contrast differentiates loops of bowel from extraluminal collection or abscesses. Abscesses may be identified by air-fluid levels, air bubbles, or contrast extravasation. CT also provides the advantage of a modality that allows guidance of percutaneous drainage.
(*Hollington et al., 2004)*.

Historically, fistulograms or sinograms have been the first choice in the evaluation of gastrointestinal fistulae.

Fistulograms are the most rapid and direct method of linking a cutaneous opening with the gastrointestinal (GI) tract. In the absence of sepsis, fistulograms may be the only imaging study needed. ***(Osborn and Fischer, 2009).***

Further diagnostic work-up includes upper and lower GI endoscopy, upper and lower intestine radiography with water soluble contrast medium and ultrasound. ***(Lawrimore et al., 2004).***

Proper preoperative patient preparation and meticulous surgical technique will lessen the risk of postoperative fistula formation. In the elective setting, operation may be delayed to allow for normalization of nutritional parameters, thus optimizing wound healing and immune function. Several nutritional characteristics have been suggested to increase the risk of anastomotic breakdown : Weight loss of 10–15% of total body weight over 3–4 months, Serum albumin less than 3 mg/dL, Serum transferrin less than 220 mg/dL or Inability to perform activities of daily living due to weakness or fatigue. Delay of elective procedures to allow for nutritional support to address these abnormalities may decrease the risk of anastomotic dehiscence and formation of postoperative fistulae. ***(Evenson et al., 2007)***.

The management of gastrointestinal fistulae, particularly enterocutaneous ones, require an integrated multi-disciplinary approach aimed at fluid resuscitation, controlling sepsis, controlling and reducing fistula output, protecting skin and wound care, providing nutritional support followed by the planning and institution of definitive surgical repair, when necessary. Various protocols have been developed based on

the time course of the different treatment phases. ***(Evenson et al., 2007)***.

This multidisciplinary approach requires a team of specialized individuals including the surgeon, gastroenterology specialists, an interventional radiologist, therapist, as well as a dedicated ancillary unit of specialized nurses, a dietician and pharmacist. Intestinal fistulae are a surgical disease first and foremost; the surgeon should direct all aspects of the patient's management. ***(Heller et al., 2006)***.

Favorable outcome in patients with gastrointestinal fistulae depends on control of sepsis, adequate nutritional support, maintenance of fluid-electrolyte balance, and skin protection. ***(Kumar et al., 2011)***.

Conservative management is successful in 65% of cases. Moreover, when surgical and conservative treatments are compared for recurrence, success rate and mortality there is no statistically significant differences between the two. However, conservative management is more successful in patients with low output fistulae. Fewer patients with low out put fistulae needed any surgery, when compared to patients with high output fistulae. This is in keeping with the general opinion regarding high output fistulae, which are more difficult to manage. ***(Taggarshe et al., 2010)***.

The duration of conservative management should be based on the anatomic studies of the fistula tract. In the absence of the adverse prognostic factors (FRIEND) Foreign body, Radiation, Inflammation, Infection, Inflammatory bowel disease, Epithelization of the fistula tract, Neoplasms and

Distal obstructions, the reported success rate of fistula closure varies from 30% to 74% in patients within a time frame of 4 to 12 weeks. Determining the optimal time for surgical intervention has not been well defined in the literature. However, surgery should be delayed until the intra-abdominal and systemic conditions of the patient are conducive to major surgery. ***(Lee, 2012).***

Delayed surgery is most commonly indicated in patients whose fistulas have not healed after several weeks (typically 4-8 wk) of comprehensive conservative treatment. Specific indications include the following: Continued high output from fistula after patient has been given nothing by mouth and started on parenteral nutrition ,Continued signs of infection after institution of adequate antibiotic therapy and drainage of associated abscesses or Uncontrolled bleeding. ***(Pal et al., 2013)***.

The operation should be performed through an adequately healed abdominal wall in which a secure abdominal closure can be obtained. Meticulous dissection and lysis of adhesions are performed to ensure that more distal obstruction of bowel is not present. Care is taken not to cause an unnecessary enterotomy, which, if it occurs, must be repaired with care. If technically possible, the entire gastrointestinal tract is carefully examined. Pre-operative imaging studies will have indicated the site of the fistula**.** ***(Memon and Siddiqui, 2004).***

There are a number of surgical options: resection and anastomosis, which is the preferred option whenever feasible (the anastomosis is performed using healthy bowel in a clean

field distant from the site of sepsis); resection with exteriorisation of bowel ends if there are factors adverse to optimal anastomotic healing; and wedge excision of the fistulising segment of bowel and primary repair if the fistula is small**. *(Memon and Siddiqui, 2004)*.**

Aim of the Work

The aim of this study is to review the state of the art evidence based management of gastrointestinal fistulae, which constitute a major catastrophe to the patients and surgeons, and it still has a high incidence of morbidity and mortality, and their management remain a big challenge.