



Original Article

Protective Ileostomy in Ileal Perforation and Its Outcome Compared to Primary Repair

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Abstract

A hospital based single blinded randomized study of 50 patients admitted to GMC & GGH, KADAPA with ileal perforation (diagnosed per-operatively) during the period of November 2016 to November 2018. All the 50 patients of ileal perforation were divided into two groups on consecutive sampling basis: Group A (primary repair with protective ileostomy and Group B (only primary repair). Detailed data of each patient including presentation, operative findings, procedures performed, postoperative outcome and HPE was entered on a specially designed proforma. The main outcome measures found significant were postoperative complication, hospital stay, psychological impact and mortality.

Conclusion: The construction of a temporary loop ileostomy to provide defunctioning for repair of ileal perforation reduces the incidence of fatal complication like faecal fistula.

Defunctioning ileostomy is a good option and life saving procedure.

Keywords: Protective Ileostomy; Faecal fistula; Ileal perforation; Primary closure; End-to-end anastomosis.

Introduction

Ileal perforation is a serious complication and remains a significant surgical problem in all developing and under developed nations and associated with high morbidity and mortality. Perforation of terminal ileum is one of the leading cause of peritonitis especially in developing countries like India. Typhoid is the most common cause for this dreaded condition; tuberculosis, trauma, and non-specific enteritis are other causes.¹ Most series reporting simple closure of the perforation or resection and anastomosis in case of multiple perforations,

reporting satisfactory results but it is not free of complications. Of all the postoperative complications reported, faecal fistula remains the most life threatening; the rate of its occurrence of around 12% with a very high mortality rate. In view of this situation, a shift in favour of a defunctioning protective ileostomy following primary closure of the perforation has been observed in recent years.¹ Ileostomy is a life-saving procedure. This study is focused on evaluating advantages of defunctioning protective ileostomy following primary closure that has been observed in recent

years, and to study its impact and to compare its outcome in terms of postoperative complications, hospital stay and mortality, with that of primary surgery without a protective ileostomy

Materials and Methods

This is a hospital based single blinded randomised study of 50 patients admitted to GMC&GGH KADAPA with ileal perforation (diagnosed per-operatively) during the period from November 2016 to November 2018.

Criteria for inclusion

All patients admitted to GMC&GGH KADAPA for ileal perforation (diagnosed per-operatively)

Criteria for exclusion

- 1) All children below 14 years of age
- 2) Refusal by the patient to participate in the study.
- 3) Refusal by the patient for construction of ileostomy.

All patients underwent a complete history and clinical examination by the surgical team. All the details were entered in a pre-designed proforma which also includes demographic data, therapeutic intervention performed, per operative findings, course in hospital and follow up.,

All patients included in the study underwent investigations in the form of Hb, BT, CT, RBS, blood urea, serum creatinine, blood grouping and cross matching, erect X ray abdomen, ECG, ultrasound abdomen and pelvis and Widal. A diagnosis of typhoid was made only if Widal test was positive, or Salmonellae were isolated from blood or urine and if histopathological evidence of typhoid perforation was found.

Patients were divided in 2 groups, Group A = protective ileostomy following primary surgery, Group B = Primary surgery alone. Primary surgery includes primary closure of perforation or resection and end to end anastomosis.

Consecutive patients were entered in subsequent groups and followed up closely for postoperative complications like wound infection and dehiscence, faecal fistula and other stoma related complications, mortality rate and hospital stay.

All the data were analyzed by using mean values, standard deviation, standard error and Chi-square test/contingency table analysis. The values thus calculated will be compared at appropriate levels of significance for the corresponding degree of freedom. Suitable software will be employed for the analysis

Results

Fifty patients of ileal perforation (diagnosed per-operatively) admitted between November 2016 and November 2018 were included in the study. Patients were grouped in two groups on consecutive sampling basis.

Group A: primary repair with protective ileostomy
Group B: only primary repair

Primary repair includes both primary closure of perforation and resection and anastomosis.

Etiology

The commonest cause of ileal perforation was typhoid followed by non-specific, tuberculosis and diverticulitis.

The distribution is shown in table 1.

Table 1: Etiology and demography of ileal perforation

Diagnosis	Number of cases	Percentage
Typhoid	25	50
Non-specific	19	38
Tuberculosis	05	10
Diverticulitis	01	02
Total	50	100

Age and sex incidence

The age of patients ranged from 18 to 75 years with the mean being

38.8 years. Ileal perforation commonly occurred in the second and third decade of life with 56% of patients between the age of 20 and 40.

There was male preponderance in this study with male:female ratio being 23:2.

Per-operative findings

On laparotomy there was gross contamination of peritoneal cavity in most of the cases. Peritoneal cavity was found to contain copious quantity of pus and faecal material. Feculent peritonitis was seen in 20 (40%) of cases and

purulent peritonitis in 30 (60%) of cases. A single perforation was noted in most of cases. 39 (78%) of patients had single perforation, 7 (14%) had two perforation, 3 and more than three perforation was seen in 4 (8%) of cases.

Most of the patients on laparotomy had a unhealthy inflamed and friable bowel. 36 (72%) patients had associated ileitis adjacent to perforation. Only 14 (28%) patients had a healthy bowel.

Table 3(a): Number of perforation

Number of perforation	Number of cases	Percentage
Single	39	78
Two	7	14
Three	3	6
Four	1	2

Table 3(b): Bowel condition

Bowel	Number of cases	Percentage
Unhealthy	36	72
Healthy	14	28

Histopathological examination

HPE of either the resected specimen or the edge biopsy was done in all the patients. A report suggestive of typhoid was seen in only 6 cases out of 25 cases of typhoid. A diagnosis of tuberculosis was made in 5 cases, diverticulitis in one case and rest of the cases showed features of non-specific inflammation with no conclusive diagnosis

Table 4: Histopathological examination

Diagnosis	Yes	No	Total
Typhoid	6	19	25
Tuberculosis	5	0	5
Non-specific	19	0	19
Diverticulitis	1	0	1

Complications

Post-operative complications were encountered in varying proportions in both the groups. Faecal fistula was the most dreaded fatal complication. The overall rate and incidence of complication is detailed in table below.

Table 5: Post-operative complications

Complications	Group A (loop ileostomy) n=25		Group B (primary repair) n=25	
	No. of patients	%	No. of patients	%
Wound infection	6	24	15	60
Wound dehiscence	2	8	9	36
Skin excoriation	16	64	-	-
Ileostomy prolapsed	1	4	-	-
Ileostomy retraction	3	12	-	-
Electrolyte	5	20	1	4
Faecal fistula	-	-	10	40
Psychological symptoms	5	20	7	28
Death	4	16	11	44

Complications overall were noted in 33% of patients in Group A and 35% in Group B patients. (P value 0.808)

The mean hospital stay for all patients was 17.4 days ranging from 1 to 60 days.

The mean hospital stay for patients in Group A was 12.6 days ranging from 1 to 25 days that for Group B was 22.2 days ranging from 5 to 60 days. (P value 0.011)

Overall mortality in the present study was 30% with 44% mortality observed in Group B and 16% was observed in Group A. (P value 0.031)

Overall psychological symptoms was seen in 24% of patients with 28% observed in Group B and 20% in Group A. (P value 0.508)

Table 5: Outcome of study

Outcome	Group A	Group B	P value	Significant
Hospital stay	12.6	22.2	0.01	Yes
Mortality	30%	44%	0.03	Yes
Psychological symptoms	20%	28%	0.50	No
Complications	33	35	0.80	No

Discussion

Typhoid fever is the predominant cause of non-traumatic ileal perforation while other causes include tuberculosis, non-specific inflammation, radiation enteritis, Crohn’s disease and obstruction.

non-specific inflammation were found to be

leading causes with the incidence of 62% and 26% cases respectively.² This study confirms findings of similar studies. In this study the commonest cause of ileal perforation was typhoid fever accounting for 25 (50%) of cases, followed by non-specific inflammation and tuberculosis which accounted for 19 (38%) and 5 (10%) respectively. Bhalerao, Karmakar in their study reported the same finding.³

There was a male preponderance in this study with male:female ratio being 23:2. Perforation commonly occurred in the second and third decades of life with 56% of patients between the ages of 20 and 40.

Histopathological examination of either the resected specimen or the edge biopsy of the perforation was done in all the patients. A report suggestive of typhoid was seen in 6 specimen. Diagnosis of tuberculosis was made in 5 cases and the rest showed features of non-specific inflammation. On laparotomy there was gross contamination of peritoneal cavity in most of the patients. Peritoneal cavity was found to contain copious quantity of pus and faecal material. Feculent peritonitis was seen in 20 (40%) of cases whereas 30 (60%) of cases presented with purulent peritonitis.

Most of the literature available report a single perforation in the terminal ileum.^{4,5,6,8} In present study a single perforation was noted in 39 (78%) of cases. Two and more than two perforations were noted in 11 (22%) of cases. Chowdhury et al reported 41% of cases with single perforation, 33% with double perforation.⁵ Out of the 50 cases studied only 14 (28%) patients had a healthy bowel on laparotomy. Rest 36 (72%) patients had a bowel which was inflamed and friable.

Of all the post-operative complications, faecal fistula remains the most dreaded with an incidence of around 12%.¹ Reasons may be dehiscence of anastomotic or primary repair, synchronous impending perforation in adjacent inflamed bowel that has been missed at the time of initial surgery or development of metachronous perforation of diseased ileum

during post-operative period.⁴

Faisal et al reported 6 cases of faecal fistula (FF) that resulted in death of all 6.¹ Abdul Ghaffar et al reported 6 cases of FF that resulted in 4 deaths in his study.⁵ Tariq Farooq⁹ reported 2 deaths out of 4 cases of FF in his study.

This study also substantiates these findings. FF developed in 10 out of 25 cases in group B where no protective ileostomy was done to protect the closure of perforation or end to end anastomosis. None of the patients in group A with protective ileostomy developed FF. 6 out of 10 patients of FF succumbed leading to a higher mortality in group B when compared to group A. In present study 24 out of 25 cases developed ileostomy specific complications such as skin excoriation (64%), ileostomy diarrhoea leading to electrolyte imbalance (20%), ileostomy prolapse (4%) and retraction of stoma (12%). Wound infection was also noted in (24%) of patients. Ileostomy related complications were in accord with the various studies that reported similar complication rate.^{5,6,7,8,9}

Patients in Group B also had higher morbidity. Wound infection (60%), Outcome in a series of 79 patients of non-traumatic ileal perforation by Wani et al., typhoid and wound dehiscence (36%), faecal fistula (40%) were the complications suffered by patients in Group B. As discussed earlier FF was the most dreaded complication with 10 (40%) of cases being recorded among which 6 succumbed to death.

Mean hospital stay for all the patients was 17.4 days. Patients in group B had a very high mean hospital stay of 22.2 days, whereas for patients in group A it was 12.6 days. The longer duration of hospital stay in group B was mainly due to wound dehiscence and FF. In group A, longer stay those who had excessive skin excoriation and peristomal ulceration. Mean stay was found to be statistically significant with a P value of 0.011.

The overall mortality rate in present study is 30%. The reported mortality after primary closure ranges from 7.9% to 31%. However most authors report a mortality of about 25%.⁶

In present study the mortality in group B was 44% as compared to 16% in group A. Patients in group B had a very high mortality, which was mainly due to the occurrence of post-operative FF in (40%) of cases.

Patients in Group B (44%) had thrice the mortality when compared to Group A (16%) which was statistically significant with a P value of 0.031.

Conclusions

Temporary defunctioning protective ileostomy in cases of ileal perforation plays a vital role in reducing the incidence of complications like Faecal Fistula. This helps reduce mortality in patients undergoing surgery for ileal perforation. Ileostomy specific complications, however increase the post-operative morbidity. Temporary defunctioning protective ileostomy is life saving and procedure of choice in moribund patients with poor general conditions

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