Nontraumatic ileal perforation : Surgical experience in rural population in Indian scenario

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Abstract

Objective: The purpose of our study was to review the clinical profile, etiology and optimal surgical management of patients with non traumatic ileal perforation.

Methods: The study is an observational study carried out for the period of 4 years in the department of surgery. A total of 71 patients admitted through accident & emergency department and patients from medical wards admitted and treated with fever and diagnosed with peritonitis were included in the study. A written informed consent was obtained from each patient/ patient relative. Demographics, anthropometrics and clinical profiles were collected. Lab investigations, x-rays , ultrasound of abdomen & pelvis, operative findings, duration of hospital stay , post operative complications and mortality were recorded.

Results: We have assessed and treated 71 cases of non traumatic ileal perforation; the causes for perforation were enteric fever [40(56.33%)], non specific inflammation[23(32.39%)],obstruction[ 7(9.85%)], tuberculosis[ 1(1.04%)] . The surgical procedures performed were simple/ primary closure (n=43), end to side ileotransverse anastomosis (n=2) primary ileostomy( n=6), and resection and end to end anastomosis (n=20).

Conclusion: Terminal ileal perforation should be suspected in all cases of peritonitis especially in developing countries . Optimization of surgical techniques should be based on the etiology, delay in surgery and operative findings. Timely surgical intervention within 24 hours with adequate and aggressive resuscitation can decrease morbidity and mortality.

Keywords: ileal perforation, surgery

1. Introduction

Ileal perforation accounts for major cause for obscure peritonitis This contribute to high morbidity and mortality in developing countries where medical facilities are not readily available⁴,⁶,⁷. The features mimic to acute abdomen pain in febrile infections such as appendicular pathologies and dengue haemorrhagic fever. Diffuse peritonitis due to ileal perforation requires a surgical emergency. Despite surgical advancement, non traumatic ileal perforation is usually associated with high morbidity and mortality. Non traumatic ileal perforation may include typhoid, tuberculosis and idiopathic in nature. Delay in surgical intervention is often accompanied in rural sectors and the places where medical facilities are scarce due to lack of specific and sensitive diagnostic investigations⁸,⁹,¹⁰,¹¹,¹². Surgical option such as Simple/Primary closure, Resection and end to end Anastomosis, Ileotransverse anastomosis, Primary Ileostomy are
commonly performed. Various factors play a vital role in morbidity and mortality in determining the outcome measures in Nontraumatic ileal perforation such as delay in presentation, anaemia, hypovolemic shock, septicemic shock, fecal contamination of peritoneum, age etc.\textsuperscript{13,14,15}

The present study was taken to see the outcome measures in clinical profile following different surgical management in ileal perforation over the 4 years.

2. Methods:

This was a prospective/observative study conducted in the department of general surgery for the duration of four years. All patients/patients relative provided written informed consent and the study was approved by the Institutional ethics committee. All the patients were admitted from inpatient/ outpatient department and casualty unit. Detailed history and examination was done by surgeons and general physician. Demographic profile, clinical features, baseline investigations such as complete blood count, renal function tests, X-rays of chest and erect abdomen, Ultrasound of abdomen and pelvis was collected from all the patients. Suspicous cases Widal test was performed. Initially treatment approach focussed on stabilisation by means of intravenous fluids, electrolyte imbalance correction, broad spectrum antibiotics and gut decompression with Ryle’s tube. Once the patients were stabilised, they underwent exploratory laparotomy under general anaesthesia by expert general surgeon using midline incision. Decision regarding type of surgical procedure was decided on table, depending on the intra operative findings. A thorough peritoneal lavage with 3-5 litres of warm normal saline was done followed by placing drains in right paracolic gutter and the left drain in the pelvis.

The period of delay in surgery was taken from the onset of symptoms of pain abdomen, distension and vomiting. Postoperatively patients were followed up for complications such as wound infection, dehiscence and leak, respiratory tract infections, residual abscess, fecal fistula and death. operative findings, duration of hospital stay, post operative complications and mortality.

Edge biopsy/ resected bowel was sent for histopathological examination in all the patients.

3. Results:

The demographics and clinical profile were given in table-1.

There were a total of 71 cases with non traumatic ileal perforations of terminal 2 feet of ileum. 5 of these were traumatic and were excluded from the study. The age of remaining 71 patients ranged from 13 years to above 50 years as shown in table- 1. There were males 62 (87.32%) and females 9 (12.68%). Majority of the patients presented with abdominal pain 71(100 %), distension of abdomen 69(97.18 %), vomiting 50 (70.42%) fever 40 (70.42 %) constipation 10 (14.08 %) table-2. Widal test was positive in 40 (56.33 %). Most sensitive of all the investigations was USG abdomen & pelvis which showed free fluid and grossly distended bowel loops in 71 ( 100 %) of patients and X-ray erect abdomen revealed pneumoperitoneum 70(98.59 %) and multiple air fluid levels 40(56.33 %). Leucocytosis (>11x10\textsuperscript{9} / L) was present in 40 (56.33 %). Emergency Exploratory laparotomy was performed in all 71 cases within 24 hours of admission to the hospital. The mean delay in surgery was 46 hours and was mainly pre hospital.

On laparotomy peritoneal cavity was highly contaminated with fecal matter in 11 patients, purulent in 39 , serous in 20, and 1 had no fluid. 53 patients had single perforation in the terminal ileum, 2 perforations at varying distance of terminal ileum in 9 patients and 3 in 4 patients and more than three in 5 patients. Table-3. Perforations were surgically treated depending upon the number of perforations , general health status of the patient and degree of fecal contamination. Majority of patients, 40 had typhoid perforation , nonspecific inflammation 23 , obstruction 7 ,Tuberculosis 1. The surgical management of all 71 cases is depicted in table -4. Three patients underwent reexploration for fecal fistula and ileostomy was done in these cases.

4. Discussion:

Non traumatic ileal perforation is a common cause for peritonitis as it presents a diagnostic dilemma to the surgeon. Laparotomy is usually under taken often suspecting perforated appendicitis / duodenal ulcer/gastric perforation.

The mean age in our study was higher than other studies\textsuperscript{5} as the children below 12 years were excluded from our study and also causes other than typhoid were included. The clinical features were similar to any other acute abdomen and decision for laparotomy was made on clinical grounds and complemented by USG & Erect abdomen findings. The delay in
surgery from the time of onset of symptoms was mainly pre hospital. This is due to the fact that most of the cases were referred late from remote areas where medical facility is scarce. In traumatic perforations it was not a problem in surgical management as they were brought early and the patients presented in good clinical state and tissues were healthy.

Typhoid fever is noted as a serious global health problem by WHO. It is a predominant cause of nontraumatic perforation in developing countries and in areas where poor socioeconomic levels and unsanitary environmental conditions are followed. The incidence of typhoid is highest in children. In our study the incidence was highest in mean age group ranging from 13 to 30 years, which is similar to other previous Studies and male preponderance was noticed which was consistent with other studies. Nonspecific inflammation of the terminal ileum was the other predominant cause, in this the operative findings were same as typhoid perforation but there was no laboratory histopathological evidence. We had one patient with tubercular perforation in the terminal ileum. We found small bowel obstruction as another important cause for terminal ileal perforation in our study. There were 53 cases with single perforation, 9 patients had 2 perforation and 9 had multiple perforations and all the perforations were 5 to 60 cms from ileocaecal junction along the anti mesenteric border of ileum. Late presentation, delay in operation (>48 hours), multiple perforations and gross contamination of the peritoneal cavity with pus and fecal material affected the incidence of fecal fistula and wound dehiscence and subsequent mortality. The peritoneal fluid content and delay in surgical time increase the severity of contamination and friability of the bowel. In literature it is usually advocated that last 60 centimeters of the ileum should be resected. However in our study various surgical techniques were performed, though mortality and morbidity remained high and most dreaded complication being fecal fistula and wound dehiscence. The peritoneal fluid content and delay in surgical time increase the severity of contamination and friability of the bowel. In literature it is usually advocated that last 60 centimeters of the ileum should be resected. However in our study various surgical techniques were performed, though mortality and morbidity remained high and most dreaded complication being fecal fistula and wound dehiscence. Simple closure of the perforation was the commonly used technique after edge biopsy for, single perforation with minimum contamination of the peritoneum. And for multiple perforations close to each other, we preferred resection and anastomosis in our set up. In toxic and moribund patients with grossly contaminated peritoneum a temporary ileostomy was opted though the maintenance postoperatively was cumbersome and required a second surgery this technique showed good results in the patient’s well being postoperatively, and were allowed oral feeds early, and discharged early in our study. Resection and anastomosis carried higher morbidity and mortality in our study. End to side ileotransverse anastomosis with closure of the distal stump, (though the anatomical continuation is preferred by many surgeons to avoid blind loop syndrome) was considered to resection and end to end anastomosis in this study when an anastomotic leak was feared. The patients with this technique did well in our study. However, the small number of patients who underwent this technique in our study is our limitation and more study is recommended.

5. Conclusion

Terminal ileal perforation should be considered as one of the cause in patients presenting with peritonitis. Enteric fever is still the common cause for small bowel perforation. The surgical options should be considered according to operative findings. Morbidity and mortality are not only dependent on the surgical technique, but also on clinical presentation, general condition of the patient, delay in hospitalization, perforation to surgery interval, and perioperative management.

Hence early diagnosis and hospitalization, aggressive adequate preoperative resuscitation, and good postoperative care can lower the incidence of morbidity and mortality.

Table-1. Showing Age Distribution

| SI No | Age distribution | No of Patients | Percentage % |
|-------|------------------|----------------|--------------|
| 1.    | 13 – 20 years    | 14             | 19.71        |
| 2     | 21 – 30 years    | 18             | 25.35        |
| 3     | 31 – 40 years    | 17             | 23.9         |
| 4     | 41 – 50 years    | 13             | 18.30        |
| 5     | > 50 years       | 9              | 12.67        |
| Total |                  | 71             |              |

$X^2 = 3.577 \ p = 0.466$ NSS
Legend 1a: Bar Graph Depicting Age Distribution.

![Age distribution graph](image)

Table-2: Showing clinical Presentation.

| SI No | Clinical features              | No of patients | Percentage % |
|-------|--------------------------------|----------------|--------------|
| 1     | Abdominal pain                 | 71             | 100          |
| 2     | Fever                          | 50             | 70.42        |
| 3     | Abdominal Distension           | 69             | 97.18        |
| 4     | Vomiting                       | 50             | 70.42        |
| 5     | Constipation                   | 10             | 14.08        |
| 6     | Dehydration                    | 60             | 84.50        |
| 7     | Shock                          | 10             | 14.08        |
| 8     | Anaemia                        | 6              | 8.45         |
| 9     | Tenderness                     | 71             | 100          |
| 10    | Rigidity                       | 69             | 97.18        |
| 11    | Obliteration of liver dullness | 69             | 97.18        |

Fig-2a: pie diagram showing clinical presentation.

![Clinical Presentation](image)
Table 3: Showing time at admission and surgical intervention.

| Time at presentation | No of Patients ( % ) |
|----------------------|----------------------|
| Within 24 hrs        | 71(100)              |
| 24-48 hrs            | Nil                  |
| 48 – 72 hrs          | Nil                  |
| 72 – 96 hrs          | Nil                  |
| 96 – 120 hrs         | Nil                  |
| 120 – 144 hrs        | Nil                  |

Table 4: Showing Number of perforations in the terminal ileum.

| SI No | No of perforation | No of Patients ( % ) |
|-------|-------------------|----------------------|
| 1     | One               | 53(74.64)            |
| 2     | Two               | 10(14.08)            |
| 3     | Multiple          | 8(11.26)             |

X^2=54.62 p=0.001 VHSS

Fig-4a: Bar diagram showing number of perforations.

Table 5: Showing Type of Peritoneal Fluid Collection

| Time at presentation | No of Patients ( % ) |
|----------------------|----------------------|
| Within 24 hrs        | 71(100)              |
| 24-48 hrs            | Nil                  |
| 48 – 72 hrs          | Nil                  |
| 72 – 96 hrs          | Nil                  |
| 96 – 120 hrs         | Nil                  |
| 120 – 144 hrs        | Nil                  |
Fig-5a: pie diagram depicting type of peritoneal fluid collected.

Table 5: Showing Type of Peritoneal Fluid Collection

| SI No | Peritoneal Collection          | No of Patients (%) |
|-------|--------------------------------|--------------------|
| 1     | No collection                  | 1 (2)              |
| 2     | Reactive / serous Fluid        | 20 (28.16)         |
| 3     | Purulent                       | 39 (56.33)         |
| 4     | Feculent                       | 11 (15.49)         |

X² = 44.09 P = 0.001 VHSS

Table -6: Showing various etiology.

| SI No | Etiology                        | No of patients (%) |
|-------|---------------------------------|--------------------|
| 1     | Typhoid                         | 40 (56.33)         |
| 2     | Non – Specific inflammation     | 23 (32.39)         |
| 3     | Obstruction                     | 7 (9.85)           |
| 4     | Tuberculosis                    | 1 (1.40)           |

X² = 51.76 P = 0.001 VHSS

Fig-6a: pie diagram showing etiologies.
Table 7: Showing Findings On Investigations

| SI No | Investigation                  | Positive(%)  |
|-------|--------------------------------|--------------|
| 1     | Widal’s Test                   | 40(56.33)    |
| 2     | Pneumoperitonium               | 66(92.95)    |
| 3     | Multiple Air Fluid Levels      | 40(56.33)    |
| 4     | Free Fluid in Peritoneal Cavity| 69(97.18)    |

Table 8. Showing Post Operative Complications

| SI No | Post Operative complications | No of patients | Percentage (%) |
|-------|------------------------------|----------------|----------------|
| 1     | Wound Infection              | 8              | 11.26          |
| 2     | Septicemia                   | 4              | 5.63           |
| 3     | Respiratory Tract Infection  | 3              | 4.22           |
| 4     | Shock                        | 3              | 4.22           |
| 5     | Wound dehiscence             | 9              | 12.67          |
| 6     | Fecal Fistula                | 3              | 4.22           |
| 7     | Residual Abscess             | 3              | 4.22           |
| 8     | Renal failure                | 5              | 7.04           |

\[ X^2 = 5.42 \text{ P}=0.247 \text{ NSS} \]

FIG-8a: pie diagram depicting postoperative complications.

Table-9: Showing Duration Of Hospital Stay

| SI No | Duration of Hospital Stay | No of Patients |
|-------|---------------------------|----------------|
| 1     | < 10 Days                 | 4              |
| 2     | 10 – 20 Days              | 51             |
| 3     | 21 – 30 Days              | 10             |
| 4     | > 30 Days                 | 6              |

Mean duration of stay 17.5 days \[ X^2=84.09 \text{ P}=0.001 \text{ VHSS} \]
Fig-9a: bar graph showing hospital stay.

![Bar Graph]

Table 10: Types of Operations Performed And Mortality.

| SI No | Operations Performed                                      | No of Patients | Death |
|-------|-----------------------------------------------------------|----------------|-------|
| 1     | Simple Closure                                            | 43             | 2     |
| 2     | Resection and end to end Anastomosis                      | 20             | 2     |
| 3     | Resection with end to side ileo transverse anastomosis    | 2              | 0     |
| 4     | Side to Side Ilio Transverse Anastomosis                  | 0              | 0     |
| 5     | Ileostomy                                                 | 6              | 1     |

Fig-10 a: pie diagram showing operations performed.

![Pie Chart]

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