Factors that Necessitate Early Surgical Intervention in Patients with Enterocutaneous Fistula

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ABSTRACT:

BACKGROUND:

Most enterocutaneous fistulas are postoperative in origin. Sepsis, malnutrition, and hydroelectrolytic deficit are still the most important complications to which patients with enterocutaneous fistulas are exposed. Knowledge of prognostic factors related to specific outcomes is essential for therapeutic decision making processes.

OBJECTIVE:

A study of enterocutaneous fistula characteristics in terms of etiology, classification (Types), management with special consideration on risk factors necessating early intervention rather than delayed.

PATIENTS AND METHODS:

This study was conducted in the General Surgical department in Al-Imamain Al Kadhimain Medical City at Baghdad, Iraq from March 201 ^to August 2020 .Fifty patients with enterocutaneous fistula were included in the study . Assessment of fistula site, output, and associated sepsis was done with focusing on the factors that require surgical intervention.

RESULTS:

50 patient were included in this study, 35 male (70%) and 15 female (30%) mean age was 45±12.4 yrs., Mean BMI was 30.5±4.2. 20 (40%) of the patients had fistula in the jejunum, while 25 (50%) in the ileum and the other 5 (10%) had colonic fistulas. 29 (58%) of patients had high output fistula, while 21 (42%) had low output fistula. Sepsis was present in 21 patients (42%). 12 out of 20 (60%) of patients with jujenal fistula needed surgical intervention, also 15 out of 29 (51.7%) of patients with high output fistula needed surgical intervention, while of the 21 patients who developed sepsis, 14 (66.6%) failed to heal without surgery.

CONCLUSION:

High output fistulas, fistulas associated with sepsis, fistulas of the jujenum required mostly surgical management and had high morbidity.

KEYWORDS: enterocutaneous fistula, management, sepsis.

INTRODUCTION:

Enterocutaneous fistulas are abnormal communications between the gastrointestinal tract and the skin. They are associated with considerable morbidity and mortality compared with other surgical conditions [(1)].

Fistula occur after surgery, inflammatory bowel disease, radiotherapy, trauma, and divereticulitis[(2)].

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Enterocutaneous fistula is associated with high morbidity and mortality, most common causes of death are sepsis, malnutrition and electrolytes disturbances[(3)].

Sepsis was the leading cause of death, increased Acute Physiology and Chronic Health Evaluation II (APACHE II) scores, low serum albumin and patient co-morbidity [(4)].

Priorities in the management of GI fistulas include restoration of blood volume and correction of fluid, electrolyte,; control of infection and sepsis with antibiotics; and nasogastric suction; control and protection of the surrounding skin; and provision of optimal nutrition by total parenteral nutrition (TPN) or enteral nutrition (EN) (or both)[(5,6)].

However, signs of generalized peritonitis, increasing fistula output, inability to provide adequate nutrition and sepsis are indications for surgical intervention.[7,8], non-healing enterocutaneous fistulas are associated with a foreign body, radiation, inflammation, infection, inflammatory bowel disease, [9].

The aims of surgery for enterocutaneous fistulas are: re-functionalization of the entire bowel, resection of the fistula with end-to-end anastomosis of the bowel and secure abdominal wall closure.[10] This has led to closure rates ranging from 5-20% following conservative management and 75-85% with operative treatment [11]. In spite of the improvement in mortality rates over the past 4 decades, leading institutions have reported high morbidity rates of over 85% [12]. Mortality has been attributed to sepsis, malnutrition and fluid and electrolyte imbalance. Predictive factors of high mortality are infectious and non-infectious complications, high output fistula and age [13]

1) Enterocutaneous (Iatrogenic) fistula

2) Enterocutaneous spontaneous fistula

Enteric fistulas may affect up to 30% of patients with Crohn's disease. Sometimes it's complicated by abscess ,so its necessary to convert these fistula/abscess complexes into a well-draining controlled fistula [1, 14].

Most of thses fistulae will not heal spontaneously and require resection.[15] .

3) Postoperative (Crohn's) enterocutaneous fistula

For later appearing septic fistulae more than 10 postoperative days), re-entry into the peritoneal cavity can be dangerous because of dense adhesions and the risk of multiple enterotomies [16].

Fistula closure

Fistula closure depends on enterocutaneous fistula characteristics. Factors believed to predict spontaneous fistula closure are as follows.

- Surgical Etiology.
- Free distal flow.
- Healthy surrounding bowel.
- Simple fistula with no associated abscess cavity.
- Fistula tract not epithelialized.
- Enteral defect <1 cm (with no discontinuity).
- Low fistula output.[17]

Magnesium deficiency is also common in these patients and should be actively sought and treated as necessary [18]. Enteral feeding is not only safe but may improve anastomotic healing/ strength [19,20].

PATIENTS AND METHODS:

This study is a prospective study conducted in the General Surgical department in Al-Imamain Al Kadhimain Medical City at Baghdad, Iraq from March 2018 to August 2020.

50 patients with enterocutaneous fistula of various etiologies were studied, cases collected from different teams.

Parameters studied included patients demographic profile, fistula output, biochemical parameters (hemoglobin, urea, creatinine, electrolytes, liver function test and albumin) and outcome. The description of fistula included cause, anatomical location, fistula output, complications, and outcome.

Parameters for diagnosis of sepsis diagnosis were clinical (fever, tachycardia, tachypnea, and abdominal pain) and laboratory findings (leukocytosis).

Definition of variables

Dependent variables were spontaneous closure (defined as closure of enterocutaneous fistula without an operation), need for operative treatment, and death. Our aim was to determine risk factors associated with those dependent variables.

The independent variables examined included:

- gender (male/female)
- Degree of co-morbidity. Co-morbidity was classified into minor and major
- Origin (duodenal, jejunal, ileal, or colorectal)
- Output during 24 h (<200 ml: low,> 500 ml: high)
- Underlying pathology and type of primary surgery.
- Type of initial operation (urgent /elective)
- Serum albumin (g/dl)
- Presence of malnutrition and electrolyte imbalance at diagnosis.
- Development of sepsis during the course of disease.
- Use of octereotides

Clinical Management In general, our approach to Enterocutaneous fistula conformed to the 3-stage approach described by Schecter et al. [21]

Phase 1: recognition and stabilization.

Phase 2: anatomical definition and decision.

Phase 3: definitive operation.

RESULTS:

50 patient were included in this study, 35 male (70%) and 15 female (30%) mean age was 45±12.4 yrs., Mean BMI was 30.5±4.2. Type of primary surgery was tumor resection in 14 (28%) patients, trauma in 27 (54%) patients, and the others 9 (18%) for other causes such as mesenteric cyst, intestinal obstruction with failed conservative management, stricture, this is shown in Fig 1

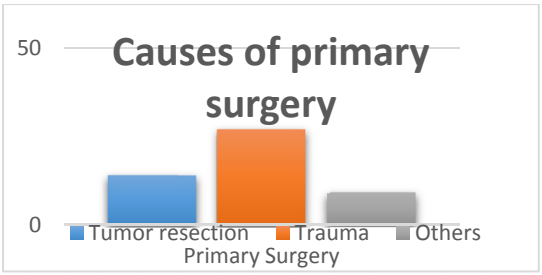

Fig 1:Causes of primary surgery in patients included in our study.

Table 1 depicts these figures according to site of enterocutaneous fistulas origin within the gastrointestinal tract.

Table 1: outcome of the enterocutaneous fistula of various sites within the gastrointestinal tract.

Site of origin	Number of patients	Spontaneous closure	Operative closure	Deaths
Jejunum	20	5	12	3
Ileum	25	19	5	1
Colon	5	2	2	1

Table 2: Characteristics of the patients and enterocutaneous fistula.

Variable	Number	Percentage
Site of origin		
Jejunum	20	40%
Ileum	25	50%
Colon	5	10%
Fistula output		
High (>500ml/24hr)	29	58%
Low(<200ml/24hr)	21	42%
Initial (causative) operation		
Elective	19	38%
Urgent	30	60%
Sepsis		
Yes	21	42%
No	29	58%
Hypoalbuminemia		
Yes	28	56%
No	22	44%
Electrolyte imbalance		
Yes	27	54%
No	23	46%
Hypertension	11	22.2%
Diabetes	4	8%

Table 3: Number and percentage of patients who needed surgical closure of fistula, who had specific features.

Variable	Number of patients with surgical closure/total
Site	
Jejunum	12/20 (60%)
ileum	5/25 (25%)
Colonic	2/5 (40%)
High output	
Yes	15/29 (51.7%)
No	4/21 (19.1%)
Sepsis	
Yes	14/21 (66.6%)
No	5/29 (17.2%)

Chances for spontaneous closure were lower for jejunal and high output enterocutaneous fistula, compared to other sites of origin and low output enterocutaneous fistula, patients who developed sepsis had also lower chance of spontaneous closure.

DISCUSSION:

Enterocutaneous fistulas are one of the most difficult complications that a surgeon can face. Even in successfully treated cases, inherent morbidity and the nature of the disease result in lengthy hospitalizations [22,23].

Site of origin of the fistula also plays a crucial role. Risk of hydro electrolytic imbalance, malnutrition, and sepsis increases in these patients [24]. Overall, small bowel fistulas have a lower chance of spontaneous closure and require longer courses of treatment before spontaneous closure, compared to colonic fistulas which have a higher chance of spontaneous closure, and usually heal earlier.

Kuvshinoff BW et al reported spontaneous closure rate of 40% for colonic fistulas, which is in accordance with our results [25].

Mawdsley JE, Hollington P et al. [26] reported 68% spontaneous closure for low output fistulae, versus 26% only for high output fistula, their result was in line with

our results, we reported need for surgery in 51% of high output fistula and only 19% for low output fistula.

Martinez JL et al. reported spontaneous closure rates for patients without sepsis almost double the rate of those with sepsis (49% versus 26%, respectively) [22].

A rational conclusion to be drawn from our study is that the group of patients with unfavorable predictive factors such as high output, jejunal site, should be considered for operative treatment after a reasonable period of conservative management.

Ideally, surgical alternatives for patients with enterocutaneous fistulas will be aggressive and radical. When possible, resection of involved loop(s) of bowel and anastomosis should be attempted, because this approach has provided the lowest failure rates in most series.

CONCLUSION:

Enterocutaneous fistulas are among the most challenging problems a surgeon can face, enterocutaneous fistulas remains a complex problem that is optimally management using a careful and interdisciplinary approach.

High output fistulas, fistulas associated with sepsis, fistulas of the jujenum required mostly surgical management and had high morbidity.

Recommendations

For patients with fistulas or high output or patients present with sepsis complicating their fistulas or for patients with junenal fistulas early surgical intervention is preferred to decrease associated morbidity and mortality.

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