



NON-TRAUMATIC ILEAL PERFORATION: EPIDEMIOLOGY, MANAGEMENT & OUTCOMES

Surgery

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ABSTRACT

Introduction: Ileal perforation is fifth common cause of abdominal emergencies in the India. Patients present with peritonitis and septicemia. The recent surgical advancements has improved the outcomes.

Methodology: It is a retrospective study carried out in a surgical unit of SSH, IMS. All non-traumatic ileal perforation from 2017 to 2019 were evaluated.

Results: 31 patients were admitted from January 2017 to December 2019. Most are 20-40 year males, with 2 days of pain abdomen. On laparotomy 78% had 500-2000ml contamination, while 68% had single ileal perforation, typhoid was most common aetiology. Three had primary closure of perforation rest underwent either exteriorization of perforation as ileostomy or diversion loop ileostomy or resection with end ileostomy. None developed complication like ECF. Overall mortality rate is 25%.

Summary: Defunctioning loop ileostomy decreases complication like fecal fistula, but in single pinpoint perforation with minimal contamination primary closure is found to be safe.

KEYWORDS

Ileal perforation, Typhoid, Ileostomy, Fistula

INTRODUCTION:

Perforation of bowel is one of the common surgical emergencies encountered in our surgical emergency department. Perforation is likely to occur when the inciting pathology extends through the full thickness of the bowel. Perforation leads to spillage of intraluminal contents into the abdominal cavity leading to peritonitis. F. M. Nadkarni et al⁽¹⁾ cited that any segment of gastrointestinal tract from oesophagus to the rectum can perforate. Mittal S⁽²⁾ cited that ileal perforation is fifth common cause of abdominal emergencies in the Indian subcontinent and tropical countries as enteric fever and tuberculosis are rampant in these regions. Patients usually present with peritonitis and septicemia, depending upon the duration and severity of illness. Bosscha K⁽³⁾ concludes that the advancements in surgical technique and antimicrobial therapy along with availability of intensive care support has improved the outcome in patients with peritonitis.

METHODS:

It is a retrospective study carried out in a single surgical unit of Sir Sunderlal Hospital, Institute of Medical Sciences. All the patients of non-traumatic ileal perforation from 2017 to 2019 were evaluated.

RESULTS:

Total 31 patients were admitted from January 2017 to December 2019. Male preponderance was identified with 23 of them being males and rest of the eight were females. Majority (15 patients) belonged to the age group of 20 to 40 years, followed by eight patients who were less than 20 years old, with seven patients in the age group of 40 to 60 years and one patient aged > 60 years [Table No.1]. Pain abdomen was the most common complaint. Only 4 patients presented within 2 days of onset of illness, while 26 patients presented after 2 days but within a week and seven patients presented one week after developing illness.

All patients underwent X ray abdomen in erect posture, ultrasound of abdomen and complete blood count, RFT and LFT. Haemoglobin was less than 10 gm% in 16 patients and rest of the 15 patients had greater than 10 gm%.

Table 1 Pre-Operative Data

Age (Yrs)	Number of Patients	
	n	%
0-20	8	26
20-40	15	48
40-60	7	23
>60	1	3
Symptoms	Number of Patients	
	n	%
Pain abdomen	31	100
Distension	26	83
Fever	21	68
Obstipation	18	58

After the diagnosis of perforation peritonitis was established, all patients underwent laparotomy. 6 patients had around 500ml of peritoneal contamination, majority (24 patients) had 500ml to 2000ml of contamination, one patient had greater than two litres of contamination. It was also found that contamination was less in patients those who presented early. The nature of contamination was Reactionary fluid in six subjects, purulent and feculent in 13 and 12 patients respectively. Single ileal perforation was identified in 21 cases; two sites of perforation were seen in 7 patients, whereas rest of the three patients had multiple sites of perforations. The site of perforation was within two feet proximal to ICR in 23 patients, in eight cases it was more than two feet proximal to ICR [Table No.2]. In all the cases of perforations that are greater than 2 feet proximal to ICR the aetiology was either tuberculosis, malignancy or other non-specific causes but not typhoid.

Table 2 Intra operative data

Contamination (in ml)	Number of Patients	
	n	%
<500	6	19
500 – 2000	24	78
>2000	1	3

Nature of Contamination	Number of Patients	
	n	%
Reactionary	6	19
Purulent	13	42
Feculent	12	39
Number of Perforations	Number of Patients	
	n	%
Single	21	68
Two	7	22
Multiple (>2)	3	10
Etiology	Number of Patients	
	n	%
Typhoid	18	58
Tuberculosis	7	23
Malignancy	2	6
Non-Specific	4	13

All the patients with multiple perforation underwent resection of the perforated ileal segment with end ileostomy. Of the seven patients with two perforation sites, five patients underwent primary closure of the distal perforation with exteriorization of the proximal ileal perforation as loop ileostomy. Rest of the two patients underwent resection with end ileostomy as the adjacent bowel was not healthy. Of the 21 patients with single ileal perforation three had pin point perforation with minimal contamination and primary closure alone was done in them, in six patients primary closure of the perforation was done along with proximal defunctioning loop ileostomy, in ten patients the perforation site was exteriorized as loop ileostomy and in the remaining three patients resection of the segment with end ileostomy was done [Table No 3]. Resection in patients with single or two perforation sites was done mainly because of the associated gangrene, stricture or malignancy.

Table 3 Operative procedure done

Surgical Procedure	Number of Patients	
	n	%
Exteriorization	10	32
Primary Closure	3	10
Primary Closure with loop ileostomy	6	19
Primary Closure of distal perforation with exteriorization of proximal perforation as loop ileostomy (in those with 2 perforation sites)	5	16
Resection of diseased segment with end ileostomy	7	23

The aetiology of perforation was Typhoid in 18 cases, Tuberculosis in seven subjects , malignancy in two patients and was not specific in rest of the four cases.

Of the 31 patients operated, 3 patients died in the immediate post-operative period (< 48 hrs), one patient died in early post-operative period (2 to 7 days), four died in the late post-operative period (> 1 week). MODS was leading cause of death followed by AKI and ARDS. 11 patients developed surgical site infection and three patients had burst abdomen [Table No 4]. Duration of hospital stay was < one week in eight patients, one to two weeks in 14 patients and > 2 weeks in one patient.

Table 4 Post-operative data

Complication	Number of Patients	
	n	%
SSI	11	35
Burst Abdomen	3	10
None	9	29
Mortality	8	26
Stoma Related	0	0
Duration of Hospital stay	Number of Patients	
	n	%
<1 week	8	35
1-2 week	14	61
>2 week	1	4

Discussion: In our study, male preponderance was seen in the incidence of the non- traumatic ileal perforation which is consistent with other studies. Male to female ratio is 2.9 : 1 which is consistent with a study by RA Wani et al⁽⁴⁾ which reported a 3:1 ratio. The

incidence was found to be higher in third and fourth decades of the life and this is found to be consistent with G. Singh et al⁽⁵⁾ and Mittal S et al⁽²⁾. In Misha Anam et al⁽⁶⁾ they found that males in their third and fourth decades of life are more likely to stay away from homes under suboptimal conditions and dining out and are more likely to be prone to infections like typhoid and tuberculosis, the leading causes of non-traumatic ileal perforations. Khan M⁽⁷⁾ cited that the gender-linked differences in the host inflammatory response induced by *S. typhi* at Peyer's patches may also be responsible for male predominance . All patients presented with complaints of pain abdomen and fever, it is consistent with observations made by Abdul Ghaffar Ansari et al⁽⁸⁾ and most patients presented in the second week of the illness.

Intraoperative feculent peritonitis was seen in 12 patients amounting to 39% which is similar to previous studies by Dr J.Ramanaiah et al⁽⁹⁾. 68% cases had single ileal perforation and 22% had perforation at two sites and rest of 10% had multiple perforation and these outcomes are consistent with previous studies by Dr J.Ramanaiah et al⁽⁹⁾ and Edino ST et al⁽¹⁰⁾.

Study done by Azad Patel et al⁽¹¹⁾ consider primary repair as the procedure of choice for single perforations but in the presence of severe abdominal contamination, exteriorisation of the perforated segment was the preferred treatment modality. Arshad et al⁽¹²⁾ pointed out that complications like wound infection, residual abscess and faecal fistula are more frequent with primary closure. This study also promotes primary ileostomy as the surgical procedure of choice in ileal perforation. We are also of the opinion that in presence of a history of protracted illness, delayed admission to hospital and a lack of body reserve in most of our patients, it is safer to form a temporary stoma which buys us time to build up the patient and tide over the emergent situation. Singh et al⁽¹³⁾ concluded that out of 42 patients undergoing surgery for typhoid perforation, that none of the patients undergoing temporary ileostomy developed a postoperative enterocutaneous fistula whereas 5 patients developed this complication after primary closure of the perforation. Faisal et al⁽¹⁴⁾ also recommends temporary defunctioning ileostomy as the incidence of complications like faecal fistula is low and it reduces mortality in patients undergoing surgery for ileal perforations. However Azad Patel et al⁽¹¹⁾ showed that in multiple perforation or in the presence of associated gangrene, intestinal resection with anastomosis is indicated but this will prolong anaesthesia time and outcomes are poor and also resection and anastomosis was significantly associated with increased number of complications. In our study out of 21 patients with single ileal perforation three had pinpoint perforation with minimal contamination and they underwent primary closure rest of the 19 patients i.e., 90% underwent either primary closure of perforation along with defunctioning loop ileostomy or exteriorization of perforation as loop ileostomy. And in those with two perforations distal perforation was primarily closed and proximal perforation site was exteriorized as loop ileostomy. And those with multiple perforation, gangrenous ileum or diseased ileum resection along with end ileostomy was done. Ileostomies were the choice of surgical intervention in the presence of multiple perforations and severe abdominal contamination based on level II evidence by Azad Patel et al⁽¹¹⁾ and Dr J.Ramanaiah et al⁽⁹⁾ shows that temporary defunctioning protective ileostomy in ileal perforation is lifesaving as it reduces the incidence of complications like Fecal Fistula.

Incidence of Surgical site infection is 31% and wound dehiscence is 3% both are on lower side compared to Abdul Ghaffar Ansari et al⁽⁸⁾ and none developed fecal fistula, the life-threatening complication.

The overall mortality rate in this study is 25%. The reported mortality after primary closure in Dr J.Ramanaiah et al⁽⁹⁾ ranges from 7.9% to 31%.Mortality was higher in those above 40 years of age. In this study mortality rate was 62% in those above 40 years of age. Mortality rate was 37% in those with Hb 10%, where as it is 13% in those with HB >10%. Two patients out of the three with multiple perforation had expired. Of the eight patients who expired three patients underwent resection with end ileostomy and three patients underwent primary closure with defunctioning loop ileostomy and one patient had exteriorization of perforation of loop ileostomy.

Finally typhoid accounts for 58% of the perforations in our study followed by tuberculosis with 20%. Verma H, Pandey S, Sheoran KD, et al⁽¹⁵⁾ also reported typhoid as the leading cause of the ileal perforation followed by TB.

CONCLUSION:

Non traumatic Ileal perforation has significant male preponderance with high incidence in third and fourth decades of life. Typhoid and TB are still the leading causes of the non-traumatic ileal perforation. Defunctioning loop ileostomy is found to decrease the incidence of dreadful complication like fecal fistula ,but in single pinpoint perforation with minimal contamination primary closure is found to be safe, however the overall mortality rate is not influenced by the type of surgery instead it depends on the age, general condition of patient and number of perforations and the time of presentation.

Declaration:

Authors declare no conflict of interest.

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