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Original Article

Surgery Section

Ileostomy for Non-Traumatic Ileal Perforations: Is this the Beginning of the End?

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ABSTRACT

Introduction: Ileal perforations are a common place of occurrence in emergency operation rooms around India. They are also significant contributors to mortality in our country. They are very distressing for patients because of the high morbidity of a laparotomy and in certain cases a stoma if its necessity is felt by the operating surgeon. The nature of the disease itself predisposes to a number of complications including wound infections, faecal fistulas and complications associated with a stoma.

Aim: To evaluate the role of ileostomy in patients with non-traumatic ileal perforation.

Materials and Methods: A total of 192 cases of ileal perforation, diagnosed per-operatively, were prospectively studied between June 2012 and July 2014. Cases were treated according to standard resuscitation protocols and underwent repair of the ileal perforation either as primary closure or as a bowel resection and anastomosis with or without a proximal diversion ileostomy. Cases were followed up for a period of six months and immediate and late complications and outcomes were noted.

Results: A total of 192 patients were studied during the given study period out of which 170 (88.5%) were males. The disease was treated primarily without diversion stoma in 176 patients and in 16 patients a proximal diversion ileostomy was performed. The overall mortality was 15 (7.8%) that was noted to be not significantly different in patients with respect to the performance of a stoma. Enterocutaneous fistula was a complication seen exclusively in the non-ileostomy group whereas stomal complications were expectedly noted only in the stoma group.

Conclusion: The authors found that though conventional ileostomy diversion may appear a safe option in patients with ileal perforations, it has its own additional morbidity, which at times can be very difficult to manage. An ileostomy is of use in a very small group of patients that is diminishing as better facilities and equipment are obtained to manage this dreaded disease.

Keywords: Emergency laparotomy, Enteric fever, Peritonitis

INTRODUCTION

An ileal perforation is a very common cause of significant discomfort for both the patient and the treating surgeon in operating rooms around the world. This is one disease where the morbidity and mortality has remained high inspite of advances in surgical techniques [1]. This is reflected in the fact that there have been numerous modalities suggested for the management of ileal perforations ranging from conservative management suggested by Huckstep, to simple closure of the perforation, placement of an omental patch, segmental or wedge resection with anastomosis. The studied procedures also include a diversion in some studies in the form of a diversion ileostomy or an ileotransverse bypass [2,3].

The predicament a surgeon often faces in an emergency surgery is to strike the right balance to achieve an optimum outcome. A multitude of factors come into play when a decision is to be made regarding the procedure to be done on the operating table. These include the age and general condition of the patient, the time interval between onset of symptoms and surgery, the contamination of the peritoneal cavity, the number of perforations, distance of the perforation from the ileocaecal valve and the presence of grossly unhealthy bowel [3-8]. A decision to either repair and primarily restore bowel continuity or to divert faeces through a loop ileostomy is one that has profound impact on the life of both the patient and the treating surgeon. While a primary restoration of bowel continuity has a greater risk of anastomotic leak or faecal fistula formation, an ileostomy while reducing the ill effects of a leak exposes the patient to many inconveniences that are not easy to handle.

A diversion ileostomy gained much popularity after being introduced by Turnbull and Weakley in 1966 [9]. It was touted to reduce complication rates and help patients tide over the acute crisis. A diversion loop ileostomy is found to be especially useful in tough operating situations like matted bowel loops, grossly unhealthy bowel or multiple perforations. Faecal diversion also enables early resumption of oral feeds which can hasten the recovery of the patient [6,10].

An ileostomy however, carries with it an inherent morbidity and significantly reduces quality of life in patients. It also causes an additional increase in the cost of healthcare which is a very important factor in developing countries where diseases that lead to ileal perforations are often endemic and are significant contributors to the surgical case load. Ileostomies themselves carry with them complications like skin excoriation, severe electrolyte abnormalities, retraction, prolapse, necrosis etc. They also require the patient to be subject to two surgeries, which also potentially increases the complication rate in these patients [11-13].

AIM

To evaluate the role of ileostomy in patients with non-traumatic ileal perforation.

MATERIALS AND METHODS

Patients diagnosed to have non-traumatic perforations of the ileum were studied from June 2012 to July 2014 at the emergency department of Bangalore Medical College and Research Institute after obtaining clearance from the ethics committee. All patients presenting with a clinical picture suggestive of perforation peritonitis were considered. For purpose of the study, patients were divided into two groups on the basis of the time duration of symptoms before presentation into early (<48 hours) and late (>48 hours).

Meticulous history taking and a thorough clinical examination was done in all patients. Further relevant haematological investigations were done along with an erect abdominal radiograph in all patients. Some patients underwent an ultrasonography of the abdomen when deemed necessary. Patients were treated aggressively with fluid resuscitation. All patients had nasogastric drainage and underwent bladder drainage through Foley's catheterization to monitor urine output. Dehydration and electrolyte abnormalities were noted and corrected. All patients underwent emergency laparotomy through a midline or right para-median incision. The diagnosis of ileal perforation was confirmed intraoperatively. Peritoneal fluid samples were collected for microbiological culture and sensitivity tests. Biopsy of the edge of the perforation was taken for histopathological examination.

The definite procedure performed for the ileal perforation was at the discretion of the operating surgeon. The decision to perform a diversion stoma was taken on the basis of various factors like number of ileal perforations, location of the perforations, status of the small bowel, extent of faecal contamination and patient's overall general condition. All patients were given a thorough peritoneal lavage with normal saline and drains were placed in the pelvis and the para-colic gutter (optional).

Postoperatively, all patients were put on broad spectrum antibiotics and depending on the culture and sensitivity reports were switched over to appropriate antibiotics. All patients received basic supportive measures like oxygen through nasal prongs, chest physiotherapy, incentive spirometry, etc. Postoperatively, patients requiring intensive care were shifted to the surgical ICU for invasive ventilation if required.

Patients were followed up from admission to discharge and for a minimum period of six months. Complications such as wound infection, burst abdomen, respiratory complications, faecal fistulae, intra-abdominal residual abscess and incisional hernia were studied. Patients with stomas underwent reversal under appropriate anesthesia. During reversal, the general abdominal cavity was not explored. Other factors such as the number of days of hospital stay and the patients in whom a re-exploration was deemed necessary were noted. All patients who were re-explored for faecal fistula underwent an ileostomy. This was not considered among patients who underwent ileostomy in their primary procedure. Patient's lost to follow up or those who died in the intervening period of unrelated causes were excluded from the study.

STATISTICAL ANALYSIS

The data collected was entered into a pre-structured proforma to note demographics, therapeutic intervention, intraoperative details and course in the hospital and follow up. Statistics were analysed using the SPSS software (v.20) to test the significance of difference between various observations.

RESULTS

A total of 192 patients who presented with non-traumatic ileal perforations were studied. Predominance of male patients was noted and most of the patients were in the 3rd to 5th decade of life.

The average interval between onset of symptoms and presentation was 27 hours in our study, ranging from ten hours to five days. Among the two groups of patients who presented late and early, the number was greater for those presenting early (145-early vs 47-late). Overall, 63 (32.8%) patients presented in shock (defined as a systolic BP of less than 100mmHg). 37 patients had anemia at presentation requiring postoperative blood transfusions. Pneumoperitoneum was noted on erect abdominal radiograph in 185 (96.35%) patients.

Enteric fever was the most common aetiological factor in our study with 124 patients afflicted by this disease. Non-specific inflammation i.e. a scenario wherein a definite diagnosis could not be reached in spite of relevant laboratory tests was the next most common diagnosis affecting 24.5% patients. Six cases were found to have ileal perforations secondary to Tuberculosis and the rest were secondary to obstruction.

Intraoperatively, 92.7% perforations were found to be located within the terminal two feet of the ileum. Multiple perforations were found in 8 (4.2%) patients with 13 (6.8%) and 171 (89%) patients having two and a solitary perforation respectively.

Among those presenting early, only two patients underwent a diversion stoma (1.3%). This number was much greater in patients who presented late {14 patients (29.8%)}. A total of 176 patients underwent a perforation repair without a diversion stoma. Among these 143 patients had presented early and 33 patients presented late. Among those undergoing repair without diversion, 110 cases underwent a simple closure of the perforation while 66 underwent resection of the affected segment with anastomosis. Among those undergoing stoma procedures, three patients had a primary stoma that was performed at the site of the perforation whereas the rest underwent a proximal diversion ileostomy with a repair of the perforation. The diversion stoma when performed was a loop ileostomy. None of the patients had a laparostomy.

The outcomes measured were respiratory complications, wound infection, faecal fistula occurrence, residual intra-abdominal abscess and incisional hernia. The overall results are presented in [Table/Fig-1]. The comparative results are tabulated in [Table/Fig-2,3].

An overall mortality of 7.8% was noted. Those patients presenting late had a significantly higher mortality (χ^2 = 5.957, d.f. (degree of

Complications	Number (Percentage)
Mortality	15 (7.8%)
Respiratory Complications	32 (16.6%)
Wound Infection	68 (35.4%)
Burst Abdomen	8 (4.2%)
Faecal Fistula	9 (4.6%)
Intra-abdominal abscess	9 (4.6%)
Incisional Hernia	14 (7.2%)

[Table/Fig-1]: Overall outcomes (n=192).

Complication	Primary repair (n=176)	Stoma (n=16)
Mortality	12 (6.82%)	3 (18.75%)
Respiratory complications	27 (15.34%)	5 (31.25%)
Wound infection	60 (34.09%)	8 (50%)
Burst abdomen	7 (3.98)	1 (6.25%)
Faecal fistula	8 (4.55%)	1 (6.25%)
Residual abscess	7 (3.98%)	2 (12.5%)
Incisional Hernia	10 (5.68%)	4 (25%)

[Table/Fig-2]: Comparative outcomes in patients undergoing stoma vs primary restoration of bowel continuity.

Complication	Repair (n=33)	Stoma (n=14)
Mortality	5 (15.15%)	3 (21.42%)
Respiratory complications	10 (30.30%)	4 (28.57%)
Wound infection	13 (39.39%)	6 (42.86%)
Burst abdomen	4 (12.12%)	1 (7.14%)
Faecal fistula	5 (15.15%)	1 (7.14%)
Residual abscess	5 (15.15%)	2 (14.28%)
Incisional Hernia	2 (6.06%)	1 (7.14%)

[Table/Fig-3]: Comparative outcomes in late (>48 hrs) presenting patients.

freedom) =1, p-value < 0.001). The operative procedure performed did not significantly alter the mortality in these patients (χ^2 =.874, d.f.=1, p-value>0.1). A total of nine patients developed faecal fistula, of which five patients died. This was found to be statistically significant with χ^2 =15.27, d.f.=1, p-value<0.001.

The average number of days of hospital stay for the primary repair group was 12 days overall. The average duration of stay was 11 days for the stoma group at the first admission and eight days for the stoma reversal. The stoma was reversed after an average of eight weeks after the first surgery.

In three patients who underwent a primary repair, re-exploration was done. Out of these, two were for a faecal fistula and one was for residual intra-abdominal abscess. In the two cases of faecal fistula that were re-explored, one patient was found to have a new perforation adjacent to the old site and one patient had anastomotic leak. Both underwent proximal diversion loop ileostomies. One patient with a primary stoma at perforation site had to be re-explored due to intra-abdominal abscess.

The most common stoma associated complication that was noted in our study was electrolyte imbalance that was seen in nine patients. Seven patients had skin excoriation. One patient notably had a faecal fistula due to anastomotic leak after closure of the stoma. One patient had incisional hernia at the site of the stoma.

DISCUSSION

Present study confirms the typical age and sex distributions of non-traumatic ileal perforations with preponderance for the male sex. This has also been reported by various other studies in the Indian context [14-16]. Enteric fever was found to be the most common cause of ileal perforation in our study. This is similar to the above mentioned studies done in the Indian sub-continent and also to the ones that have been done in the African continent [1,17,18]. Studies from the west however show a stark difference in that the perforations of the ileum are mostly due to diseases like Crohn's, perforated diverticula, radiation enteritis or foreign bodies [19,20].

A majority of our patients presented to us early i.e. less than 24 hours after the onset of symptoms. The late presentation was found to be the most important factor affecting prognosis in our study. This is also in concordance with previously conducted studies [7,10]. The authors found that there was a greater likelihood for a patient to undergo a diversion loop stoma if he presented late. This is a direct reflection of the fact that a delay in presentation leads to worsening peritoneal contamination and subsequently an increase in the adverse factors that lead to the creation of a diversion stoma.

During the course of the study, it was found that a faecal fistula was the most dreaded complication of ileal perforation and was the most common cause of death. Most of the faecal fistulae and the residual intra-abdominal abscesses in this study were managed conservatively. In this study it was found that out of the four patients who underwent re-exploration, two patients who were re-operated for faecal fistula died. Other studies carried out previously agree with the aforementioned that a faecal fistula is indeed a sinister complication that significantly alters the final outcome in these patients [21,22].

The current study shows slightly improved mortality rates (7.8%) in comparison to previous studies carried out in India [4,7,23]. This may possibly be attributed to a number of factors. Over the past few years, improvements have been noted in antibiotic therapy given in the perioperative period. There is also a greater accessibility to intensive care and the referral system from primary to tertiary care has strengthened. Also, the primary diseases causing the ileal perforation such as typhoid and tuberculosis are now being detected earlier and being treated more effectively than before.

The authors found that stomal complications like skin excoriation were worse with the three patients who underwent a primary exteriorization of the perforation. This procedure has its own controversies as many authors believe that a diversion ileostomy is a much better option [24]. This procedure however has the advantage in clinical situations where a minimal intervention is sought such as patients with extensive co-morbidities and poor general condition. Nonetheless, a primary exteriorization ileostomy offers no advantage over a proximal diversion with a repair of the perforation.

Skin excoriation and electrolyte imbalances were the most common complications of ileostomy in our study. These were controlled with the application of a sealant paste and frequent changes of the stoma bag. It has to be noted that there is a significant cost attached to the maintenance of the ileostomy including the cost of procurement of the bag and the paste. These patients are often from a poor socioeconomic background and often find it difficult to cope with these financial strains. This is also worsened by the fact that they have to get re-admitted for the reversal which worsens the financial burden as patients often are unable to carry on with their occupation during the intervening period.

Ileostomy closure was carried out after an average intervening period of 8 weeks. There have been reports in literature where the ileostomy closure has been attempted during the primary hospital stay with good results. However, in our setting where majority of the patients present in septicaemia, a longer recuperation period is advisable so as to minimize further complications during reversal [24].

LIMITATION

The major limitation of this study was the lack of randomization. The study was carried out among all the surgical units at Bangalore Medical College and Research Institute and we were not able to establish a standard operating protocol for the study. Currently plan is underway to start a randomized control trial on the same subject.

CONCLUSION

The authors would like to conclude that in the setting of a non-traumatic ileal perforation, a diversion ileostomy adds morbidity. Overall survival rates are however not significantly improved. This leads us to believe that greater care needs to be exercised in the choice of procedure while treating these patients. There is an urgent need to formulate standardized guidelines that may facilitate better on table decision making.

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