

**COMPARATIVE ANALYSIS OF PRIMARY CLOSURE AND LOOP ILEOSTOMY:  
THE SURGICAL MANAGEMENT OF ENTERIC PERFORATION**

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**ABSTRACT**

**Background:** In current scenario ileal perforation has a high incidence with a high mortality despite the availability of advanced diagnostic facilities and treatment regimes. **Material & Methods:** Fifty 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:** Typhoid remains the major cause of ileal perforation (36%) and tubercular perforation found in 28% of cases, nonspecific cause in 32% of patient and traumatic in 4% of patients. Among all patients wound infection was the most common complication (40%). Peristomal skin excoriation occurred in 8 patients (32%), weight loss in 3 (12%), retraction in 3 (12%), fluid and electrolyte imbalance in 2 (8%) and prolapse was seen in only 1 patient (4%). Complications related to Ileostomy closure occurred in 4 patients (16%), wound infection in 7 (28%), anastomotic leak in 2 (8%), intraabdominal collections in 2 (8%) and wound dehiscence in 3 patients (12%). **Conclusion:** We concluded that defunctioning loop ileostomy closure should be preferred over primary repair in cases of ileal perforations in present study. It should be concluded that loop ileostomy in these cases is only temporary and lifesaving advantages over longer hospital stay.

**Key words:** primary closure, loop ileostomy, ileal perforation. Nausea and vomiting.

**INTRODUCTION**

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 (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). In current scenario ileal perforation has an high incidence with a high mortality despite the availability of advanced diagnostic facilities and treatment regimens(3). There are numerous causes of ileal perforation which includes bacterial infections (ex. tuberculosis, salmonella and Yersinia) and

viral infections (ex.cytomegalo virus and human immunodeficiency virus) and fungal infection (ex.histoplasma) and parasitic infections (ex. A.lumbricoides, E. histolytica and E.vermicularis) and drugs (ex.Nonsteroidalanti-inflammatory drugs) and others(Wagener's granulomatous)(4). 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 (5).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 anatomises and lastly primary ileostomy(6).Though there is such a variety of operative procedures but still ileal perforation has a high rate of mortality. 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 thecriteria according to presentation and severity of the disease.

## **MATERIALS & METHODS**

The present comparative study was conducted in the Department of General Surgery. Fifty 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 laparotomically diagnosed as cases of ileal perforation. 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). 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. The data were analyzed using MS Excel 2010, Epi Info v7 and SPSS v22.

## **RESULTS**

Total of fifty patients were studied in present study. Among all cases pain abdomen was the most common presenting symptom which was present in all cases rest were fever, abdominal distension and vomiting (Figure 1). Time since perforation was with in 12 hour in 2 cases, between 12 and 24 hour in 25 cases, between 24 and 48 hour in 12 cases, 48 and 72 hour in 6 cases, between 72 and 96 hour in 4 cases, and between 96 and 120 hour in 1 case. 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  $7 \pm 2$  days whereas in patients with typhoid enteric perforation, otherwise the average duration of fever was  $10 \pm 7$  days. According to the etiology of perforation it was found that circular perforation of typhoid at antimesenteric border was seen in 36% of cases, non specific type seen in 32% of cases, tubercular elliptical perforation at antimesenteric border was seen in 28% cases and traumatic type seen in only 4% of cases.

In all the cases biopsy was done for histopathological examination. Among all patients wound infection was the most common

complication (40%). Among patients who undergone ileostomy Peristomal skin excoriation was the commonest complication which occurred in 8 patients (32%) which was followed by weight loss in 3 (12%) and retraction in 3 (12%) and then fluid and electrolyte imbalance observed in 2 patients (8%) and prolapse was seen in only 1 patient (4%).

Complications related to Ileostomy closure occurred in 4 patients (16%), wound infection was seen in 7 patients (28%), anastomotic leak occurred in 2 cases (8%), intraabdominal collections found in 2 cases (8%), wound dehiscence was seen in 3 (12%), and reoperations done in 2 cases (8%) (Figure 2). The difference of complications between the two groups was statistically significant (*P* value 0.037).

The average duration of hospital stay of cases undergone primary closure was 15.4 days compared to 20.62 days among cases who undergone ileostomy, which included ileostomy closure. The average duration of ileostomy before closure was 204 days. Only one patients having diabetes mellitus in present study and outcome of the patient was good and remaining 49 patients were having no comorbidities.

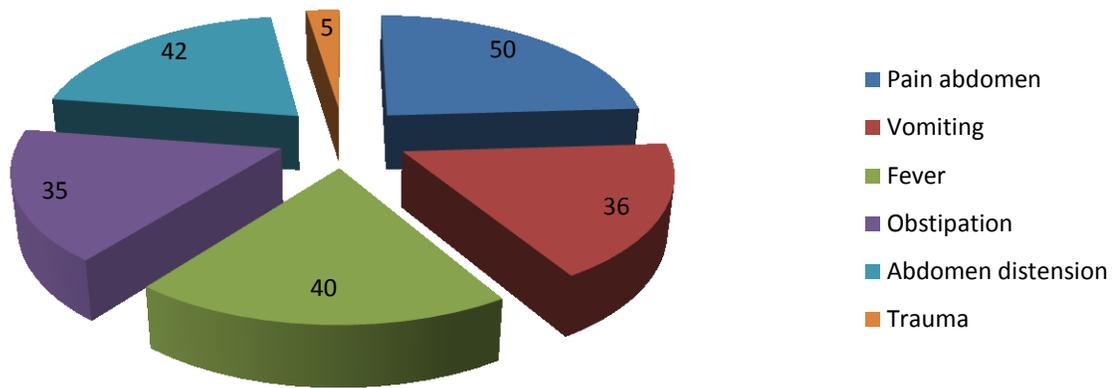
## DISCUSSION

In present study we did the comparison between the outcome of primary repair versus loopileostomy 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.

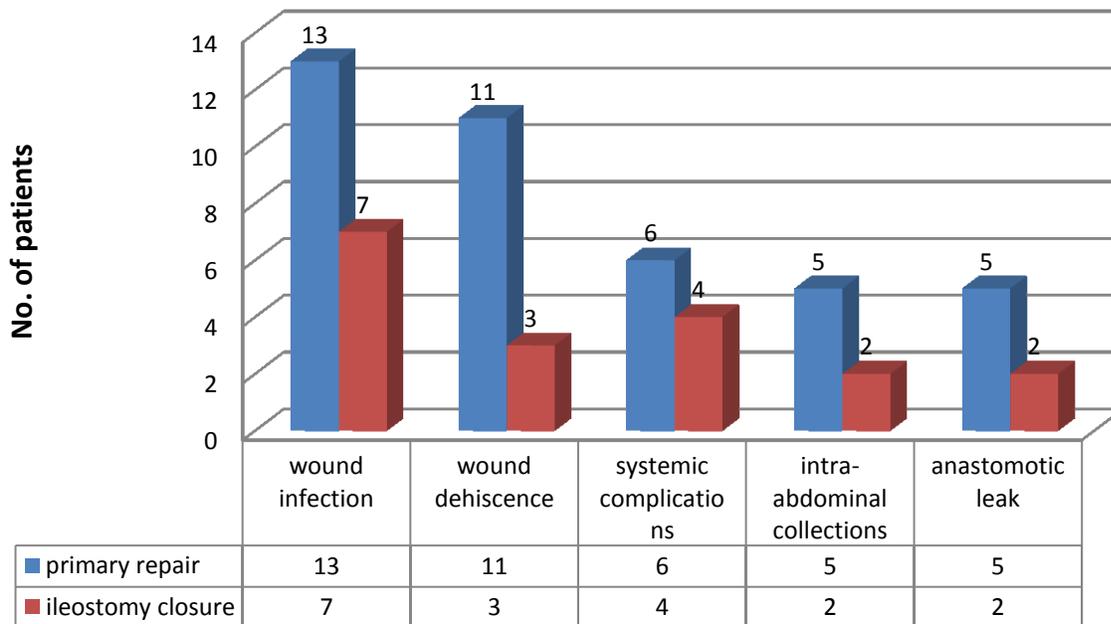
**Table No.-1: Age distribution in both the groups.**

Age group (in years)	Group A		Group B	
	Number of cases	% age	Number of cases	% age
10-20	1	4	2	8
21-30	6	24	7	28
31-40	9	36	6	24
41-50	3	12	6	24
51-60	4	16	4	16
61-70	2	8	0	0
<b>Total</b>	<b>25</b>	<b>100</b>	<b>25</b>	<b>100</b>

**Fig No.-1: Clinical presentation in study group.**



**Fig No.-1: Complications in primary repair and ileostomy closure.**



In the present study male were found more than female and the male to female ratio of 6: 1 which was higher than male female ratio found in a study conducted by Wani et al, they reported a ratio of 3: 1(7), similar results also found in study done by Adesunkanmi et al, they reported a ratio of 4: 1 (8)and almost similar results found by Talwar et al (9). On the other hand male female ratio of 6.4: 1 and 6.5: 1 found in two

respective studies conducted by by Beniwal et al (10)and Prasad et al (11).

The mean age was 34.65 years with range of 14–68. Majority of patients were in the age group 21–40 years (56%).The study gives panorama of the present-time causes of non-traumatic ilealperforation on the basis of Widal test, histopathological findings and laparotomy findings.

In present study typhoid remains the major cause of ileal perforation (36%) and tubercular perforation found in 28% of cases. On the other hand there was nonspecific cause in 32% of patients. Traumatic ileal perforation was observed in 4% of patients. 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(7). An another study conducted by Nadkarniet al found that 56.6% patients had nonspecific cause of ileal perforation followed by typhoid in 25% of patients and rest had tubercular perforation in 9.3% of cases(12).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(13). However mortalities were multifactorial and unrelated to type of operative procedure. Wound infection was the most common postoperative complication found in both groups in present study which was followed by wound dehiscence, systemic complication, intra-abdominal collections and anastomotic leak. This difference in complications between these two groups was statistically significant with *P* value of 0.034. These results similar to findings obtained in previous studies (*P* value < 0.05)(8).The other complications observed in group II were directly related to ileostomy which hampered the quality of life and notably increase the morbidity among these patients. Ileostomy related complications occurred in 12 patients (48%) and closure related complications occurred in 4 patients (16%). 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(14). Peristomal

skin excoriation found in 8 patients (32%) and this was the most commonly observed and early complication. It was followed by weight loss in 3 (12%) and retraction in 3 (12%) and then fluid and electrolyte imbalance observed in 2 patients (8%) and prolapse was seen in only 1 patient (4%).The average duration of hospital stay in group I cases who undergone primary closure was 15.4 days compared to 20.62 days among group II cases who undergone ileostomy, which includes 10.24 days of ileostomy closure. The average duration of ileostomy before closure was 204 days. Hence, the hospital stay was slightly longer in case of ileostomy closure (20.62 days) but present study also highlights the life-saving facts of salvage loop ileostomy closure over primary repair in the cases of ileal perforation. The research scholars recommend that whenever in cases of intestinal perforation the leakage is suspected in the postoperative period than urgent exploratory laparotomy must done to control peritoneal contamination by exteriorizing the area of ileal or intestinal leak as a loop ileostomy. It is very difficult to make a verdict, whether ileostomy closure is better than primary repair of ileal perforation because of small sample size of our study and very small incidence of these complications. Therefore further studies with big sample size will be needed to enlighten the facts. However for a single ileal perforation, primary closure may be considered as operative procedure if volume of peritoneal contaminant is low.

## CONCLUSION

Temporary defunctioning loop ileostomy closure in patients of ileal perforation enacts an important role in decreasing the prevalence of complications eg. Fecal fistula. Ileostomy closure also decreases mortality as well as morbidity in patients. Ileostomy related complications may increase the

postoperativestay but complications can be diminished by proper contrive of the stoma and issuance of appropriate nursing care of the stoma. We concluded that defunctioning loop ileostomy closure should be preferred over primary repair in cases of ileal perforations in present study. It should be concluded that loop ileostomy in these cases is only temporary and lifesaving advantages over longer hospital stay.

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