Clinical Profile of Postoperative Enterocutaneous Fistulas

Prashant Mukadam*, Shakib Masu*, Atisha M. Patel**

Abstract

Background : Enterocutaneus fistula (ECF) is a result of complex intraperitoneal infection process. Even with modern and advanced surgical suturing techniques, staplers, newer antibiotic therapy and modern investigations, mortality of the disease remains up to 50%. Though there is a reduction in the number of enterocutaneus fistulas post-operatively by percentage, once the fistula develops, morbidity and mortality are very high. The serious sequences lead us to study the disease at our set up and compare the results with international works. **Methodology :** Patients having enterocutaneus fistulas and admitted in municipal general hospitals of Ahmedabad were observed and data were collected in the proforma consisting details of patient's history, clinical findings, pathological and microbiological findings, conservative management, operative management, complications, and outcome. **Results :** Observations and analysis of the data of present series was very interesting and important aspects were compared with standard series. Importance of total parenteral nutrition, total gut irrigation, and earliest definitive surgery, was established. Mortality was 44% in this series, mostly caused by serious infectious diseases like typhoid fever and tuberculosis. **Conclusion :** Patients can be helped to recover from this dreaded disease by early diagnosis and management of malnutrition, fluid and electrolyte imbalance, infection process and simultaneous medical diseases

Key Words : Enterocutaneus fistula

Introduction :

Fistula means an abnormal communication between two epithelialized surfaces. Gastrointestinal fistulas are defined as an abnormal communication between two hollow organs or a hollow organ and the skin, the latter is better known as enterocutaneous fistula. Enterocutaneous fistula can be classified into congenital and acquired. Acquired fistulas are more common and can be further classified into post operative, traumatic and spontaneous. Amongst these 75 to 85% are post operative fistulas. Prompt recognition of post operative fistulas is essential. It is not unnatural for a surgeon to avoid confronting an operative failure by adopting an attitude of wait & watch . Failure to recognize this complication or inability to manage it properly leads to septicemia, malnutrition and subsequently death. On the other hand immediate surgical repair is also associated with failure in most of the cases. So every surgeon must be aware of post operative changes suggestive of fistula formation. [1] Once diagnosis is established, a stepwise approach should be followed, the basis of success is the control of infection, optimal nutritional support and optimal timing of appropriate surgical intervention. Treatment with octreotide is used in developed countries. [2]

Once enterocutaneous fistula is diagnosed, it is associated with high rate of morbidity and mortality; however it has consistently been declining because of recent advances in the management, availability of multiple options for nutritional support particularly parenteral nutrition, [3] improvement in wound healing and fistula drainage, development of more potent antibiotics and better surgical techniques. Definitive surgical intervention should only be performed after 4-6 weeks of initial event because most of the fistulas heal spontaneously by this time. [4] Improper decision of early closure of fistula leads to another fistula or recurrence due to ongoing inflammatory process. Thus it is wise to delay surgery until the acute inflammatory process in the operative field subsides and also to buy time to improve nutritional status of the patient. [5]

This series aims to study cases of enterocutaneous fistulas in terms of etiology, site and course, and particularly its management and output. This is a humble effort on our side, in a fast developing field of management of enterocutaneous fistulas.

Aims of the study

Enterocutaneous fistulas are an infrequent but not rare companion of the surgeon who performs gastrointestinal surgery. This study was performed on 25 patients admitted in hospital with enterocutaneous fistula or who developed fistula during their course of hospitalization.

Aims of this study are as following: (1) To study the common etiology for enterocutaneous fistula. (2) To study the relation between the site of the fistula and its outcome. (3) To find out the nutritional aspect in the management of these fistulas and its influence on outcome. (4) To study the relation of operative intervention regarding timing and its outcome and (5) to learn the overall progress and outcome of different cases of enterocutaneous fistulas.

Methodology

Twenty five cases of enterocutaneous fistula admitted in one of the Municipal General Hospitals of Ahmedabad city, India, were studied during a period of two years.

All cases were studied according to a general proforma which included etiology, the investigations carried out and management and outcome. After necessary ethical

* Associate Professor, Department Of General Surgery, AMCMET Medical College Ahmedabad
** Intern Doctor, Smt. NHL Medical College and V.S. Hospital, Ahmedabad
Correspondence : mukadampn@yahoo.com

permission, Data were collected in the proforma consisting details of patient's history, clinical findings, pathological and microbiological findings, conservative management, operative management, complications, and outcome. However gastric, pancreatic, biliary and anorectal fistula and stomas were excluded from this study.

Observations

In our study, no patient was found to be below 15 years of age. 32% of the patients were in the age group of 16-30 years. 36% were in the age group of 31-45 years and 28% were in the age group of 46-60 years. 4% of the patients were more than the age of 65 years.

Duration of pain or acute symptom to surgery is vital cause of fistula. [6]

The study shows, there was higher incidence of fistula when duration between acute symptom and surgery was between 24-48 hours. The patients, who had a traumatic fistula, have presented within 24 hours of the occurrence of the condition. Three patients had been referred to our institute with fistula. They had been operated as an emergency at other hospital. Out of all the patients, 88% of them had emergency surgery while 12% underwent an elective surgery.

Table1: Etiology of fistula formation among study participants

No.	Etiological factor	Frequency	Percentage (%)
1.	Enteric perforation	7	28
2.	Tuberculous perforation	7	28
3.	Peptic perforation	3	12
4.	Trauma	4	16
5.	Malignancy	2	8
6.	Surgical trauma	2	8

Enteric perforation was the most common cause (28%) of fistula in our study. Abdominal tuberculosis remains the second most common cause of fistula formation in our study.

In our study only two patients were admitted with malignancy, as malignancy patient are usually referred to specialized institute. One patient was admitted with obstruction but relieved by conservative treatment and operated as planned surgery. Lastly surgical trauma was the least common cause of fistula (8%). Surgery for ectopic pregnancy and incisional hernia repair had lead to formation of such fistula. (Table 1)

The commonest site of fistula in our study was ileum (32%). Next common sites were duodenum, jejunum and the ileo-ceacal region (20% each).

Fistulas maybe divided into high output (>500mL per day), moderate output (200-500mL per day) and low output (<200mL per day) groups. In our study 13 patients had high output fistula in whom common site was duodenal and jejunal while 12 patients had low output fistula for whom common site was ileum.

In our study 10 patients had associated medical disorders which affect the outcome, duration of fistula closure and lead to fluid electrolyte imbalance, nutritional impairment and they influence the management protocol as total gut irrigation and aggressive total parentral nutrition cannot be given to these patients. In our study, most of the patients had mixed etiology out of them E.Coli and Klebsiella were the commonest organisms isolated. Others were campylobactorjejuni, enterococci, and S. typhi. In 3 cases no bacteria were isolated. In our study of 25 patients, initially all the patients were given conservative treatment which consisted of I.V fluid, TPN, [7] Blood transfusion and antibiotics.

Distal enema was given to the patient in whom we were not suspecting colonic fistula. [8] Total Gut irrigation (TGI) was recommended in suspected those patient who had no distal obstruction.

Most of the patients responded to conservative management effectively. Those who did not respond were offered surgical intervention in form of resection and anastomosis, colostomy or excision of mature tract.

Table 2 : Impact of management approach on healing of fistula

Management	Present Series		
	Healing of fistula	Non-Healing of fistula	Total
Conservative	9	7	16
Operative	5	4	9
Total	14	11	25

The study shows that 16 patients were treated in the form of conservative line of treatment out of them 9 patients have closure of fistula (62%) rest of the 9 patients were treated by operative intervention, when patients' general condition optimized out of them 5 patients had fistula closure (56%). (Table 2)

Table 3 : Association between output of fistula and healing

	Conservative		Operative	
Output of fistula	High	Low	High	Low
No. of Pts.	8	8	5	4
Healing seen in	3	6	2	3

Table 3 shows that healing of the fistula was seen more in patients with a low output fistula and who were treated conservatively amongst them. Campos suggested that low output fistula are 3 times more likely to heal but in our study it showed that low output fistula are twice more likely to heal spontaneously than high output ones. [9]

In our study, conservative line of treatment was carried out in form of enteral as well as parenteral nutrition: which were iv fluid, lipid emulsion, amino acid infusion, blood transfusion and enteral nutrition given by oral support. [10]

Table 4 : Supportive treatment in management of enterocutaneous fistula

Method used for treatment	Frequency	Percentage
Oral Support	13	52
IV fluid	25	100
Blood transfusion	24	96
Amino Acid	21	84
Intralipid	12	48
Total Gut irrigation	14	56

As table 4 suggests, initially all the patients treated as conservative modality. Total gut irrigation was given to 14 patients. Most of the patient had received total parenteral nutrition. Enteral nutrition was given to 13 patients. Lipid emulsion was given to limited patients because of cost. [11, 12]

The patients who were treated initially conservatively but later on surgical intervention done in form of resection and anastomosis, colostomy, excision of muco-cutaneous track and revision of closure.

The study shows that out of 25 patients, 11 patients expired (44%). Out of them 8 patients were died due to septicemia while other patients were expired due to cardiac disorder, respiratory failure and diabetic ketoacidosis.

Discussion

In this study of 25 patients, the commonest age of presentation of ECF was 31-45 years. This may be due to the common occurrence of infectious diseases at this age.

Delay of the surgery after the symptoms leads to an increased frequency of an ECF. This may be due to the effects of peritonitis, peritoneal abscess and reduction of mesenteric arterial and venous flow resulting in mucosal ulceration due to increased inter-abdominal pressure. [6] The study shows that there were higher chances of fistula when there was an emergency surgery due to an obstruction of perforation. This in turn may be due to late presentation of the patient, wide intraperitoneal soiling, unprepared bowel, and uncontrolled associated medical condition.

Enteric perforation was the most common cause of fistula in our study. Most of the patient had fever for which they have taken treatment outside and unfortunately they were not responded to the drugs administered. Moreover, due to prolonged illness beforehand they were in a debilitated general condition and were in toxaemia- all these lead to higher incidence of fistula postoperatively. In this patient intestinal wall was oedematous and inflamed and chance of missed imminent perforation were more likely. In our study, we concluded the site of fistula reviewing the operation carried out, the fistula output, the color and consistency of output. The commonest site of fistula in our study was ileum (32%). Next common sites were duodenum, jejunum and the ileo-ceacal region (20% each).

This was due to high rate of enteric fever and Koch's abdomen in our study as compared to Sober et al where the commonest sites were ileum and rectosigmoid junction. This may be explained by higher incidence of inflammatory bowel disease like Crohn's and ulcerative colitis and diverticulitis.

The bacteriological study of the tract showed that the infectious agent was coliform organisms which are normally present in the gut. Definitive treatment was offered in terms of total gut irrigation and surgical intervention. In our study we had given TGI to 16 patients out of these 16 patients TGI was carried out successfully in 14 patients. In the remaining two patients TGI had to be omitted due to vomiting and breathlessness. In the patient with TGI, early enteral nutrition had been given for reducing effective cost of management and less chance of fluid electrolyte imbalance and malnutrition.

The above table-4 shows that fourteen patients were given total gut irrigation and have higher success in terms of fistula closure (78.5%) while patient who were not given total gut irrigation had very low incidence of fistula closure (21.25%). Isolated surgical procedure is never carried out. It is always in combination of adhesiolysis with resection and anastomosis of excision of track. [5, 13] The study showed that resection and anastomosis with adhesiolysis had low success rate when compared to excision of mature track. This is due to inflamed friable intestine, peritonitis, associated nutritional imbalance. Three patients were allowed to mature fistulous track and later on when patient become stable definitive surgical treatments carried out shows higher rate of fistula closure.

The complications associated with ECFs are studied in form of local and general. The general complications were fluid and electrolyte imbalance, septicemia and malnutrition while local complication is skin excoriation.

The study showed that septicemia, malnutrition and fluid electrolyte imbalance were major cause of morbidity and mortality. These were because of poor availability of TPN and higher antibiotic due to poverty. The study showed that patients who had low output fistula had higher chances of fistula closure (9/12) compared to high o/p fistula (5/13). The patients who had high o/p fistula had had low incidence of fistula closure because of associated fluid-electrolyte imbalance, nutritional disorder. Comparison of mortality with the study done by Edmund et al [14] showed that mortality in our study was 10% higher which may be due to malnourishment [15, 16], and inadequate total parenteral nutrition as this is very costly in our set up. Also, lethal complications of infectious diseases are a cause.

When mortality of the patient is divided in the form of patients having high and low output fistula, mortality was approximately 30% more in patients having a high output fistula. This result was comparable to the study of Edmund et al. [14]

Conclusion & Recommendation

In the present study 25 cases of enterocutaneous fistula in last 2 years were studied at the municipal general hospital. The patients who were presented late and also those whose

surgical procedure was done in an emergency had a higher incidence of fistula. Ileal perforation due to enteric fever was the most common cause of enterocutaneus fistulas. The second most common cause of fistula was intestinal tuberculosis. Enterocutaneous fistula was usually associated with malnutrition, fluid and electrolyte imbalance, infection and associated medical disorder contribute to higher mortality rates.

All were post-operative fistulae so the suspicion of internal opening was easy. High output fistula were common in duodenum and jejunum. Enteral nutritional support has been definitely low cost nutritional support. Associated medical disorder worsens the outcome of such fistula. High output fistula had definitive role in terms of high cost of treatment and higher mortality. Early surgical intervention and specific definitive surgery [17] had higher rate of failure and mortality.

With conservative management and nutritional support in terms of intravenous fluid, TPN and enteral, and maturation of tract, control of infection shows higher rate of fistula closure spontaneously or after surgical intervention after 45-60 days.

Limitations of study

Therapeutic use of somatostatin, use of collagen plug, [18], endoscopy [19] and laparoscopy [20] in patients with ECFs had not been tried to manage our patients but their optimum use may improve the results.

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