



ETIOLOGY, TREATMENT, AND OUTCOME OF POST-OPERATIVE ENTEROCUTANEOUS FISTULAE: A PROSPECTIVE STUDY

General Surgery

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ABSTRACT

Background: Approximately 75% of enterocutaneous fistula (ECF) occur following surgery. Due to the high morbidity and mortality associated with ECF, prompt and effective treatment is important. **Objectives:** To study the outcome and management of patients with enterocutaneous fistula. **Methods:** Total 50 patients developing the enterocutaneous fistula following surgery were included. All patients were treated either conservatively or operatively by various means and varying period of time. Treatment was focused on the correction of dehydration, controlling sepsis, management of electrolyte imbalance and nutritional support. **Results:** out of 50 patients mean age was 39.20±20 years. The study was male preponderance (70%). Around 62% of patients had small bowel fistula (20 ileal, 6 duodenal, 5 jejunal) and 38% were large bowel fistula. 72% patients had High-output fistula. the most common complication was skin excoriation seen in 36% of patients followed by Intra-Abdominal Abscess (24%). 24% of skin excoriation was seen in high-output fistula which was not significant ($p=0.33$). 14% IAA was seen in low output fistula which was also not significant. out of 50 patients 8 patients were died during follow up and 42 were recovered. **Conclusions:** Conservative management with emphasis on improvement of nutrition, control of sepsis, management of fluid and electrolyte balance and control of fistula output is first line of management.

KEYWORDS

Enterocutaneous fistula, Enteral Treatment, Resection, Nutritional support, Sepsis.

INTRODUCTION

The enterocutaneous fistula (ECF) is an irregular communication between two epithelialized surfaces -intestinal tract and the skin. Nearly 75% of all ECFs are the direct result of either laparoscopic or open surgery with an anastomotic leak. [1] In contrast only 25% of all enterocutaneous fistula are secondary to inflammatory bowel disease, diverticular pathology, trauma, radiation and malignancy. [2] Enterocutaneous fistula is a very serious complication and is associated with high morbidity and mortality rates. Difficulty related to enterocutaneous fistula is sepsis, malnutrition, fluid and electrolyte disorders. [3] Adequate nutrition, control of sepsis, fluid and electrolyte balance and skin protection are appear to be a crucial factors in survival whether or not the patient requires definitive surgery.[3] A treatment that could shorten fistula closure time would be highly beneficial and also causes considerable reduction in hospital cost. We come across this condition as a complication of routinely performed surgeries and outcome of management would depend upon the site of communication with the enterocutaneous tract as well as the general condition of the patient.

MATERIALS AND METHODS

This prospective descriptive study conducted in 50 patients presenting with entero-cutaneous fistula and treated during the period February 2021 to April 2022 in department of Surgery. Purposive sampling technique was used.

Inclusion Criteria

Patients that developed the condition following surgery in the hospital as well as those operated in other institutes were included.

Exclusion Criteria

Patients with esophageal, biliary, pancreatic, perianal, internal fistula, and those who developed fistula spontaneously were excluded.

METHODOLOGY

Details like anatomical location of fistula, etiology of fistula formation, fistula output and outcome of management were recorded. A fistula output of 500 ml/day was taken as the cut off between high and low output fistulas. In the study, patients were treated by various means either conservatively or operatively and for a varying period of time according to department protocol. Treatment was focused on the correction of dehydration, control of sepsis, management of electrolyte imbalance by appropriate fluid resuscitation, maintenance of proper nutrition and skin care. After stabilization of patient, fistula anatomy delineation and intra-abdominal abscess drainage (if present) was drained by radiology department. Decision was taken to keep

patient on conservative treatment or to operate by consultant in command.

STATISTICAL ANALYSIS

Analysis of data was done by using SPSS software ver. 22. Data were statistically described in terms of mean ($\pm$ SD), frequencies (number of cases) and percentages when appropriate. Comparison of quantitative variables between the study groups was done using Student t test for independent samples if normally distributed. For comparing categorical data, Chi square test was performed. A probability value (p value) less than 0.05 was considered statistically significant.

RESULTS

Table 1- Demographic and Clinical Details of the study participants (N=50)

Parameters	N (%)
Mean age	39.20±20
Gender Males	35 (70)
Females	15 (30)
Small bowel Fistula	31 (62)
Large bowel Fistula	19 (38)
Low-Output fistula	14 (28)
High-Output fistula	36 (72)

As per table 1 out of 50 patients mean age was 39.20±20 years. The study was male preponderance (70%). Around 62% of patients had small bowel fistula (20 ileal, 6 duodenal, 5 jejunal) and 38% were large bowel fistula. 72% patients had High-output fistula.

Table 2- Comparison of Small and Large Bowel fistula with Output

Output	Small Bowel Fistula	Large Bowel Fistula	p-value
High Output (36)	24	12	0.01*
Low Output (14)	7	7	

As per table 2 there were 36 patients (72%) with high output fistula and 14 patients (28%) with low output fistula. Duodenal and jejunal fistulae accounted for 62% of high-output fistulae. Colonic fistula was more likely to have a low output ($p=0.01$)

Table 3- Association between Complications and Fistula Output

Output	Skin excoriation (18)	Cellulitis (3)	Intra-Abdominal Abscess (12)
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High Output (36)	12	2	5
Low Output (14)	6	1	7
p-value	0.33	0.72	0.11

As per table 3 the most common complication was skin excoriation seen in 36% of patients followed by Intra-Abdominal Abscess (24%). 24% of skin excoriation was seen in high-output fistula which was not significant ($p=0.33$). 14% IAA was seen in low output fistula which was also not significant.

Table 4- Comparison of Mortality between Output fistula and Treatment

Output	Recovered	Died	p-value
High Output (36)	31	5	0.01
Low Output (14)	11	3	
Enteral treatment (42)	37	5	0.01
Parenteral treatment (8)	6	2	

As per table 4 out of 50 patients 8 patients were died during follow up and 42 were recovered. The reason of mortality can be multiple co-morbid conditions. There was a significant association with high and low output fistula with mortality similarly around 84% of patients has enteral treatment among which 5 patients died which was significant ($p=0.01$). In the high-output fistula group, mean duration of hospital stay was 38.8 ± 4.6 days as compared to 24.0 ± 2.9 days in low-output fistula patients.

DISCUSSION

In Western countries, approximately 75%-85% of patients undergoing surgery of GI tract develop ECF as a complication. Spontaneous fistula accounted for the remaining 15%-25%. All cases, except one, in the present case series, developed an ECF following an operative procedure. In an earlier study held by Manisegaran et al, it was found that 88% of ECF occurred in the postoperative period.[4]

In the present study around 62% of patients had small bowel fistula (20 ileal, 6 duodenal, 5 jejunal) and 38% were large bowel fistula. 72% patients had High-output fistula. Reber et al. in their study found that ileum was the most frequent site for fistula formation, representing 50% of all fistulas.[5] A similar distribution is also reported by Roback et al., in a study including 55 patients. [6]

Narsos et al. also narrated a mortality rate of 48% for jejunal fistulas and 18% for ileal fistulas.[7] Patients with high output fistulae have a higher frequency of fistula-associated complications such as fluid and electrolyte imbalance, infection, and skin excoriation. The fistula closure rate is also lesser. Fazio et al. reported that mortality rate was twice in high-output fistula patients as compared to low-output fistula patients. [8]

In the present study the most common complication was skin excoriation seen in 36% of patients followed by Intra-Abdominal Abscess (24%). 24% of skin excoriation was seen in high-output fistula which was not significant ($p=0.33$). 14% IAA was seen in low output fistula which was also not significant. Hollender's series (1983), the presence of intra-abdominal infection was observed in 63% with a mortality rate of 82%. [9]

Lorenzo et al. and Tarazi et al. in that the timing of operation and selection of the operative procedure depends on the type of fistula, response to conservative management, and the state of the patient. [10, 11]

In the present study out of 50 patients 8 patients were died during follow up and 42 were recovered. The reason of mortality can be multiple co-morbid conditions. There was a significant association with high and low output fistula with mortality similarly around 84% of patients has enteral treatment among which 5 patients died which was significant ($p=0.01$). Studies conducted in previous decade shows that the overall mortality rate for postoperative fistulas of the small intestine averages 30%. [4,12]

CONCLUSION

Most patients respond to conservative management; however, surgical intervention is required in a number of patients when conservative methods for healing of fistulas fail. Control of sepsis, management of fluid, and electrolyte imbalance, meticulous skin care and nutrition support allows spontaneous fistula closure and low mortality.

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