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A Comparative Prospective Study between the Outcome of Primary Repair versus Loop Ileostomy in cases of Ileal Perforation

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ABSTRACT

Introduction. Ileal perforation peritonitis is a common surgical emergency in the Indian subcontinent. It constitutes the fifth common cause of abdominal emergencies due to high incidence of typhoid because of poor hygeine in these regions.

Methods. One hundred and sixty proven cases of ileal perforation patients admitted to Surgical Emergency were taken up for emergency surgery. The surgical management was done as primary repair (group A) and loop ileostomy (group B). Results. An increased rate of postoperative complications was seen in group A when compared with group B patients.

Conclusion. In cases of ileal perforation temporary defunctioning loop ileostomy plays an important role. We recommend that defunctioning ileostomy should be preferred over primary repair. Though temporarily quality of life is hampered with defunctioning ileostomy but this procedure is lifesaving.

KEYWORDS :

Introduction

Perforation is said to occur once a pathology extends through the full thickness of the hollow viscous and leads to peritoneal contamination with intraluminal contents. Perforation can occur anywhere in the gastrointestinal tract starting from oesophagus to the rectum. [1]

In India, typhoid is the most common cause of ileal perforation while tuberculosis, trauma, and nonspecific enteritis follow. [2] The incidence of perforation in typhoid fever has been reported to be 0.8% to 18%. [3] Tuberculosis accounts for 5–9% of all small intestinal perforations in India. [4]

Typhoid fever is caused by a gram negative bacteria Salmonella typhi; it is a major public health problem in developing countries of Africa and Asia. The incidence of typhoid in Asia is around 274/100,000 persons per year.[5] India has highest incidence worldwide.[6] According to a study done in Kolkata in year 2008 showed the disease incidence of 214.2/100,000 population /year.

Other causes of nontraumatic ileal perforation include bacterial infections (yersinia, and tuberculosis), fungal infection (histoplasma), viral infections (cytomegalovirus, human immunodeficiency virus), parasitic infections (A. lumbricoides, E. vermicularis, and E. histolytica), and others (Wagener's granulomatous and drugs) . In a significant number of cases when the cause of perforation is not known, it is called nonspecific ileal perforation. Bowel perforation can cause spillage of contaminated bowel content into the abdominal cavity leading to peritonitis.[7]

These cases of perforation peritonitis often require ileostomy as a lifesaving measure. Indications for ileostomy are however altogether different in western countries such as inflammatory bowel disease, familial adenomatous polyposis, colorectal cancer, trauma, diverticulitis, pelvic sepsis, fistula, ischemic bowel disease, and radiation enteritis. [8]

The standard treatment for secondary peritonitis due to hollow viscous perforation is resuscitation followed by laparotomy. The different modalities for treatment include primary closure, resection, and anastomosis of small gut or diverting stoma, depending on the site and number of perforations, severity of peritonitis, and general condition of the patient. Ileostomy serves the purpose of diversion, decompression, and exteriorization. Primary ileostomy has been found to be superior to primary closure and resection and anastomosis as far as the morbidity and mortality are concerned and especially so in moribund patients presenting late in course of their illness, where it proves to be a lifesaving procedure [9]

Although ileostomy is a lifesaving procedure in such cases, yet it may result in significant number of complications as well. A small intestinal diverting stoma carries significant morbidity, mostly due to fluid/electrolyte imbalance and nutritional depletion. Peristomal skin irritation is the commonest complication of ileostomy leading to skin excoriation. [10] Other complications after ileostomy are bleeding, ischemia, obstruction, prolapse, retraction, fistula formation, stenosis, residual abscess, wound infection, para-stomal herniation and incisional hernia. In addition, ileostomy is known to adversely affect the quality of life due to physical restrictions and psychological problems .[11]

Various operative procedures were advocated by different authors, such as the following:

(i) simple primary repair of perforation [12];
(ii) repair of perforation with loop or double barrel ileostomy [13];
(iii) exteriorisation of perforation site [14,15];
(iv) single layer repair with an omental patch [16];
(v) resection and anastomosis [17].

Even with such a variety of procedures, ileal perforation still has a high rate of morbidity and mortality. The aim of the present study is to evaluate the outcome of primary repair versus loop ileostomy in cases of ileal perforation by comparing them in terms of postoperative morbidity, mortality and cost-effectiveness, hospital stay, complications and to find out the ideal procedure. The study will help to establish the criteria for instituting the management modality according to presentation and severity of the disease and the outcome of these procedures. Effective management of the disease will help in decreasing morbidity and mortality associated with the disease.

2. Material and Method

This comparative study was conducted in the Department of General Surgery, IIMS&R. The patients admitted to Surgical Emergency with acute abdomen were selected for the study. Only 160 patients which were proven to be cases of perforation peritonitis and only if on laparotomy were diagnosed to be of ileal perforation were included in the study and considered for comparative analysis. Out of these cases of ileal perforation selected, 54 cases (Group A) had undergone primary repair (resection-anastomosis) and 106 (Group B) were treated with ileostomy. The prophylactic antibiotics given in both the groups before surgery after admission to hospital were 3rd generation cephalosporin and metronidazole. Randomization was done on the basis of early and delayed presentation to the emergency. Patients who presented within 48 hours of onset of symptoms were treated by primary repair and were assigned as group A (54 cases) whereas, loop ileostomy was done in those patients who presented after 48 hours of onset of symptoms and were included in group B (106 cases). Comparative study was done between both procedures. All the operations were carried out by a group of experienced surgeons and all performed the same technique. In group A primary closure was done in two layers, the inner layer closed with 2-0 poly glycolic acid (vicryl) and outer layer closed with silk 3-0. Postoperative complications in each group like wound infection, wound dehiscence, intra abdominal abscess, faecal fistula, peritonitis, ileostomy related complications and intestinal obstruction were evaluated.

3. Results

During the24-month period of study (June,2013 to May2015), 160 patients with ileal perforation were studied. Ileal perforations were most commonly observed in third and fourth decade of life with males more commonly affected (Male : Female: 6 : 1) . Pain abdomen was the most common clinical presentation (100%) followed by, abdominal distension, and obstipation . Fever preceded the abdominal symptoms in these patients. The average duration of fever was 4.8 days whereas in patients with typhoid perforation, with positve widal test the average duration of fever was 9.4 days. For all the cases in the study group, the etiology of perforation was either typhoid, tuberculosis, trauma or non-specific causes.

Time since symptoms was within 48 hour in 54 cases that had undergone primary repair, and more than 48hrs in 106 cases that had undergone ileostomy. Most of these cases were operated within 24 hours of presentation after resuscitation.

The complications of the surgical interventions were then analysed.

Wound infection was the commonest complication amongst both the groups, being present in about 38 (23.8%) cases. 24.5% of cases underoging ileostomy (Group B) and 22.2% of those undergone primary repair (Group A) had wound infection.

Wound dehiscence was seen in 13% (7 out of 54) cases in group A and 3.8% (4 out 0f 106) in group B.

Peritonitis was seen more commonly in group A (20.4% cases of primary repair and 4.7% cases of ileostomy)

10 cases (18.5%) undergone primary repair also had faecal fistula as a complication.

Ileostomy related complications occurred in 34 patients (32%). Peristomal skin excoriation was the most common ileostomy related complication in 22 patients (20.8%) followed by retraction in 6 (5.7%), fluid and electrolyte imbalance in 6 (5.7%), and prolapse in 1 (0.1%).

The complications between the two groups were statistically significant with value 0.026, with chi square test value 9.24 with degree of freedom Df 3.

The average duration of hospital stay in patients having undergone primary closure was 16.2 days compared to 23.5 days in patients with ileostomy, which included ileostomy closure. In all the cases the biopsy was sent and histopathological examination was done and found to be typhoid enteritis 38 (23.8%), tubercular 16 (10%), and nonspecific inflammation in 80 (50%) cases. Rest of the cases 26 (16.3%) were due to trauma.

4. Discussion

Ileal perforation is a common surgical emergency in the Indian subcontinent. It is reported as the fifth common cause of abdominal emergencies due to high incidence in these regions of enteric fever and tuberculosis. Despite the availability of modern diagnostic techniques and advances in the treatment modalities, this disease, if not treated has an abrupt onset and a rapid downhill course with a high mortality. [18,19]

The important prognostic factors are onset of symptoms and time of presentation in hospital. An early presentation holds a good prognosis even with primary repair of perforation. In developing countries like India, the presentation to hospital is usually late with fully blown peritonitis; some cases may present with septicemia and multiorgan failure. [20] There are various operative procedures, such as simple primary repair of perforation , repair of perforation with covering loop ileostomy, primary ileostomy , single layer repair with an omental patch, and resection and anastomosis . In our study we compare the outcome of primary closure or resection and anastomosis versus loop ileostomy in ileal perforation in terms of complications between these two groups.

Small bowel perforations most commonly affect the young in the second and third decade of their life. In the present study male preponderance was found with male to female ratio of 6 : 1 which is the slightly higher than the ratio 4 : 1 reported by Adesunkanmi et al. [22] and Talwar et al. [23], while similar to the ratios reported by Beniwal et al. [24] that is 6.4 : 1 and 6.5 : 1 reported by Prasad et al. [25]

The mean age was 33.56 years with range of 18–64. Majority of patients were in the age group 21–40 years (53.33%). The peak incidence for age was in the fourth decade followed by third decade.[21-24]

The study gives an insight into the contemporary causes of traumatic as well as nontraumatic perforation of the small intestine in this part of the world on the basis of Widal reaction, operative findings, and histopathological examination. Typhoid remains the major identifiable cause of small bowel perforation, the second being tubercular perforation. Non-specific inflammation also constitutes as a major cause of perforation following them. Traumatic cause of ileal perforation was found to be in 10% of cases. The causes for nontraumatic ileal perforation as reported by Wani et al. [21], were enteric fever (62%), nonspecific inflammation (26%), obstruction (6%), tuberculosis (4%), and radiation enteritis (1%) Nadkarni et al. found 56.6% nonspecific causes, followed by typhoid perforation (25%) and tubercular perforation (9.3%) [1]

The morbidity was higher in patients who underwent ileostomy as compared to patients who underwent primary repair in our study. Wound infection was the most common postoperative complication, about 38 (23.8%) cases followed by ileostomy related complications, peritonitis, wound dehiscence, fecal fistula and electrolyte imbalance.

10 out of 54 cases of ileal perforation which proceed with primary repair had gross fecal contamination, out of ten; two cases had complication like anastomotic leak and subsequently reoperation was done; in one case ileostomy was done and in another case primary repair was done.

The complications between the two groups were statistically significant with value 0.026, with chi square test value 9.24, and with degree of freedom Df 3, which is in accordance with previous studies (value < 0.05) [12, 13].

The other complications which hampered the quality of life and significantly added to morbidity in group B patients were related to ileostomy. Ileostomy related complications occurred in 34 patients (32%). Peri-stomal skin excoriation occurred in 20.8% of the patients and this was the most frequently recognized early complication.[26] It was followed by retraction (5.7%), fluid and electrolyte imbalance (5.7%), and prolapse (0.1%).

The average duration of hospital stay in group A was 16.2 days compared to 23.5 days in patients in group B, which included ileostomy closure. The hospital stay of the patients was slightly longer in case of ileostomy in comparison with primary repair.

This study also highlights the role of salvage loop ileostomy as a life-saving measure for postoperative intestinal leakage in cases of primary repair of perforation. The authors recommend that urgent exploratory laparotomy must be undertaken whenever intestinal leakage is suspected in the postoperative period, and the continuing peritoneal contamination should be controlled by exteriorizing the site of intestinal leak as loop ileostomy.

It is perhaps difficult to advocate, whether ileostomy is better than primary repair of perforation because of small size of our study and small incidence of these complications. Thus it needs to be evaluated further with large number of patients; however for a single perforation, primary closure of the perforation was the procedure of choice where there is low volume of peritoneal contaminant.

5. Conclusion

Temporary diverting loop ileostomy in cases of ileal perforation plays an important role in reducing the incidence of almost fatal complications like fecal fistula. This helps to reduce the mortality in patients undergoing surgery for ileal perforations. But, ileostomy-related complications increase the postoperative stay of the patient. However these complications can be reduced, if not outright eliminated, by proper fashioning of the stoma and care of the stoma. We recommend that defunctioning loop ileostomy should be preferred over other surgical options in cases of ileal perforations in randomised study. It should be recommended that ileostomy in these cases is temporary and the extra cost and quality of life hampered by it are not more than the of life of the patient.

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