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Original Research Article

Comparative Evolution of Surgical Management of Enteric Perforation: Primary Closure and Loop Ileostomy

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Abstract

Background: Ileal perforation also a common surgical emergency especially in the tropical countries and in Indian subcontinent. It has been reported that ileal perforation is the fifth common cause of abdominal surgical emergencies due to high prevalence of tuberculosis and enteric fever.

Material & Methods: Forty patients who were admitted to Surgical Emergency with acute abdomen had been selected for the study. These patients were taken up for emergency surgery after proper written consent. Patients were divided in two groups after randomization as group A (primary repair) and group B (loop ileostomy). Postoperative complications in each group was observed during follow up and duly recorded.

Results: In the present study, Among the group A (primary repair) study participants, wound infection was seen in 7 patients, wound dehiscence occurred in 06 cases, systemic complications observed in 04 patients and intraabdominal collections found in 3 cases. Among the group B (loop ileostomy) study participants, wound infection was seen in 04 patients, wound dehiscence occurred in 02 cases, systemic complications observed in 03 patients and intraabdominal collections found in 2 cases. However, this distribution was statistically non-significant (P value >0.05). The average duration of hospital stay of cases undergone primary closure was 15.9 days compared to 20 days among cases who undergone ileostomy, which included ileostomy closure.

Conclusion: We concluded from the present study that the Ileostomy closure also decreases mortality as well as morbidity in patients. Ileostomy related complications may increase the postoperative stay but complications can be diminished by proper contrive of the stoma and issuance of appropriate nursing care of the stoma.

Keywords: primary closure, loop ileostomy, ileal perforation.

Introduction

In current scenario ileal perforation has an high incidence with a high mortality despite the availability of advanced diagnostic facilities and treatment

regimens [1]. On the other hand ileal perforation also a common surgical emergency especially in the tropical countries and in Indian subcontinent. It has been reported that ileal perforation is the fifth common cause of abdominal surgical emergencies due to high prevalence of tuberculosis and enteric fever [2]. Since ancient times gastrointestinal tract perforations had been surgical problem. Researchers had found evidences of gastrointestinal tract perforations in mummies. Perforation takes place when a disease was reach through the entire depth of the tract which ends with contamination of peritoneal cavity with gastrointestinal contents. It can be occurred anywhere from esophagus to the rectum [3].

It was also observed in numerous cases that the cause of ileal perforation was not familiar and these cases are known as nonspecific ileal perforation. The ileal perforation lastly results in seepage of gram-negative aerobic and anaerobic infection in peritoneal cavity leading to peritonitis [4]. There are numerous causes of ileal perforation which includes bacterial infections (ex.tuberculosis, salmonella and Yersinia) and viral infections (ex.cytomegalovirus and human immunodeficiency virus) and fungal infection (ex.histoplasma) and parasitic infections (ex. A.lumbricoides, E. histolytica and E. vermicularis) and drugs (ex.Nonsteroidal anti-inflammatory drugs) and others (Wagener's granulomatous) [5].

Though there is such a variety of operative procedures but still ileal perforation has a high rate of mortality [6]. There were miscellaneous operative procedures were recommended by different surgeons which are simple primary repair, repair with ileo-transverse colostomy, single layer repair with an omental patch and resection and anastomosis and lastly primary ileostomy [7]. The aim of the present study is to assess the outcome of primary repair in contrast to loop ileostomy in patients of ileal perforation and to find out the ideal procedure. The study will tend to establish the criteria according to presentation and severity of the disease.

Materials & Methods

The present comparative study was conducted in the Department of General Surgery. Forty patients who were admitted to Surgical Emergency with acute abdomen had been selected for the study. There was not any preoperative selection criterion. All the cases that were diagnosed as cases of perforation and peritonitis on the basis of laboratory investigations and clinical examination were selected for study and candidature for comparative study if laparotomic ally diagnosed as cases of ileal perforation. Institutional Ethics Committee Clearance was obtained before start of study and written and informed consent for the procedure was obtained from all the patients. Strict confidentiality was maintained with patient identity and data and not revealed, at any point of time.

Patients were divided in two groups after randomization as group A (primary repair) and group B (loop ileostomy). The antibiotics were given in both groups before surgery (ceftriaxone, ceftazidime and metronidazole). All operative procedures were done by group of experienced surgeons and the same technique was performed in all cases. Postoperative Complications in each group was observed during follow up and duly recorded. Data were entered in the MS office 2010 spread sheet and Epi Info v7. Data analysis was carried out using SPSS v22. Qualitative data was expressed as percentage (%) and Pearson's chi square test was used to find out statistical differences between the study groups and sensitivity, specificity, positive predictive value and negative predictive value were calculated. If the expected cell count was < 5 in more than 20% of the cells then Fisher's exact test was used. All tests were done at alpha (level significance) of 5%; means a significant association present if p

value was less than 0.05 and highly significant if p value less than 0.01.

Results

In the present study the we enrolled 40 Patients of ileal perforation after randomization of study participants. So that we can get equal comparable study participants. Total study participants were classified in two major groups according to the surgical procedure used. Patients were divided in two groups after randomization as group A (primary repair) and group B (loop ileostomy). Among the group A (primary repair) study participants, 06 (30%) patients were in the age group of 21-40 years, 12 (60%) cases were in the age group of 41-60 years and 2 (10%) patients were in the age group of 61-80 years. Among the group B (loop ileostomy) study participants, 06 (30%) patients were in the age group of 21-40 years, 11 (55%) cases were in the age group of 41-60 years and 3 (15%) patients were in the age group of 61-80 years. Among the group A (primary repair) study participants, 14 (70%) patients were male and 06 (30%) patients were female and among the group B (loop ileostomy) study participants, 15 (75%) patients were male and 05 (25%) patients were female. The mean value of BMI of the group A (primary repair) study participants was 26.45 ± 1.22 and mean value of BMI of the group B (loop ileostomy) study participants was 26.01 ± 1.46. However, this distribution was statistically non-significant (P value >0.05). (Table 1).

Table 1: Age distribution in both the groups.

Parameters		Group A	Group B	p value
Age (Years)	21-40	06 (3%)	06 (3%)	>0.05
	41-60	12 (60%)	11 (55%)	
	61- 80	2 (10%)	03 (15%)	
Gender	Male	14 (70%)	15 (75%)	>0.05
	Female	06 (30%)	05 (25%)	
BMI (Mean)		26.45 ± 1.22	26.01 ± 1.46	>0.05

In the present study, out of total study participants abdominal pain was the most common presenting symptom present in patients which was followed by abdominal distension, fever, vomiting and obstipation. Near about all patients (90%) presented within 72 hours of perforation and all cases were operated within 12 hours of adequate resuscitation. Fever was preceded all the abdominal symptoms in these patients and average duration of fever was 7 ± 3 days whereas in patients with typhoid enteric perforation, otherwise the average duration of fever was 9 ± 5 days.

Table 2: Distribution according to clinical presentation.

Presenting symptom	Number of patients
Abdominal pain	100 %
Fever	80%
Abdominal distension	84%
Vomiting	72%
Obstipation	70%
Trauma	10%

In the present study, Among the group A (primary repair) study participants, wound infection was seen in 7 patients, wound dehiscence occurred in 06 cases, systemic complications observed in 04 patients and intraabdominal collections found in 3

cases. Among the group B (loop ileostomy) study participants, wound infection was seen in 04 patients, wound dehiscence occurred in 02 cases, systemic complications observed in 03 patients and intraabdominal collections found in 2 cases. However, this distribution was statistically non-significant (P value >0.05). The average duration of hospital stay of cases undergone primary closure was 15.9 days compared to 20 days among cases who undergone ileostomy, which included ileostomy closure.

Table 3: Complications in primary repair and ileostomy closure.

	primary repair	ileostomy closure	P value
wound infection	07	4	>0.05
wound dehiscence	06	2	>0.05
systemic complications	04	3	>0.05
intra-abdominal collections	03	2	>0.05

Discussion

In present study we did the comparison between the outcome of primary repair versus loop ileostomy closure in cases of ileal perforation in terms of complications and to know the ideal procedure. In contrast to extensive research studies small bowel perforations most commonly affect the younger age group patients. In the present study the we enrolled 40 Patients of ileal perforation after randomization of study participants. So that we can get equal comparable study participants. Total study participants were classified in two major groups according to the surgical procedure used. Patients were divided in two groups after randomization as group A (primary repair) and group B (loop ileostomy). Among the group A (primary repair) study participants, 06 (30%) patients were in the age group of 21-40 years, 12 (60%) cases were in the age group of 41-60 years and 2 (10%) patients were in the age group of 61-80 years. Among the group B (loop ileostomy) study participants, 06 (30%) patients were in the age group of 21-40 years, 11 (55%) cases were in the age group of 41-60 years and 3 (15%) patients were in the age group of 61-80 years. Among the group A (primary repair) study participants, 14 (70%) patients were male and 06 (30%) patients were female and among the group B (loop ileostomy) study participants, 15 (75%) patients were male and 05 (25%) patients were female. The mean value of BMI of the group A (primary repair) study participants was 26.45 ± 1.22 and mean value of BMI of the group B (loop ileostomy) study participants was 26.01 ± 1.46. However, this distribution was statistically non-significant (P value >0.05). similar results also found in study done by Adesunkanmi et al, they reported a ratio of 4: 1 [8].

In the present study, out of total study participants abdominal pain was the most common presenting symptom present in patients which was followed by abdominal distension, fever, vomiting and obstipation. Near about all patients (90%) presented within 72 hours of perforation and all cases were operated within 12 hours of adequate resuscitation. Fever was preceded all the abdominal symptoms in these patients and average duration of fever was 7 ± 3 days whereas in patients with typhoid enteric perforation, otherwise the average duration of fever was 9 ± 5 days. similar results also found in study done by Talwar et al [9]. A study conducted by Wani et al reported that 62% cases of nontraumatic ileal perforation had enteric fever and only 26% of cases had nonspecific inflammation while rest cases had obstruction in 6%, tuberculosis in 4% and radiation enteritis in 1% patients [10].

In the present study, Among the group A (primary repair) study participants, wound infection was seen in 7 patients, wound

dehiscence occurred in 06 cases, systemic complications observed in 04 patients and intraabdominal collections found in 3 cases. Among the group B (loop ileostomy) study participants, wound infection was seen in 04 patients, wound dehiscence occurred in 02 cases, systemic complications observed in 03 patients and intraabdominal collections found in 2 cases. However, this distribution was statistically non-significant (P value >0.05). The average duration of hospital stay of cases undergone primary closure was 15.9 days compared to 20 days among cases who undergone ileostomy, which included ileostomy closure. The morbidity was found lower in patients who underwent ileostomy closure as compared to patients who had primary repair in present study. There was no mortality recorded in present study compared to 28% in other studies [11]. A study conducted by Bakx et al observed nearly similar results compared to present study in relation to ileostomy related complication in patients with ileal perforation [12,13].

Conclusion

We concluded from the present study that the Ileostomy closure also decreases mortality as well as morbidity in patients. Ileostomy related complications may increase the postoperative stay but complications can be diminished by proper contrive of the stoma and issuance of appropriate nursing care of the stoma. It should be concluded that loop ileostomy in these cases is only temporary and lifesaving advantages over longer hospital stay.

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