



ROLE OF ILEOSTOMY IN OUTCOME OF PATIENTS OF ILEAL PERFORATION PERITONITIS

General Surgery

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ABSTRACT

Introduction: Acute abdomen secondary to perforation peritonitis is a challenging surgical emergency. Although surgery is accepted as the definite treatment, there is controversy regarding the surgical procedure of choice. This study is focused on evaluating the impact of protective ileostomy in ileal perforation and to compare its outcome in terms of postoperative complications, hospital stay with primary surgery without ileostomy.

Methods: Patients were divided into two groups: Group A = defunctioning protective ileostomy following primary surgery, Group B = Primary surgery alone. Primary surgery included primary closure of perforation site or resection and end to end anastomosis. Per operative findings were noted which included type of peritoneal fluid, number of perforations and condition of the adjacent bowel. Patients were followed up closely for postoperative complications like wound infection and dehiscence, faecal fistula and other stoma related complications, mortality rate and hospital stay.

Results: Post-operative complications including general and local complications were encountered in both groups of patients. Wound infection, wound dehiscence and respiratory complication were more common in patients who underwent resection anastomosis with ileostomy. Burst abdomen, septicaemia and faecal fistula were more common in patients in whom primary closure was done. The most common stoma complication noted in this study were stomal prolapse, stomal retraction and stomal stenosis. In peristomal complication skin excoriation, peristomal dermatitis and peristomal hernia were observed.

Conclusion: Though ileostomy related complications lead to an increase in patient morbidity, the advantages of the procedure outweigh the specific complications. Moreover, ileostomy related complications can be significantly reduced in patients by pre-operative patient education and counselling regarding stoma; proper fashioning of stoma intra-operatively and adequate post-operative stoma care. Therefore, we prefer temporary protective defunctioning ileostomy in patients with ileal perforation, especially in those with poor general condition and who have multiple perforations with unhealthy gut.

KEYWORDS

Ileal perforation peritonitis, Ileostomy.

INTRODUCTION:

Acute abdomen secondary to perforation peritonitis is a challenging surgical emergency. Perforation of terminal ileum is one of the leading causes of hollow viscus perforation peritonitis. Among cases of hollow viscus perforation, duodenal and gastric perforation account for most of the cases (60-80%) in some series, followed by ileal, appendicular and large bowel.^[1] Typhoid is recognized as the most common cause for this condition and is common in underdeveloped countries. Tuberculosis, obstruction, non-specific enteritis and trauma are other causes in the list.^[1,2,3] In developed countries most common etiology remains vascular strangulation, foreign bodies ingestion, diverticular disease of the small bowel, Meckel's diverticulum, Crohn's disease, malignant disease, post radiation and iatrogenic.^[3]

Most case of typhoid perforation belong to poor socioeconomic people of rural area^[2] where unavailability of hygienic food and water and reluctant nature of patients delay the diagnosis and management of the disease. Patients presenting to the emergency department after being maltreated by quacks with multiple irritant antibiotics and steroid lead to multiresistant strains of salmonella bacilli.

The disease has an abrupt onset and a rapid downhill course with a high mortality if not treated. Although surgery is accepted as the definite treatment, there is controversy regarding the surgical procedure of choice. Most series reporting simple closure of the perforation or resection and anastomosis, in case of multiple perforations, report satisfactory results. This procedure though appears appealing, especially in an emergency setup, it is not free of complications. In view of this alarming situation, a shift in favor of a defunctioning protective ileostomy following primary closure of the perforation has

been observed in recent years.^[4, 5, 6, 7, 8, 9, 10, 11] Ileostomy is a life-saving procedure, particularly in those cases where there is fulminant enteritis and peritonitis of long duration.

The present study is aimed at evaluating the role of ileostomy in outcome of patient of ileal perforation peritonitis. The study has been conducted several years before in our hospital. Now it is done to observe the trend in changing pattern of approaching patients with ileal perforation. This study is focused on evaluating the impact of protective ileostomy in ileal perforation and to compare its outcome in terms of postoperative complications, hospital stay with primary surgery without ileostomy.

MATERIALS AND METHODS:

The present study "Role of ileostomy in outcome of patients of ileal perforation peritonitis" was carried out in 105 patients of ileal perforation peritonitis admitted in surgical ward of Department of General Surgery, Sanjay Gandhi Memorial Hospital associated with Shyam Shah Medical College, Rewa, (M.P.) from 1st June 2019 to 31st May 2020.

All patients who presented to Surgical Emergency Ward with abdominal pain were admitted and the essentials of registration completed. Patient's detailed history, general examination and abdominal examination was done and recorded.

All the patients included in the study underwent the following investigations: Hb, BT, CT, RBS, blood urea, serum creatinine, blood grouping and cross matching, erect X ray abdomen, ECG, ultrasound abdomen and pelvis and Widal test.

Simultaneously, patients were resuscitated with correction of fluid and electrolyte balance. A nasogastric tube was placed for decompression of gastric contents and urinary catheterization done to monitor urine output. Patients received a loading dose of intravenous third generation cephalosporin, metronidazole and proton pump inhibitors. An informed consent was taken for the exploratory laparotomy and for the possibility of stoma when indicated.

SELECTION CRITERIA:

All patients admitted in surgical ward of Department of General Surgery, Sanjay Gandhi Memorial Hospital associated with Shyam Shah Medical College, Rewa, (M.P.) for ileal perforation (diagnosed pre-operatively).

The following patients were excluded from the study:

- Very high-risk patients with ischemic heart disease or diabetes failure who were postponed for anaesthetic reasons;
- Refusal by the patient to participate in the study;
- Incomplete data and
- Patient leaving against medical advice.

Patients were divided into two groups:

- Group A = defunctioning protective ileostomy following primary surgery,
- Group B = Primary surgery alone. Primary surgery included primary closure of perforation site or resection and end to end anastomosis.

Laparotomy was performed by a midline incision, all dirty yellow faecal or purulent material was aspirated from peritoneal cavity then thorough peritoneal lavage done with warm saline. General survey of peritoneal cavity was made. Per operative findings were noted which included type of peritoneal fluid, number of perforations and condition of the adjacent bowel. When performing ileostomy, the loop brought out sufficiently before everting it so that the formal stoma formed was well above the skin level leading to less skin excoriation. Drain was kept in pelvis. Abdomen was closed by vicryl size 1 and skin was closed with interrupted ethilon sutures.

Patients were followed up closely for postoperative complications like wound infection and dehiscence, faecal fistula and other stoma related complications, mortality rate and hospitals stay.

RESULTS:

Aetiology:

In this study among 105 patients, typhoid was the most common cause of ileal perforation which was seen in 46 cases (43.8%). Ileal perforation due to tuberculosis was present in 13 patients (12.38%), and in 2 cases ileal perforation was due to trauma. Non-specific cause of perforation was observed in 44 cases (41.90%).

Age:

Maximum number of patients of ileal perforation were in 21 years -30 years of age group. 60 patients (57%) were between 10 years to 30 year of age group, the youngest case was 08 years old and oldest was 80 years old.

Sex:

In this study, most cases of ileal perforation were males 82 cases (78.09%) and females cases were 23 in number (21.90%). The M: F ratio was 3.56:1.

Socio-economic status:

Majority (90.47%) of cases of ileal perforation were from lower socioeconomic class and only 10 cases were from middle socioeconomic class.

Presenting symptoms:

All cases presented with pain in abdomen (100%). Fever was present in 73 patients (70%), vomiting in 55 patients (52%), constipation in 64 patients (60%) and diarrhoea in 34 patients (32%).

General examination findings:

In the present study, on general examination, 77 patients (73.33%) had dehydration of various degrees, 34 patients (32.38%) presented with hypotension, tachycardia and pallor was observed in 40 patients (38.09%) each.

Per-abdominal findings:

In this study, abdominal distension (95.23%) and tenderness (95.23%) were the commonest signs of perforation seen in 100 patients. Guarding was present in 90% of cases, rigidity in 88.57% cases, free fluid in 68.57% and obliteration of dullness was present in 55.23% cases

Widal reaction:

Widal test was done in all the patients in whom ileal perforation was diagnosed. Widal was positive in 46 out of 105 cases of ileal perforation.

Gas under diaphragm:

In this study, gas under diaphragm was seen in x-ray chest and erect x-ray of abdomen in 94 (89.25%) cases and in x-rays of 11 patients (10.48%) pneumoperitoneum was not seen. The reasons could be due to adhesions around perforation, sealing of perforation and reabsorption of gases due to delayed presentation.

Operative finding:

On exploratory laparotomy peritoneal cavity was found to contain copious quantity of faecal and purulent material. Feculent peritonitis was seen in 49 patients (46.66%) whereas 34 patients (32.38%) presented with fecopurulent peritonitis, 20 patients (19.04%) had purulent peritoneal collection and only two patient had blood in peritoneal cavity. Late presentation may be owing to delayed referral of the patient or may be due to non-availability of efficient health care as is seen in tropics.

Condition of bowel:

In this study, among 105 patients, 44 cases (41.90%) had oedematous bowel, 46 cases (43.80%) presented with healthy bowel and in 15 (14.28%) patients bowel was friable with gangrenous changes.

Number of perforations:

Amongst the cases in this study, 76 cases (72.38%) had single perforation. In 20 cases (19.04%) two sites of ileal perforation were present and in 9 cases (8.5%) more than two sites of perforation.

Site of perforation:

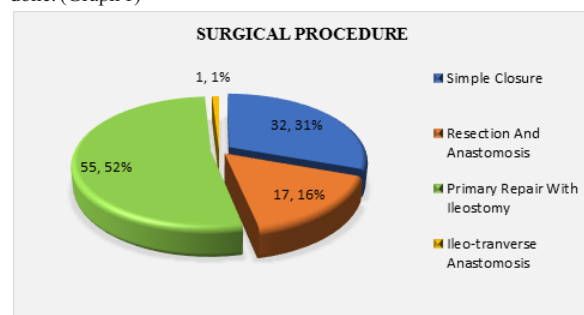
Among all 105 patients, in 70 cases (66.66%) the site of perforation was within 16cm-30cm from I-C junction, in 25 cases (23.80%) the perforation site was within 15cm distance from I-C junction, in 8 cases (7.61%) perforation site was within 31cm-45cm from I-C junction and in 2 cases the perforation site was more than 45cm from I-C junction.

Size of perforation:

In majority of cases, size of perforation was found between 0.5 cm -1 cm size followed by >1cm size in 24% cases and <0.5cm size in only in 8 (7.6%) cases.

Operative procedure:

In most of the cases i.e. 55 cases (52.3%) primary repair with ileostomy (PR+IL) was done. Simple closure was done in 32 cases (30.5%). Resection anastomosis with ileostomy was done in 17 cases (16.19%) while in one case ileo-transverse anastomosis with ileostomy was done. (Graph 1)



Graph 1: Operative Procedure

Post-operative complications:

Post-operative complications including general and local complications were encountered in both groups of patients.

Respiratory complications like pleural effusion was seen in 13 cases (12.38 %), respiratory infection was present in 14 cases (13.33%) and

lungs abscess was present in two cases (19.03%). Septicaemia was observed in 10 cases (9.52%). Electrolyte imbalance was present in 10.95% of ileostomy cases and was not seen in any cases in whom simple closure was done.

Wound infection was the most common local complication present in 43 patients (40.19%) followed by skin excoriation in 20 cases (27.39%) with ileostomy. Wound dehiscence was observed in 24 patients (22.85%). Faecal fistula was the most dreaded complication which was observed in 11 cases (10.47%). (Table 1)

Table 1: Distribution Of Case According To Postoperative Complication

S. No	COMPLICATIONS	PROCEDURE					
		Ileostomy (N = 73)		Simple Closure (N = 32)		Total (N = 105)	
		Frequency	%	Frequency	%	Frequency	%
1.	Respiratory Infection	10	13.88%	04	12.5%	14	13.33%
2.	Septicaemia	06	8.2%	04	12.5%	10	9.52%
3.	Electrolyte Imbalance	08	10.95%	-	-	08	7.6%
4.	Pleural Effusion	08	10.95%	05	15.62%	13	12.38%
5.	Lung Abscess	01	1.35%	01	3.12%	2	19.03%
B. Local		Ileostomy (N = 73)		Simple Closure (N = 32)		Total (N = 105)	
		Frequency	%	Frequency	%	Frequency	%
1.	Wound Infection	31	42.46%	12	37.5%	43	40.19%
2.	Wound Dehiscence	17	23.28%	07	21.87%	24	22.85%
3.	Skin Excoriation	20	27.39%	-	-	20	27.39%
4.	Burst Abdomen	06	8.21%	04	12.5%	10	9.52%
5.	Faecal Fistula	07	9.58%	04	12.5%	11	10.47%
6.	Residual Peritoneal Abscess	04	5.47%	05	15.6%	09	8.57%

Stomal and peri-stomal complications:

The most common stomal complication was stomal prolapse which was present in 16.43% cases followed by stomal retraction seen in 5.47% cases, stomal stenosis was present in 2.73% cases. Bleeding from stoma and stomal necrosis was not seen in any case of our study.

In peristomal complication skin excoriation was seen in 27.39% cases, peristomal dermatitis in 16.43% and peristomal hernia in 4.10% cases with ileostomy. (Table 2)

Table 2: Distribution Of Case According To Ileostomy Complication

S.No	Complication	No. Of Cases (N=73)	Percentage
A. Stomal Complications			
1.	Prolapse	12	16.43
2.	Retraction	04	5.47
3.	Stenosis	02	2.73
B. Peristomal Complications			
1.	Skin Excoriation	20	27.39%
2.	Peristomal Dermatitis	12	16.43%
3.	Peristomal Hernia	03	4.10%

Stoma creation and closure interval:

During follow-up, total 52 patients come for stoma closure with in period of our study. Amongst the 52 patients, in 46 patients stoma closure was done within 3 months -6 months of ileostomy creation. Only in 6 patients stoma closure was done after 6 months after surgery. In no patient stoma closure was done within 3 months after surgery.

Operative finding during ileostomy closure:

Interloop adhesion was seen in 17.39% of cases in whom closure was done within 6 months after surgery and in 33.33% of cases in whom ileostomy closure was done after 6 months of surgery. Fragility of gut was seen in 8.70% of cases in whom closure was done within 6 months after surgery and 16.66% of cases in whom ileostomy closure was done after 6 months of surgery.

Post-operative complication according to operative procedure:

In this study, wound infection was present in 61.11% of cases, wound dehiscence 44.44% of cases and respiratory complication in 50% of cases who underwent resection anastomosis with ileostomy.

Burst abdomen was observed in 12.50% of cases, septicaemia in 12.50% of cases and faecal fistula in 12.50% of cases. These complications were more common in patients in whom primary closure was done compared with those who underwent primary repair with ileostomy and resection anastomosis with ileostomy. Electrolyte imbalance was seen in 11.11% cases in whom primary repair with ileostomy was done and 9.25% cases in whom resection anastomosis with ileostomy was done. (Table 3)

Table 3: Postoperative Complications According To Operative Procedure

S. No	Complication	Primary Closure N=32	Primary Repair with Ileostomy N=54	Resection & Anastomosis with Ileostomy N=18	ITA N=1	Total
1.	Wound Infection	10(31.25%)	22(40.70%)	11(61.11%)	-	43
2.	Wound Dehiscence	07(21.87%)	09(16.66%)	08(44.44%)	-	24
3.	Residual Peritoneal Abscess	04(12.50%)	02(3.70%)	02(11.11%)	-	08
4.	Respiratory Complication (RI/PE/LA)	10(31.25%)	10(18.51%)	09(50%)		29
5.	Septicaemia	04(12.50%)	03(5.55%)	02(11.11%)	-	09
6.	Burst Abdomen	04(12.50%)	05(9.25%)	01(5.55%)		10
7.	Electrolyte Imbalance	-	06(11.11%)	02(11.11%)	-	10
8.	Lung Abscess	01(3.12%)	02(3.70%)	-	-	02
9.	Faecal Fistula	04(12.50%)	05(9.25%)	02(11.11%)		11

Post-operative hospital stay duration:

Irrespective of the type of surgical procedure, maximum number of patients was discharged from hospital after 10 days -15 days of hospital stay (61 patients).

Following primary closure of perforation site, 13 patients were discharged within 10 days -15 days of surgery, 09 patients were discharged in less than 10 days, 06 patients were discharged more than 20 days of hospital stay, whereas 04 patients were discharged after 15 days - 20 days of surgery. Average hospital stay duration was 14.06 days.

After primary repair with ileostomy, 32 patients were discharged on 10 days to 15 days of hospital stay, 08 patients were discharged within 10 days of hospital stay, 09 patients were discharged after 15 days to 20 days of hospital stay and 06 patients were discharged after 20 days of hospital stay. Average stay duration was 12.94 days.

After resection anastomosis with ileostomy, 09 patients were discharged after 10 days to 15 days of hospital stay, 04 patients were discharged within 10 days of hospital stay and 05 patients were discharged after 15 days to 20 days of hospital stay. Average duration of hospital stay was 12.29 days.

DISCUSSION

Incidence:

In the study conducted by Siddiqui FG et al^[4], Tripathi A et al^[6], Mittal S et al^[8] the predominant cause of ileal perforation was typhoid followed by tubercular aetiology and non -specific causes similar to our observation.

Age:

Tripathi A et al^[6], Mittal S et al^[8], Singh RK et al^[7], Rohit D et al^[10] had maximum number of cases in 20-40 years of age group, which was similar to our study.

Sex:

Tripathi A et al^[6], Mittal S et al^[8], Singh RK et al^[7], Rohit D et al^[10] studies had male preponderance similar to our observation. This is probably due to the fact that compared to women, more men work outdoors and are more prone to consume unhygienic food and water which is the main cause of typhoid infection and consequent perforation.

Socioeconomic status:

Agrawal P et al^[5] reported most of the patients in their study to be from poor farming villages (lower socioeconomic class) similar to our observation.

Presenting symptoms:

Verma H et al^[9], Rohit D et al^[10], Mittal S et al^[8] observed abdominal pain as the most common presenting symptom followed by vomiting and constipation in cases of ileal perforation peritonitis, similar to the present study.

Signs:

Verma H et al^[9], Rohit D et al^[10], Tripathi A et al^[6] reported abdominal tenderness, rigidity and guarding most common observed sign in the study subjects which was similar to the present study.

Widal reaction:

The studies by Tripathi A et al^[6], Verma H et al^[9], Rohit D et al^[10] on ileal perforation peritonitis reported a high proportion of positive Widal test affirming the fact that typhoid is the most common cause of non-traumatic ileal perforation peritonitis.

Gas under diaphragm:

Rohit D et al^[10], Tripathi A et al^[6], Verma H et al^[9] in all these similar studies, gas under diaphragm was observed in maximum number of patients suggestive of hollow viscus perforation. The absence of this finding in few patients could be due to adhesions around perforation, sealing of perforation and reabsorption of gases due to delayed presentation.

Number of perforations:

It was reported by Tripathi A et al^[6], Rohit D et al^[10], Siddiqui FG et al^[4] that maximum patients had single perforation comparable to our finding.

Agrawal P et al^[5] in their study observed multiple sites of ileal perforation in 60% cases and single perforation in 40% cases, which was different the other studies and our observation.

Site and size of perforation:

In the study by Rohit D et al^[10] maximum number of perforations were within 60 cm from I-C junction, about eighty percent of perforations were less than 1cm while the rest were 1.5 cm to 2.0 cm in diameter, similar to our finding.

Operative procedure:

In the study by Agrawal P et al^[5] ileostomy was done in 75.44% of cases and primary repair in the remaining 24.66% of cases.

In the study by Rohit D et al^[10] in all cases the perforation site was brought out as stoma.

Siddiqui FG et al^[4] reported that the patients were divided into two groups. In 57 patients out of a total of 108 patients, a proximal defunctioning ileostomy was fashioned. In the remaining 51 patients of 108 patients, primary repair or intestinal anastomosis was done without a defunctioning ileostomy.

Mittal S et al^[8] reported that the surgical management was done as primary repair in 30 patients (group A) and loop ileostomy in 30 patients (group B).

In the study by Tripathi A et al^[6] 50 patients of ileal perforation were included in the study. Patients were divided into two groups: Group A - Primary repair or resection anastomosis along with protective ileostomy. Group B - Only primary repair (Primary repair or resection anastomosis).

Duration of hospital stay:

According to the study by Mittal S et al^[8] the average duration of hospital stay of the patients in group I (primary repair) was 14.23 days

and in group II (loop ileostomy) was 10.7 days and 10.83 days for ileostomy closure.

As per the study by Tripathi A et al^[6] the mean hospital stay in group A (defunctioning ileostomy) patient is 12.64 days and those of group B (primary repair) was 23.76 days.

These studies had findings similar to our observation.

Singh RK et al^[7] reported average duration of hospital stay for primary closure as 12.54+ 4.91 days and for loop ileostomy as 17.02+ 5.00 days. In their study, hospital stay for loop ileostomy was greater than primary repair patients, which differed from our observation.

Postoperative complication:

In the study by Agrawal P et al^[5] postoperative respiratory problem is most common general complication which was observed in 43% cases. Wound infection was most common local complication which was seen in 85.96% cases, burst abdomen in 21% cases. Peristomal skin excoriation was most common peristomal complication which was seen in 38%.

Verma H et al^[9] in their study described various complications which were stomal discoloration (14.6%), peristomal skin excoriation (41.4%), wound sepsis (24.3%), intra-abdominal abscess (17%), and burst abdomen (4.8%). Three patients had post-operative septicemia and expired (7.3%) in their study.

In the study by Rohit D et al^[10] skin excoriation was the most common late complication observed in 26 patients (46.4%). Other complications were wound infection (33.9%), burst abdomen (5.4%) and incisional hernia (8.9%). Five patients had post-operative septicemia and expired (8.9%) in their study.

Siddiqui FG et al^[4] reported that wound infection was the most common local complication which was seen in 50 cases in group I and 14 cases in group II. Wound dehiscence, septicemia, intestinal obstruction and intra-abdominal abscess were other complications noted. Fecal fistula was the most dreaded complication in their study which developed in 6 out of the 51 (11.6%) patients in group II where no defunctioning ileostomy was done to protect the closure of perforation or end-to-end anastomosis. None of the Group I patients with a defunctioning ileostomy developed a fecal fistula. Ileostomy related complications such as skin excoriation (87.7%), ileostomy diarrhea (68.4%), ileostomy prolapse (10.5%) and ileostomy retraction (3.5%) were, they described, the main causes of morbidity and delayed hospital discharge in group I.

In the study by Mittal S et al^[8] wound infection was the most common postoperative complication, about 36.67% each in group I and group II, followed by wound dehiscence, intra-abdominal collections, systemic complication, and anastomotic leak. 8 cases out of 30 cases of ileal perforation treated with primary repair developed gross fecal contamination. Ileostomy related complications developed in 18 patients (60%) and closure related complications occurred in 7 patients (23.33%). Peristomal skin excoriation occurred in 33.33% of the patients which was the most frequently recognized early complication. It was followed by weight loss and retraction (13.33%), fluid and electrolyte imbalance (10%), and prolapsed (3.3%).

All the above study had observations comparable to the present study. Wound infection was the most common local complication, respiratory dysfunction the commonest general complication and peristomal skin excoriation the most prevalent ileostomy related complication.

CONCLUSION:

It was observed from the present study that patients in whom primary surgery with ileostomy was performed, suffered the most from wound infection. Whereas faecal fistula, which is considered to be the most dreaded complication, was least in patients with ileostomy compared to those in whom primary repair of perforation site was performed. Other post-operative complications like wound infection, wound dehiscence, burst abdomen, septicemia and respiratory complications were noted in patients irrespective of the type of surgery performed. Though ileostomy related complications lead to an increase in patient morbidity, the advantages of the procedure outweigh the specific complications. Moreover, ileostomy related complications can be

significantly reduced in patients by pre-operative patient education and counselling regarding stoma; proper fashioning of stoma intra-operatively and adequate post-operative stoma care. Therefore, we prefer temporary protective defunctioning ileostomy in patients with ileal perforation, especially in those with poor general condition and who have multiple perforations with unhealthy gut.

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