

Frequency of Complications of Ileostomy in the Management of Ileal Perforation Secondary to Typhoid Fever

Ileal
Perforation
Secondary to
Typhoid
Fever

Bakhtawar Urooj¹, Nadia Mehreen², Munazza Laraibe¹, Zarak Khan¹, Muhammad Anwar¹ and Zohra Samreen³

ABSTRACT

Objective: To determine the frequency of complications of ileostomy in the management of ileal perforation secondary to typhoid fever in a tertiary setting.

Study Design: Descriptive Study

Place and Duration of Study: This study was conducted at the Department of Surgery, Bolan Medical College, Quetta from February 2020 to February 2021 for a period of one-year.

Materials and Methods: Ninety patients with single or multiple ileal perforation due to typhoid fever confirmed by clinical features, laboratory tests and abdominal x-ray were included in this study. Patients were observed for complications of ileostomy like skin excoriation, stoma retraction, stenosis, prolapse, peristomal sepsis, parastomal hernia, necrosis and death for two months.

Results: The average age of the patients was 40.30±10.14 years. Skin excoriation was the commonest complication that was observed in 18.9% cases followed by stoma retraction 10%, parastomal hernia 10%, stenosis 4.4%, prolapse 3.3%, peristomal sepsis 6.7% and necrosis 2.2%. Mortality was observed in 6.67% (6/90) due to stoma.

Conclusion: In this study skin excoriation was the commonest complication. Early surgery and adequate resuscitation are the important factors for successful management of patients with ileal perforation. Primary closure of perforation is a preferred technique in clinically stable patients with a single perforation with minimal soiling of the abdominal cavity, to avoid complications related to stoma.

Key Words: Ileal, Perforation, Typhoid, Fever, Skin, Excoriation

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INTRODUCTION

Ileal perforation is a frequently encountered surgical emergency in the developing countries. It is a hole in the wall of ileum leading to signs and symptoms of peritonitis, including severe abdominal pain and tenderness. Ileal perforation due to typhoid fever is common in Pakistan due to high incidence of typhoid fever.^{1,2} Complicated and untreated cases of typhoid fever usually results in single or multiple ileal perforations.² Typhoid fever is a severe febrile illness caused by ingestion of salmonella typhi, a gram negative bacillus.

¹. Department of Surgery / Gynae² / Dermatology³, Sandeman Provincial Hospital Quetta, Balochistan.

Correspondence: Bakhtawar Urooj, Department of Surgery, Sandeman Provincial Hospital Quetta, Balochistan.

Contact No: 0315-3939326

Email: bakhtawarshah101@gmail.com

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It has got an average incubation period of 10-14 days. Regions of the world like ours, lacking clean and safe drinking water supplies and adequate waste disposal system have increased incidence of typhoid fever.²

A recent study showed that up to 65 percent of ileal perforation results due to untreated typhoid fever.² Another study reported that 62 percent of solitary ileal perforations are due to typhoid fever and mortality is reported up to 32 percent if not treated.³

There are various surgical procedures for the management of ileal perforation. These include primary repair, primary ileostomy and segmental resection with end to end anastomosis. But ileostomy is a widely accepted surgical option and regarded more successful procedure as compared to primary repair in terms of overall mortality, morbidity and duration of hospital stay.¹ Ileostomy is life-saving surgical procedure in which the end or loop of ileum is diverted to an artificial opening of 2 to 3 cm usually on the lower right side of the anterior abdominal wall. Stoma is the end of the ileum which connects to the surface of the skin.

The complications of ileostomy are not just common but also difficult to manage. Serious complications may require reoperation. The main disadvantage of performing ileostomy is that it requires further surgical procedure for its closure and associated with nutritional disturbances and emotional trauma. Commonly

reported complications of ileostomy are skin excoriation (17.64%), stoma retraction (3.50%), stenosis (1.17%), prolapse (2.94%), peristomal sepsis (5.80%) and necrosis (0.58 %).^{4,5} Death has been reported worldwide due to ileostomy.⁶

However, in Balochistan, studies on estimation of stoma related complications secondary to typhoid fever, so far, have not been conducted as per our best knowledge. Most studies come from western countries which may not be true frequency of complications of ileostomy in Pakistan.

The aim of this study is to evaluate the frequency of complications of ileostomy in terms of stoma related complications and mortality. The result of this study will help the clinicians to estimate the frequency of complications and to promptly manage these complications in a less hygienic environment, prevailing at hospitals in Balochistan. This study will also help to enhance knowledge about the frequency of complications of stoma secondary to typhoid fever in our cross cultural settings.

MATERIALS AND METHODS

Study Design: Descriptive Study

Settings: Department of Surgery, Bolan Medical Complex Hospital, Quetta

Duration: One year from 3-Feb-2020 to 3 Feb-2021

Inclusion Criteria:

- Only adult cases, both gender, age ranging from 18 to 60 years.
- Patient with single or multiple ileal perforation due to typhoid fever confirmed by clinical features, laboratory tests and abdominal x-ray.

Exclusion Criteria:

- Confounding conditions which can influence
- Ileal perforation due to tuberculosis
- Ileal Perforation due to trauma or gunshot cases
- Ileal Perforation due to ingestion of toxic substances and poisoning

Data Collection Procedure: A total of 90 cases that fulfill the inclusion criteria was enrolled in the study from Department of Surgery Bolan Medical Complex Hospital, Quetta. Informed consent about the surgical procedure and its complication was obtained and demographics were noted. A detailed history including general physical examination, abdominopelvic examination and associated symptoms, routine Laboratory investigations, Typhidot test and abdominal x-ray in standing position was taken to confirm the diagnosis. After establishment of diagnosis of ileal perforation secondary to typhoid fever, prompt surgical intervention was done. Patients was observed for complications of ileostomy.

Data Analysis Procedure: Data entry and analysis was on computer packages IBM SPSS version 20.0. Mean and Standard Deviation (S.D) was computed for quantitative variable like age and duration of typhoid fever. Frequency and percentage were calculated for

gender and postoperative complications such as skin excoriation, stoma retraction, stenosis, prolapse, peristomal sepsis, parastomal hernia and death.

RESULTS

Most the patients were 31- 50 years of age. The average age of the patients was 40.30 ± 10.14 years and mean duration of typhoid fever was 3.68 ± 0.91 weeks as shown in Table-1.

Table No.1: Descriptive statistics analysis of data

Statistics		Age (Years)	duration of typhoid fever days/week
Mean		40.30	3.68
Std. Deviation		10.142	.910
95% Confidence Interval for Mean	Lower Bound	38.18	3.49
	Upper Bound	42.42	3.87

Rate of stoma retraction was high in above 45 years of age as compared to below and equal to 45 years of age cases (18.8% vs. 5.2%; $p=0.04$) while other complications were not statistically significant between age groups including the rate of skin excoriation 17.2% and 21.9% in ≤ 45 and >45 years of age respectively, stenosis 1.7% and 9.4% in ≤ 45 and >45 years of age respectively, prolapse rate 5.2% and 0% in ≤ 45 and >45 years age respectively, rate of peristomal sepsis 5.2% and 3.1% in ≤ 45 and >45 years of age respectively, necrosis 1.7% and 3.1% in ≤ 45 and >45 years of age respectively, rate of parastomal hernia was 12.1% and 6.3% in ≤ 45 and >45 years of age respectively and death rate was 3.4% and 12.5% in ≤ 45 and >45 years of age respectively as presented in Table-2.

Table No.2: Frequency of complications of ileostomy in the management of ileal perforation secondary to typhoid fever age groups

Complications	Age Groups (Years)		P-Value
	≤ 45 n=58	>45 n=32	
Skin excoriation	10 (17.2%)	7 (21.9%)	0.591
Stoma retraction	3 (5.2%)	6 (18.80%)	0.040
Stenosis	1 (1.7%)	3 (9.4%)	0.092
Prolapse	3 (5.2%)	0 (0%)	0.191
Peristomal sepsis	5 (5.2%)	1 (3.1%)	0.317
Necrosis	1 (1.7%)	1 (3.1%)	0.666
Parastomal hernia	7 (12.1%)	2 (6.3%)	0.378
Death	2 (3.4%)	4 (12.5%)	0.099

Rate of stoma retraction was also high in male as compared to female (18% vs 0%; $p=0.005$) and death was also significantly high in male than female (12% vs 0%; $p=0.023$) other complications rate including skin excoriation was 24% in male and 12.5% in females,

stenosis 6% in males and 2.5% in females, prolapse 4% in males and 2.5% in females, peristomal sepsis 6% in males and 7.5% in females, necrosis 2% in males and 2.5% in females and parastomal hernia 12% in males and 7.5% in females as shown in Table 3.

Table No.3: Frequency of Complications of Ileostomy in the Management of Ileal Perforation Secondary to Typhoid Fever by Gender

Complications	Gender		P-Value
	Male n=50	Female n=40	
Skin excoriation	15(24%)	5(12.5%)	0.166
Stoma retraction	9 (18%)	0(0%)	0.005
Stenosis	3(6%)	1(2.5%)	0.423
Prolapse	2(4%)	1(2.5%)	0.694
Peristomal sepsis	3 (6%)	3 (7.5%)	0.777
Necrosis	1 (2%)	1 (2.5%)	0.873
Parastomal hernia	6 (12%)	3 (7.5%)	0.480
Death	6 (12%)	0 (0%)	0.023

Rate of complications was not statistically significant with respect to duration of typhoid fever including skin excoriation 11.1% in <3 and 24.1% in >3, stoma retraction 16.7% in <3 and 5.6% in >3, stenosis 8.3% in <3 and 1.9% in >3, prolapse 5.6% in <3 and 1.9% in >3, peristomal sepsis 5.6% in <3 and 7.4% in >3, necrosis 5.6% in <3 and 0% in >3, parastomal hernia 2.8% in <3 and 14.8% in >3, death rate 11.1% in <3 and 3.7% in >3 as shown in Table-4.

Table No.4: Frequency of Complications of Ileostomy in the Management of Ileal Perforation Secondary to Typhoid Fever by Duration of Typhoid Fever

Complications	Duration of typhoid fever		P-Value
	≤3 n=36	>3 n=54	
Skin excoriation	4 (11.1%)	13 (24.1%)	0.124
Stoma retraction	6 (16.7%)	3 (5.6%)	0.085
Stenosis	3 (8.3%)	1 (1.9%)	0.144
Prolapse	2 (5.6%)	1 (1.9%)	0.338
Peristomal sepsis	2 (5.6%)	4 (7.4%)	0.730
Necrosis	2 (5.6%)	0 (0%)	0.080
Parastomal hernia	1 (2.8%)	8 (14.8%)	0.062
Death	4 (11.1%)	2 (3.7%)	0.168

Skin excoriation was the commonest complication that was observed in 18.9% cases followed by stoma retraction 10%, parastomal hernia 10%, stenosis 4.4%, prolapse 3.3%, peristomal sepsis 6.7% and necrosis 2.2%. Mortality was observed in 6.7% (6/90) due to stoma.

DISCUSSION

In this study the average age of the patients was 40.30 ± 10.14 years and mean duration of typhoid fever was 3.68 ± 0.91 weeks. There were 55.56% male and 44.44% female. In Rahman et al [7] the common age groups affected was 1-50 years' age group (5 patients) and 61-70 years age groups (5 patients). The incidence in males was slightly greater than females. Male to female ratio was 2.5:1.

Onset of symptoms and time of presentation in the hospital are important prognostic factors. An early presentation holds a good prognosis. Unfortunately, in developing countries, the presentation to hospital is usually late with fully blown peritonitis, some cases may present with septicemia and multi-organ failure. Current literature strongly favors the surgical management only of enteric ileal perforation.[8,9] The age incidence is more in second decade. The perforation is common in 2nd and 3rd decade as evidenced by other studies.[10] The commonest cause of ileal perforation in a series was typhoid fever accounting for 53.5% of cases. The other causes of ileal perforation in this study are 25% nonspecific, 17.8% traumatic, 3.5% TB. Typhoid fever accounted for 56.6% of cases of ileal perforation in the series by Karmakar.[11]

In present study frequency of complications of ileostomy in the management of ileal perforation secondary to typhoid fever, skin excoriation was the commonest complication that was observed in 18.9% cases followed by stoma retraction 10%, parastomal hernia 10%, stenosis 4.4%, prolapse 3.3%, peristomal sepsis 6.7% and necrosis 2.2%. In another study it was reported that the commonly reported complications of ileostomy are skin excoriation (17.64%), stoma retraction (3.50%), stenosis (1.17%), prolapse (2.94%), peristomal sepsis (5.80%) and necrosis (0.58 %).[4,5] Death has been reported worldwide due to ileostomy.[6] In Rahman et al study[7] the common complications are wound infection, burst abdomen, faecal fistula and respiratory complications. Wound infection is the commonest complication in his study, with a complication rate of 21.4% in six patients, Burst abdomen rates about 10.7%, faecal fistula rates about 3.5% and respiratory complications about 14.2%. Santillana in his series reported a rate of 71.9% in 96 patients.[12]

In this study mortality was observed in 6.67% due to stoma. The complications and mortality due to ileostomy have been reported up to 18.2 percent and 4 percent, respectively.[4] These figures are much lower than the rates reported other studies such as 6.8% from Nepal, and 10.5% from India in another study.[13] In Jain et al study[6] the mortality rate was 17.1% which was significantly affected by perforation- admission interval of more than 48 hours, number of perforations and occurrence of postoperative complications. In present study rate of stoma retraction was high in males as compare to female and death was also significantly high in male than female. Our study showed a male preponderance of ileal perforation; this observation was

similar to previous reports by Beniwal et al.^[13] and Ugochukwu et al.^[14] but this was at variance with the report of Edino et al.^[15] who reported more female predominance. The reason for this difference is not completely understood but Beniwal et al.^[13] reported that males are more exposed to risk and genetic predisposition also heightens the risk of infection. Again, the majority of the cases were within the paediatric age range (first and second decade of life); this was similarly reported by Ugochukwu et al.^[14] Edino et al.^[15] and Ahmed et al.^[16]

In this series the outcome of best results in terms of mortality, morbidity and post-operative complications were found to be in patients with ileostomy. The primary closure of perforation was associated with an overall 32% complication rate whereas only 17% in ileostomy group. Ileostomy proved to be the most successful procedure in this study in terms of overall mortality and morbidity, this is supported by Bhansali et al study^[17], Kalid et al study^[1], Meh et al.^[18]

CONCLUSION

In this study skin excoriation was the commonest complication that was observed followed by stoma retraction, parastomal hernia, stenosis, prolapse, peristomal sepsis and necrosis. Mortality observed in this study was 6.67% due to stoma. Early surgery and adequate resuscitation are the important factors for successful management of patients with ileal perforation. This study proposes that ileostomy may be given priority over other surgical options especially in those moribund patients who present late in the course of their illness, have more than one perforation with massive fecal contamination of the abdominal cavity. Primary closure of perforation is a preferred technique in clinically stable patients with a single perforation with minimal soiling of the abdominal cavity.

Author's Contribution:

Concept & Design of Study: Bakhtawar Urooj
 Drafting: Nadia Mehreen,
 Munazza Laraibe
 Data Analysis: Zarak Khan, Muhammad
 Anwar, Zohra Samreen
 Revisiting Critically: Bakhtawar Urooj, Nadia
 Mehreen
 Final Approval of version: Bakhtawar Urooj

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