International Surgery Journal
Agrawal P et al. Int Surg J. 2023 Feb;10(2):249-252
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: https://dx.doi.org/10.18203/2349-2902.isj20230262

Original Research Article

A comparative study between the outcomes of various surgical procedure in management of ileal perforation of tertiary care in central India

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Received: 05 November 2022
Accepted: 07 January 2023

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ABSTRACT

Background: This study was done to establish the outcomes of surgical procedure in management of ileal perforation.
Methods: This study included 70 patients admitted to surgical emergency with acute abdomen. These patients were divided into 3 groups group A, group B, group C. The surgical management was done as primary repair (group A) and resection and anastomosis (group B) and primary repair with ileostomy (group C); Comparative study was done between all procedure. Study centre was L. N. medical college and hospital and research centre, Bhopal, Madhya Pradesh. Study duration was from March 2021 to September 2022.
Results: This study highlights the life-saving role of loop ileostomy for postoperative intestinal leakage in cases of primary repair of perforation. It is recommended that whenever intestinal leakage is suspected in the postoperative period, urgent exploratory laparotomy must be undertaken and the continuing peritoneal contamination should be controlled by exteriorizing the site of intestinal leak as loop ileostomy.
Conclusions: In our study we have found that, for a single perforation, primary repair is the procedure of choice and for multiple perforation with good systemic support, resection anastomosis is procedure of choice. For patient with poor systemic support, loop ileostomy is preferred procedure as it decreases the mortality.

Keywords: Ileal perforation, Ileostomy, Perforation peritonitis, Resection anastomosis

INTRODUCTION

Since the beginning of time, surgical problems involving intestinal perforations have existed. The clinical criterion for perforation is any pathological condition or disease "penetrating the whole thickness of any hollow viscus, thereby resulting in the contamination of peritoneal fluid with intraluminal contents". Complete length of gastrointestinal tract from the oesophagus to the rectum, is susceptible to perforation.[1] There are several clinical, laboratory, and radiological methods to detect perforation in a patient. For example, on the chest radiograph, patients typically have free air evident under diaphragm, and upon examination, they show localised peritoneal symptoms. Patients with diffuse peritonitis have more extensive leakage and evidence of widespread peritonitis on abdominal examination. A tiny percentage of patients have spontaneous closure or resolution of perforation on their own, but in most instances, surgery is necessary. Perforation has the highest death rate for any ulcer disease, nearing 15%. Perforation is a surgical condition, and conservative therapy necessitates immediate surgical surgery.

In underdeveloped nations, ileal perforation peritonitis is a common surgical emergency that has to be treated. The most prevalent cause of this terrible consequence is typhoid fever, followed closely by TB, trauma, and nonspecific enteritis.[2] It has been noted that the incidence

of perforation in typhoid fever might range anywhere from 0.8% to 18%.[3] It is estimated that between 5 and 9 percent of all small intestinal perforations in India are caused by tuberculosis, making it the second most prevalent cause after typhoid fever.4 In underdeveloped nations, typhoid fever continues to be a serious issue, most frequently in regions with polluted water sources and insufficient waste management. Typhoid intestinal perforation mortality rates have been reported to range from 5% to 62%, and in patients who appear late, they might exceed 80%. As a result, managing these patients requires sophisticated decision-making and may be challenging. However, the etiology for perforation are completely different in Western countries. These include inflammatory bowel disease, familial adenomatous polyposis, colorectal cancer, pelvic sepsis, trauma, diverticulitis, fistula, ischemic bowel disease, radiation enteritis, faecal incontinence, and paraplegia.

Ileostomy is frequently a necessary lifesaving procedure in the event that a patient has perforation peritonitis. Resuscitation and then laparotomy are the two procedures that are typically used as the standard source control measures for secondary peritonitis caused by hollow viscus perforation. Depending on the location and number of holes, as well as the degree of peritonitis and the overall health of the patient, the various techniques of source management for ileal perforations include primary closure, resection, and anastomosis of tiny gut or diverting stoma. After that, antibiotics and ongoing postoperative care are provided to the patient as part of the management process. Ileostomy is performed for the purposes of decompression, exteriorization, and diversion of the bile duct. It has been discovered that primary ileostomy is superior to other surgical procedures in terms of the morbidity and mortality rates. This is especially true in patients who are near death and who present late in the course of their illness.[6] These are the kinds of patients that most frequently present themselves at our surgical emergency care facilities in India. Even while performing an ileostomy can save a patient's life in certain circumstances, the treatment has the potential to cause a considerable number of problems. The issues that might arise after having an ileostomy include bleeding, ischemia, blockage, prolapse, retraction, stenosis, fistula development, residual abscess, wound infection, and incisional hernia. In addition, it is well knowledge that having an ileostomy can have a negative impact on one's quality of life as a result of the physical and mental challenges it presents.

Different researchers propose different surgical techniques, including the following: Simple primary repair of perforation; repair of perforation with ileo-transverse colostomy; primary ileostomy; single layer repair of perforation with an omental patch; resection and anastomosis and primary ileostomy. The primary objective of the present study was to assess the effectiveness of various surgical procedures, as well as their side effects and mortality, in the treatment of gastrointestinal perforation at our institute. The results of the patient's surgical treatment and the presentation, severity, and management criteria for gastrointestinal perforation will all be influenced by the findings of this study.

METHODS

This comparative cross-sectional study was conducted in the department of general surgery, L. N. medical college and J. K. hospital, Bhopal. A total of 70 patients admitted to surgical emergency with acute abdomen were selected for the study. There were not any preoperative selection criteria; the cases which were proven to be cases of perforation peritonitis on the basis of investigations and clinical examination were enrolled in the present study. These patients were taken up for emergency surgery after resuscitation, and an informed consent was taken. The antibiotics were given in all groups after admission to hospital and before surgery with 3rdgeneration cephalosporin (cefotaxime, ceftazidime, ceftriaxone, etc.) and metronidazole. These patients were divided into 3 groups-group A, group B, group C. The surgical management was done as primary repair (groupA) and resection and anastomosis (groupB) and primary repair with ileostomy (group C); comparative study was done between all procedure.

All operations were done by group of experienced surgeons in our institute. All the procedures were performed in the same technique respectively. Postoperative complications in each group like wound infection, wound dehiscence, intraabdomina labscess, stricture of anastomosis site, faecal fistula, peritonitis, septicemia, ileostomy related complications, paralytic ileus, intestinal obstruction and death and so for there evaluated. Study centre L. N. medical college and hospital and research centre, Bhopal, Madhya Pradesh. Study duration was from March 2021 to September 2022. Approval was obtained from the institutional ethical committee (LNMC and RC/DEAN/2021/ETHICS/266).

The data obtained was subjected statically analysis with the consult of the statistician. The data so obtained was compiled systemically. A Master table was prepared and total data was subdivided and distributed meaningfully and presented as individual tables and graphs. Statistical test employed in this study include: Chi square test, students t test, Pearson correlation test and univariate analysis using linear regression.

RESULTS

Age distribution

During the 24-month period of study, a total of 70 patients with perforation were enrolled in the present study. Perforations were most commonly perforation observed in third and fifth decade of life with males more commonly affected (Male: Female: 2.5:1). Pain abdomen

was most common clinical presentation (100%) followed by obstipation, fever, abdominal distension and vomiting.

Table 1: Age distribution of participants, (n=70).

Age (Years)	N	Percentage (%)
0-10	1	1.42
11-20	2	2.85
21-30	31	44.28
31-40	7	10
41-50	18	25.71
51-60	6	8.57
61-70	1	1.42
71-80	4	5.71

Table 2: Timing of presentation of cases, (n=70).

Time (Hour)	N	Percentage (%)
Within 12	34	48.57
13-24	20	28.57
25-48	14	20
48-72	2	2.85
72-96	0	-

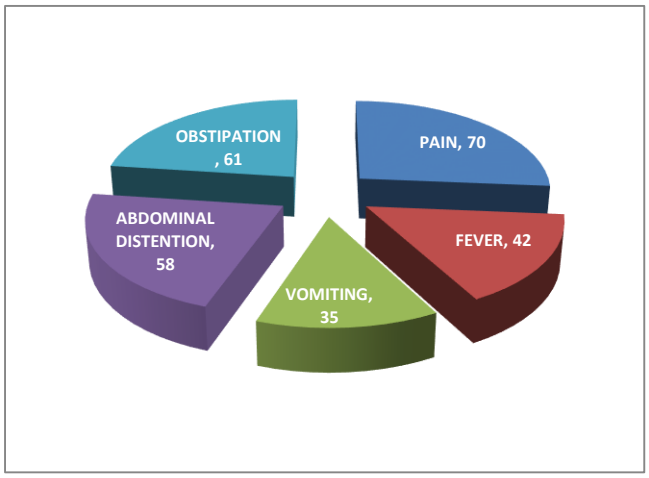

Figure 1: Clinical presentation.

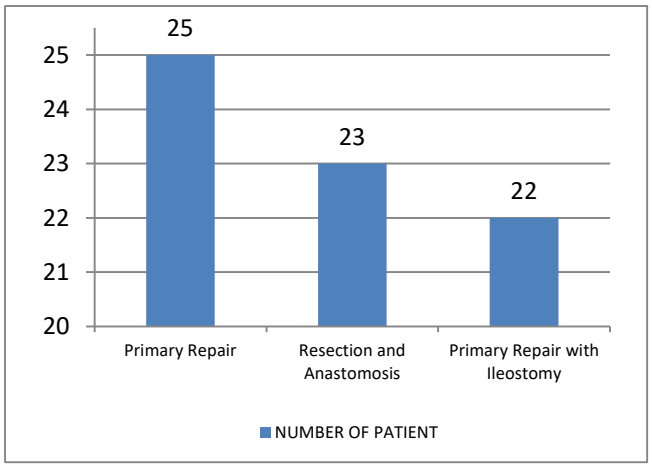

Figure 2: Operative procedure.

Table 3: Complication among participants, (n=70).

Complications	Group A, (n=25) (%)	Group B, (n=23) (%)	Group C, (n=22) (%)
Wound infection	9 (36)	11 (47.9)	12 (48)
Intraabdominal collection	3 (12)	8 (34.78)	10 (45.45)
Anastomotic leak	1 (4)	2 (8.6)	10 (45.45)
Wound dehiscence	1 (4)	2 (8.6)	12 (48)
Systemic complication	1 (4)	2 (8.6)	5 (22.72)
Total	15	25	49
Mortality	3 (12)	5 (21.7)	4 (18.2)

DISCUSSION

Ileal perforation is considered to be a surgical emergency in India as well as in other tropical nations. According to some reports, it is the sixth most prevalent cause of abdominal crises that can be attributed to a variety of factors. This illness has a sudden start, a quick downward trend, and a high fatality rate if it is not treated, despite the fact that contemporary diagnostic facilities and breakthroughs in treatment regimes are available. The start of symptoms as well as the moment at which the patient presents themselves in the hospital are the two most critical prognostic factors. A positive prognosis is nearly always associated with an early presentation, while a late presentation is associated with a negative prognosis due to the fact that it can progress to septicemia and multiple organ failure, particularly in poor nations.

In this study, we evaluated the outcome, complications and fatalities associated with of three different surgical treatments for ileal perforation. In the current study, a male preponderance was found with a male to female ratio of 2.5:1, which is on the lower side of the ratios 3:1 reported by Wani et al 4:1 reported by Adesunkanmi et al and Talwaretal and 6.4:1 reported by Beniwal et al.[5-8] The majority of patients (44.2%) were in the age range of 21 to 30 years old followed by the fifth decade. Based on the Widal reaction, operational results, and histological analysis, this study sheds light on the modern causes of non-traumatic perforation of the small intestine in this region of the world. The most common recognized cause of small bowel perforation (40%) is still typhoid fever, and the second most common cause is tuberculous perforation (25%). Histopathological examination indicated nonspecific inflammation in a significant number of instances (35%), however, investigators and pathologist were unable to determine the exact underlying aetiology of the condition. In five percent of patients, the ileal perforation was revealed to have been caused by trauma. According to Wani et al findings the causes of non-traumatic ileal perforation were enteric fever (62% of cases), nonspecific inflammation (26% of

cases), blockage (6% of cases), TB (4% of cases), and radiation enteritis (1% of cases).[5] According to the research done by Nadkarni et al 56.6% of the cases were caused by nonspecific factors, followed by typhoid perforation (25%) and tubercular perforation (9.3%).[9]

In the patients in our research who received ileostomy, the rate of morbidity was significantly greater than the rate of morbidity in the patients who underwent resection anastomosis and primary repair. Collectively, the participants in the present study had a fatality rate of 1.7%, whereas previous studies found that mortality rates were 28.0%. However, there was no correlation between the type of procedure and mortality ($p>0.05$). The most frequent postoperative complication was an infection of the wound, followed by wound dehiscence, intra-abdominal collections, systemic complication, and anastomotic leak. The differences in the incidence of complications between the three groups were found to be statistically significant ($p=0.046$), consistent with the findings of earlier studied.[8,9] Other issues that occurred in group II were due to ileostomy, which negatively impacted the patients' quality of life and considerably increased their risk of morbidity.

This study also sheds insight on the potentially life-saving significance of loop ileostomy in the treatment of postoperative intestinal leakage in patients undergoing primary repair of perforation. It is recommended that whenever there is a suspicion of intestinal leakage in the postoperative period, an urgent exploratory laparotomy should be performed, and the continuing peritoneal contamination should be controlled by exteriorizing the site of intestinal leakage as a loop ileostomy. This is because intestinal leakage can cause peritoneal contamination. According to the findings of our research, the treatment of choice for treating a single hole is known as primary repair, whereas the procedure of choice for treating numerous perforations that have strong systemic support is known as resection anastomosis. Because it reduces the risk of death, the loop ileostomy is the surgery of choice for patients who have inadequate systemic support.

Peritonitis caused by perforation of a hollow viscus is a typical occurrence in surgical practice. In underdeveloped nations, spontaneous ileal perforation remains a difficult surgical problem. In addition to typhoid fever, other causes of nontraumatic ileal perforation include TB, nonspecific inflammation, blockage, radiation enteritis, and Crohn's disease. Even though surgery is acknowledged as the definitive therapy, the choice of surgical technique remains debatable. The majority of studies describe simple perforation closure or resection and anastomosis as the preferred technique. Even while these methods seem tempting, they are not without difficulties, particularly in emergency situations. Ileostomy is a lifesaving surgery, especially in situations with fulminant enteritis and prolonged widespread peritonitis. In such instances, several operating procedure selection criteria might be derived from preoperative variables and intraoperative observations.

CONCLUSION

The sample size for the study was less in comparison to other case series reporting the outcome of treatment modalities for perforation peritonitis.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Agrawal P, Anand K, Khare R, Sahu A. A comparative study between the outcomes of various surgical procedure in management of ileal perforation of tertiary care in central India. Int Surg J 2023;10:249-52.