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Original Research Article

Management and outcome of patients with gastrointestinal cutaneous fistula in Al-Karama teaching hospital

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ABSTRACT

Background: Gastrointestinal cutaneous fistulae are abnormal communication between stomach, small or large bowel, and the skin allowing the gastrointestinal contents to flow onto the skin. It is one of the most dreaded postoperative complications. It is a major cause of morbidity and possible mortality especially in high output fistulae. The aim of this study was to assess the pattern of postoperative gut fistulae particularly on the clinical presentation, diagnostic, work up, managements, and outcomes.
Methods: It was a prospective non-randomized study of 52 consecutive patients collected in three and half years (from 1st January 2015 to 1st June 2018) in Al-Karama Teaching Hospital. The study involved patients who had postoperative fistula in the anterior abdominal wall. Originating from the digestive tract. All the patients were subjected to history and physical examination according to a data collection sheet.
Results: There were 32 males and 20 females mean age 40.96 and the mean hospital stay (14-45) days. Author found that 42.3% of cases were due to malignancy, around 30.7% were presented following laparotomy for trauma, three cases (5.8%) is due to surgery for inflammatory bowel disease (total colectomy), and 21.2% were due to miscellaneous. Regarding site of fistula, fourteen cases had single fistulae draining from midline laparotomy incision (26.9%). ten cases (19.3%) were miscellaneous conditions. Wound dehiscence and wound infection occurred in four cases (7.7%). Multiple Organ Failure (MOF) occurred in three cases and led to death.
Conclusions: Trauma and malignancy made the major two causes of postoperative fistulae in this study. The higher output fistula, the more incidence of complications, such as sepsis, electrolyte disturbances, skin excoriation and weight loss.

Keywords: Entero-cutaneous, Fistula, Gastro-intestinal, Postoperative

INTRODUCTION

Gastrointestinal cutaneous fistula is an abnormal connection between the stomach or intestines and the skin that can occur in fistulating Crohn's disease or as a result of radiotherapy or abdominal trauma but most common follows a surgical complication. Either as a leak from an anastomosis or an in-adventent eneteromy during dissection.[1] Post-operative entero-cutaneous fistula occurs in approximately 75-85% of cases.[2] A minority of them is caused by other etiologies including infection, malignancy, and radiation. While some fistulas may close spontaneously, most patients will eventually need surgery to resolve this pathology. Enterocutaneous fistulas (ECFs) can occur as a complication following any type of surgery on the GI tract.

Indeed, more than 75% of all ECFs arise as a postoperative complication, while about 15-25% is spontaneously occurring, and these fistulas which occurs post-surgery causes significant morbidity and mortality.[3] They are also a source of significant misery for both the

patient and caregiver. Morbidity and mortality following ECF is exceedingly high.[4] An estimated 90% of patients will experience an ECF-related morbidity ranging from skin excoriation, to dehydration, to sepsis. Moreover, the mortality attributable to an ECF ranges anywhere from 5-20% and is dependent on number of factors including underlying infection and fistula location.[5-7] In most series, mortality also appears to correlate with fistula output and location.

Mortality increases from 26% in low output fistulas to 50% for high output ones given the fluid, electrolyte and nutritional challenges associated with ECF management.

Mortality also correlates with location and decreases with more distal fistulas. While jejunal fistulas have the highest mortality at 29%, and are significantly more challenging to manage, the mortality from colonic fistula is the lowest at 6%.[8] There is no universal or well-established classification scheme for ECFs. Fistulas are generally classified anatomically, physiologically or by disease process.[9] Complex types are with multiple tracts with or without intervening abscesses or involving other organ systems.[10] The physiological classification is based on the volume of its output.[11,12] Aetiologically, the majority of enterocutaneous fistulas are iatrogenic (75-85%) while between 15 and 25% occur spontaneously.

The goals of therapy for patients with enterocutaneous fistulas are to correct metabolic and nutritional deficits, close the fistula, and reestablish continuity of the gastrointestinal tract. The treatment of ECF continues to be a challenging surgical problem. Hospital stay are long, wound infection and sepsis coexist and 5% to 20% mortality rate is considerable.[13]

The strategies for management of ECF include nutritional support, correction of electrolyte imbalances, recognition and treatment of sepsis.[14] The goals of therapy for patients with enterocutaneous fistulas are to correct metabolic and nutritional deficits, close the fistula, and reestablish continuity of the gastrointestinal tract.

The conventional therapy for Entero-Cutaneous fistula (ECF) in the initial phase is always conservative. Immediate surgical therapy on presentation is contra-indicated, because the majority of ECFs spontaneously close as a result of conservative therapy.[15-18] The presence of sepsis or local infection can also adversely affect the likelihood of closure. Other factors that can adversely affect prognosis include diabetes, corticosteroid use, and renal failure.[19,20]

However, opinion is divided on the effect of output on spontaneous closure-high output may or may not be associated with reduced closure rates. There is no adequate data about the extent of such problem among surgical patients. Author conducted this study to describe the pattern of surgical fistulae and their related factors.

METHODS

This prospective study was carried out in the surgical department of Al-Karama teaching hospital from 1st January 2015 to 1st June 2018. During this study period 52 patients who developed entero-cutaneous fistula following abdominal surgery in this hospital.

The inclusion of patients with gastrointestinal fistulae as a postoperative complication. Exclusion of patients with fistulae related to urinary tract problems. The definitive diagnosis of an ECF is usually made by visualizing the drainage of succus from the operative incision or from a drain site. This usually occurs between postoperative days 5 and 10. All patients were managed initially for 24 to 72hours with application of fistulae collection device, correction of fluid and electrolyte deficit, antibiotics and occasional blood transfusion, and patients with a proximal, high output fistula accompanied with a low albumin (<3.0g/dl) have more complications and are less likely to close their fistula spontaneously. Conversely patients with no comorbidities who have fistulas that are the result of a surgical procedure and are low output do more favorably with higher spontaneous closure rates.

Full clinical assessment included history taking emphasizing on the surgery that complicated by the fistula. The etiology whether, inflammatory, neoplastic, traumatic, related to biliary or pancreatic surgery or others. Examination of the fistula site, quantification of daily output, noting the consistency and color of the output and the state of the surrounding skin. Laboratory investigations such as complete blood count, fasting blood glucose, renal function test, liver function test and serum albumin level.

Radiological workup done using abdominal ultrasound to define fluid collections in most of the patients, abdominal CT-scan or MRI to define fistula origin. Fistulogram and biopsy from fistula was also used in some of the patients included in the study.

The anatomy of the fistula is defined prior to planning surgery. Contrast studies are performed in which water-soluble contrast material (Gastrographin) is administered through the fistula, orally and rectally.

After the full assessment then are managed with nutritional support. The introduction of total parenteral nutrition (TPN) by Dudrick SJ et al, revolutionized the treatment of patients with ECFs.[21] Fistulas may result in massive daily fluid and electrolyte losses especially of high-output fistulas can include dehydration, hyponatremia, and hypokalemia as well as metabolic acidosis. TPN has been universally adopted as a means of providing nutrition while promoting “bowel rest” and simplifying effluent management. While TPN reduce GI secretions by 30-50%, thereby reducing the incidence of dehydration and electrolyte imbalances.

Operation intervention wait 4-6weeks for spontaneous closure, fistulas with factors known to prevent spontaneous closure or those persisting for >2months (especially patients with high output fistula, fistula associated with distal obstruction, and wide tract fistula <2cm) are unlikely to close spontaneously, so surgical intervention is cornerstone of fistulae that had not closed spontaneously.

RESULTS

In gender distribution, 52 cases studied there were thirty-two (61.5%) males and twenty (38.5%) females with a male:female ratio of 1.6:1. Author found that (22) cases (42.3%) were due to malignancy, (16) cases (30.7%) were presented following laparotomy for trauma, three cases (5.8%) is due to surgery for inflammatory bowel disease (total colectomy), and eleven cases (21.2%) were due to miscellaneous causes such as: three cases complicated paraumbilical hernia repair (5.8%), two cases following closure of colostomy (3.8%), one case was due to iatrogenic faulty insertion of jejunostomy tube (1.9%), one case followed a complicated appendectomy (1.9%).

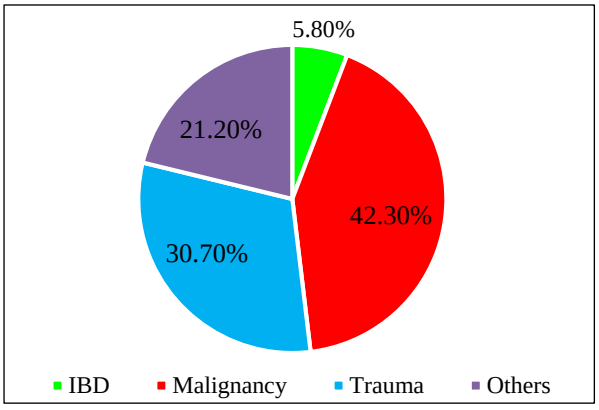

Figure 1: Etiology of fistula.

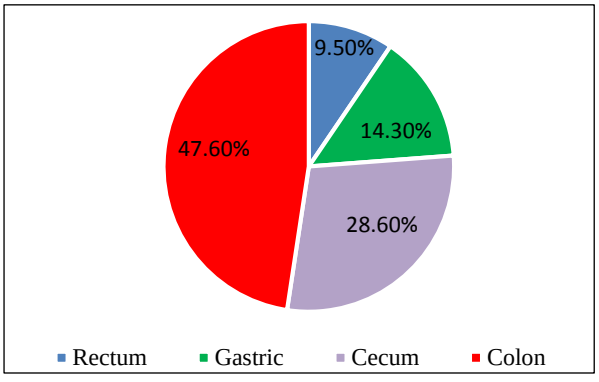

Figure 2: Types of malignancy as a cause of fistula.

Types of malignancy as a cause of postoperative fistula, 21 cases out of 52 patients were due to cancer, ten cases (47.6% of those with malignancy) were due to resection of colonic tumors, six cases (28.6%) were due to cecal tumors, three cases (14.3%) followed anterior resection for rectal malignancy and two cases (9.5%) followed billroth type II for resection of gastric cancer. As shown in Figure 2.

Types of trauma as a cause of postoperative fistula, sixteen cases develop fistula post laparotomy trauma. Five cases (31.3%) of which were due to bullet injury to the abdomen, four (25%) cases were due to shell injury after blast. Four cases (25%) were missed injuries which were not identified on the first laparotomy. Two case (12.5%) is due to injury to the tail of pancreas post splenectomy. One case (6.2%) is due to iatrogenic bowel injury after surgery for tubo ovarian sepsis with adhesions to the bowel.

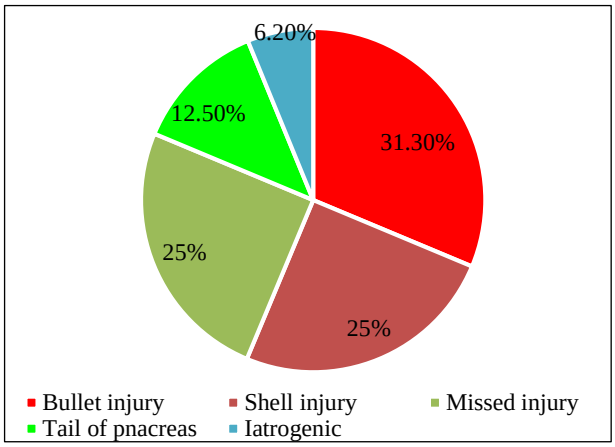

Figure 3: Types of trauma as a cause of fistula.

Site of Fistula (exit of effluent on the anterior abdominal wall), as shown in Figure 4, the effluent exit in each case is delineated. Some cases have more than one fistula exiting from more than one site. Fourteen cases had single fistulae draining from midline laparotomy incision (26.9%). Ten cases (19.3%) were miscellaneous conditions including two case of each of the following sites: midline incision+ bullet injury site, midline incision with drain site and shell entry and exit sites, abdominal wall defect due to degloving injury, infraumbilical transverse skin incision and pfannenstiel incision.

In state of skin surrounding effluent exit, most of cases were presented with erythema surrounding the exit occurs in fourty-six cases (88.5%). Ulceration and abscesses were found as well but to a lesser extent, weight loss in eighteen (35%) of cases and seventeen cases (32.6%) had skin excoriation. Electrolyte depletion in the form of hypocalcemia, hyponatremia and hypochloremia occurred in eleven (21%) of cases fistula output, thirteen cases (25%) had a high output (>500ml/day), fifteen cases (28.8%) had moderate output fistulae (200-500ml/day) and twenty-four cases (46.2%) were the low output type (<200ml/day). Consistency of fistula output: Fourty-four (84.6%) cases had feculent output. Two case (3.8%) had serous discharge mixed with blood which indicates pancreatic origin (high amylase content on

laboratory analysis). Four cases (7.7%) had gastric effluent and two case had fecal (3.8%) effluent. Complications like wound dehiscence and wound infection occurred in four cases (7.7%). Multiple Organ Failure (MOF) occurred in three cases and led to death.

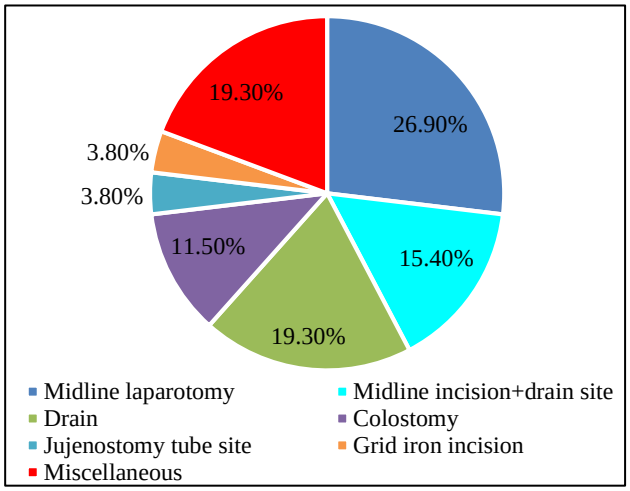

Figure 4: Site of fistula.

Radiological investigations included abdominal ultrasound underwent for all the cases (all the 52 patients). The finding of intra-abdominal fluid collection was found in thirty cases (57.7%).

Fistulogram had been done for only seven cases in the study through the external opening. two of the cases found to have connection to the cecum, three to the small bowel, one to the transverse colon and the other to the sigmoid colon. Nine cases underwent computerized tomography scanning. All of them showed fluid collection. A connection to the duodenum was found in one case. six cases found to have a connection to the small bowel. two case was found to have a connection to the cecum. Upon the constellation of clinical picture, examination of fistula site and output, nature of previous operations and radiographic features. The origin of the fistula was identified in all cases. Colocutaneous fistulae were the most common 36 cases (69.2%) followed by enterocutaneous fistulae.

All patients had a trial of conservative management and only ten patients (19.2%) needed surgical management in combination with the conservative treatment. Conservative management included fluid and electrolyte support, nutritional support (enteral nutrition or TPN), and antibiotics. Surgical treatment was given to the patients who failed to respond to the conservative management, included re-exploration of the abdomen, resection of the diseased bowel segments and reanastomosis.

Spontaneous closure within a period surgical closure was obtained in twelve cases (23.1%) without recurrence. In a small percentage only six cases (11.5%) persistence of the fistula occurred-three cases were referred to specialist GI centers. Death occurred in eight cases (15.4%), three cases was due to multiple organ failure after gastric resection for gastric CA. Another two cases died due to sepsis of pancreatic fistula. The rest died to their terminal illness and not as a direct relation to the fistulous disease.

DISCUSSION

Entero-cutaneous fistulae are the most dreaded and catastrophic complications of abdominal surgery.[19] The mean age in this study was 40.96years±16.54 with a range of 14-75years consistent with the finding of a study done by Ghazal AH et al, in which the mean age was 48 years.[20] In a study done by Visschers RG et al, the mean age of incidence was found to be 57years.[18] This difference may be attributed to the fact that the incidence of trauma is much higher in our country and that a considerable percentage of patients involved are from the military sector who are mostly young men.

The male to female ratio is 1.6:1 approximately consistent with the finding in Alexandria's study mean length of hospital stay in a study done by Draus et. Al was 22 day with a range of 1-71 days which is nearly inflammatory bowel disease (46%).[20] Inflammatory bowel disease was found in only three cases in this study. This is due to the much higher incidence of such diseases in their countries and due to the fact of our country being in a state of war that trauma arises as a major factor in the etiology of postoperative anterior abdominal wall fistulae. 46% of the patients in this study have low output fistulae with an output of 200ml/day or less approximately consistent with the finding of Ghazal AH et al study that shows 50% of cases are of the low output type.[20]

The most common complication found in this study was sepsis (60%), weight loss (35%) and skin changes (32%). Multiple Organ Failure (MOF) occurred in three patients and resulted in death postoperatively whereas skin complications were the most common one in the study done by Ghazal et al accounting for about 70% of cases.[20]

The site of origin of fistula was the large bowel in 36 (69.2%) of cases in this study followed by the small bowel, it opposed by a study conducted by Draus Jr JM et al, in which most cases were found to be related to the small bowel. This can be attributed to the differences in the etiological factors and the pathology behind such a postoperative complication with a higher frequency of colorectal malignancy in this study. No biliary fistulae were encountered during this study due its short period.

Conservative management had been instituted all cases either as an initial and definitive treatment as in 76.9% of cases or in concomitance with surgical therapy as in 23.1% of cases. Conservative treatment in the form of TPN or enteral nutrition individualized for each patient as he tolerates led to a success rate of 46.2% and

spontaneous closure in a period of 4-6weeks. Surgical therapy had been done for 23% of cases. Surgical closure without recurrence occurred in all those cases. In a study done by Taggarshe et al. The success rate of conservative management occurred in 75% of cases with low output fistula.[14]

Patients with high output fistula underwent surgical therapy and the success rate was 43%. The efficacy of treatment of enterocutaneous fistulae is influenced by the location of fistula, by the daily output, by the septic complications and using Total Parenteral Nutrition (TPN) can be the primary treatment or an effective adjunct supplement to the surgical management of postoperative small bowel fistulae.[23] The mortality rate in this study is 19.2% (5 patients). One case of pancreatic fistula following splenectomy died due to the complication of sepsis.

One case of gastric fistula following gastrectomy for advanced gastric malignancy died during the period of resuscitation due to multiple organ failure. Three cases died due to advanced colonic malignancy and not as a direct relation of the disease. As such case related mortality is 7.7%. Other studies showed mortality rates as stated by Okoye UO in a district hospital in Nigeria of 13.7% (5) and a study done by Li-Ling showed a mortality rate of 5.3%.[24,25]

CONCLUSION

Trauma and malignancy constitute the major two causes of such a complication in this study. The higher output the fistula the more incidence of complications such as sepsis, electrolyte disturbances, skin excoriation and weight loss. Radiological imaging and contrast studies are important tools in the diagnosis and delineation of the fistulous tract with its communications and the possibility of presence of distal obstructions.

Total parenteral nutrition plays a pivotal role in the treatment of such cases and its use is a key factor in the healing of fistulae especially low output ones. Spontaneous closure depends on the primary etiology of the fistula, its output, the age of patient and the presence of intercurrent illnesses, the site of fistula and the presence or absence of distal obstruction.

The higher output fistula, the more incidence of complications, such as sepsis, electrolyte disturbances, skin excoriation and weight loss. Surgical closure is an efficient way for dealing with high output fistulae and is associated with a high success rate. Failure of conservative management is also considered an indication for surgical closure.

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