

ORIGINAL ARTICLE

NON-TRAUMATIC SPONTANEOUS ILEAL PERFORATION:
EXPERIENCE WITH 125 CASES

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Background: Non-traumatic ileal perforation is a common cause of obscure peritonitis in developing and underdeveloped world. The perforation of the ileum is one of the causes of peritonitis that is difficult to diagnose preoperatively. The objective of the study was to determine the increasing frequency of cases of non-traumatic ileal perforations and their subsequent management **Methods:** This descriptive case-series included 125 cases presenting in surgical emergency of Lahore General Hospital from 1st January 2014 to 1st December 2014. All patients were resuscitated and underwent emergency exploratory laparotomy. **Results:** The causes for perforation were enteric fever in 82 cases (65.6%), tuberculosis in 38 cases (30.4%), adhesions and other causes in 5 cases (4%). The main presenting symptom in all patients were severe abdominal pain associated with fever and abdominal distension. Perforations were surgically treated depending upon the number of perforations, general health status of patient and degree of fecal contamination. In total out of 125 cases, primary repair was done in 9 cases, resection and end to end anastomosis in 19 cases and in 13 patients' resection and ileotransverse anastomosis was done. In the case of 78 patients loop ileostomy was done and in 6 patients double barrelled ileostomy was performed. **Conclusions:** The incidence of terminal ileal perforations due to typhoid and the tuberculosis is high and carries high mortality and morbidity rates in delayed presentations. Therefore, it is high time now that general public health awareness should be created regarding food handling, sanitation and personal hygiene.

Keywords: typhoid, terminal ileum, tuberculosis, perforations

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INTRODUCTION

Non-traumatic ileal perforation is a common cause of obscure peritonitis in developing and underdeveloped world. The perforation of the ileum is one of the causes of peritonitis that is difficult to diagnose preoperatively. In developing world ileal perforations due to enteric fever and tuberculosis are very common.^{1,2}

The clinical presentation in non-traumatic ileal perforation is nonspecific. Patients complain of abdominal pain along with other symptoms like fever, vomiting and abdominal distension. Diagnosis is mainly clinical, supported by radiological findings of free gas under the diaphragm and ultrasound showing free fluid in the peritoneal cavity and distended loops of intestine. Laboratory investigations are not helpful in all the cases.³

Typhoid ileal perforations is the commonest cause of perforation peritonitis in the developing countries.⁴ Typhoid fever is common in our country primarily because of poor sanitation and uncontrolled waste disposal system. The most lethal complications of typhoid fever are ileal perforation and intestinal bleeding both arising from necrosis of Peyer's patches in the terminal ileum. Typhoid ulcers can occur anywhere from stomach to rectum but terminal ileum is mostly involved due to increased number of Peyer's patches in the terminal ileum.^{5,6} Typhoid fever is a

disease of long duration that includes bacteraemia phase with fever and chills during the first week, widespread reticuloendothelial involvement with rash, abdominal pain and prostration in the second week, and ulceration of Peyer's patches with intestinal bleeding and perforation during the third week. There are longitudinal ulcers on anti-mesenteric border, situated within 45 cm of the ileocecal valve in majority of the patients. In Pakistan the majority of the cases of typhoid fever are due to *Salmonella typhi* or *Salmonella paratyphi-A*, while very few are due to *Salmonella paratyphi-B* or *C*. This is in contrast to the western studies where majority of the cases are due to *Salmonella paratyphi-A, B*.^{7,8} Surgical treatment for the typhoid perforation is quite variable which includes primary closure of perforation, segmental resection and anastomosis.^{9,10} The best survival rates after ileal perforation in the typhoid fever are to be found in patients undergoing operations within 24 hours of the incidence of perforation. The overall survival of patients undergoing surgery for perforation is 70-75% but is as high as 97% in the best services.¹¹

Primary intestinal tuberculosis (without pulmonary involvement) is one of the commonest forms of extra pulmonary tuberculosis. The infection is usually caused by ingestion of un-pasteurized or contaminated milk that leads to a primary infection of the intestine in the absence of the pulmonary disease.

Intestinal tuberculosis commonly affects the ileocecal region because of the following reasons: 1) the terminal ileum is an area of physiological stasis 2) it has abundant typhoid tissue and 3) it has high absorptive capacity. Thus, after the initial infection occurs in the Peyer's patches, mucosal oedema and sloughing occurs, leading to the formation of typical tuberculosis ulcers that lie transversely to the long axis of the ileum. The disease may spread further by the dissemination through the lymphatics and by caseation, and may heal by fibrosis or may even remain confined to the area if host's defence mechanisms are adequate. The incidence of perforation in patients with the intestinal tuberculosis varies from 1–11%, the majority of these perforations (70–80%) are not truly perforations of such tubercular ulcers, but are the blow outs of the small bowel secondary to distension due to the distal obstruction (strictures or adhesions). As such, true or 'free' perforations are rare, and only few cases have been reported with overall mortality of nearly 70%. Recently, vasculitis of the mesenteric vasculature due to the tuberculosis has been implicated as the contributory factor, but the exact mechanism of which some patients develop perforation and others is not established.¹² The incidence of tuberculosis is on the rise with majority of cases in South East Asia. This study was done with the aim to know the frequency of these infectious diseases causing abdominal emergencies.

MATERIAL AND METHODS

This descriptive case-series included 125 patients presenting in the surgical emergency of Lahore General Hospital from 1st January 2014 to 1st December 2014 with the suspicion of terminal ileum perforation who underwent exploratory laparotomy.

The diagnosis of terminal ileal perforation was based on the following diagnostic criteria; acute abdominal pain, fever, vomiting, abdominal distension, with tenderness, total leukocyte count (TLC) $>11 \times 10^9/L$ and positive serological test (Widal test, 1/320) for typhoid cases. The data was further supported by a detailed drug history which included anti tuberculosis treatment (ATT) course in tuberculosis patients and use of antibiotics in case of previous history of typhoid. Similarly any evidence of past surgery was recorded. The diagnosis was supported by free fluid in the peritoneal cavity and chest X-ray findings of gas under the diaphragm. The diagnosis was confirmed by preoperative findings of terminal ileal perforations in all the cases. All the patients were treated as surgical emergencies and underwent proper resuscitation with IV fluids, broad spectrum antibiotics, and nasogastric tube insertion. A vigilant and proper input/output charting was done. All the data was recorded on a *pro forma*.

Written consents were taken from all the patients. All the patients underwent exploratory laparotomy by midline incision. The operative procedure was decided on the basis of operative findings, number of perforations, degree of gross contamination, and patient's condition.

In all the cases biopsies were taken from the perforation sites and sent for histopathological examination, postoperatively patients were followed up in the ward. A complete record of complications like wound infection, fistula formation, and ileostomy excoriation, and residual collection was recorded and managed accordingly. Data was entered and analysed using SPSS-16.

RESULTS

A total of 125 cases of ileal perforations were included out of which 96 (76.8%) were males and 29 (23.2%) were females. The age range was between 15–30 years with a mean of 22.96 ± 4.8 years. Pre-operatively, causes of perforation preoperatively were: enteric fever in 82 (65.6%), tuberculosis in 38 (30.4%), adhesions and other non-specific causes in 5 (4%) cases. All of patients underwent exploratory laparotomy through midline incision and their on-table per-operative findings were recorded which included the number of perforations, degree of peritoneal contamination, the viability of gut, and free fluid in the peritoneal cavity. The presenting symptoms in all our patients were severe pain (100%) fever (87%), abdominal distension (75%), and 38% patients with vomiting.

Biological and radiological investigations were sent immediately in surgical emergency. Air fluid levels were seen in 95 (76%) cases. In 87 (69.6%) cases free fluid and distended gut loops were seen on ultrasonography. Raised TLC was seen in 78 (62.4%) of our cases Widal test was positive (O antigen $<1/320$) in 41 (32.8%) of the patients.

The number of perforations was noticed preoperatively with interventions are shown in table-1. The post-operative complications are shown in table-2.

The average hospital stay of the patient was 14 ± 3.27 days whereas those patients who developed wound dehiscence, fistula formation and peri-stomal excoriation (n=40) stayed for a mean period of 22.4 ± 4.7 days

Table-1: Number of perforations and surgical interventions

No. of perforations	1	2	>2
No. of cases	39 (31.2%)	62 (49.6%)	24 (19.2%)
Primary repair	5 (12.8%)	4 (6.45%)	0
Resection and end-end anastomosis	12 (30.7%)	7 (11.29%)	0
Resection ileo-transverse anastomosis	5 (12.8%)	8 (12.9%)	0
Loop ileostomy	11 (28.2%)	43 (69.35%)	24 (100%)
Double barrelled ileostomy	6 (15.3%)	0	0

Table-2: Post-operative complications (n=125)

Complications	Frequency	%
Wound infection	38	30.4%
Wound dehiscence	9	7.2%
Ileostomy retraction	2	1.6%
Fistula formation	4	3.2%
Prolonged ileus	7	5.6%
Intra-abdominal abscess	2	1.6%
Peristomal excoriation	27	21.6%
Residual collection	8	6.4%

DISCUSSION

In our study during the last 11 months high frequency of cases presented in emergency with similar symptoms and likelihood of terminal ileum perforation. Small bowel perforation is a potentially fatal complication. The leading cause is typhoid enteritis followed by abdominal tuberculosis. The reported mortality of 40–55% in a small bowel perforation is high keeping in view the younger ages of many of the patients. Diagnosis of typhoid is confirmed by the Eggleston criteria, which is the isolation of the organism from the blood, urine or stools, apposite Widal's test and typical operative findings.

We proceeded with initial resuscitation which included intravenous fluids and broad spectrum antibiotics. Baseline investigations and radiological investigations revealed leukocytosis in 78 cases and positive Widal test in 41 cases. In a series of 79 patients, Wani *et al* found that only 29% of the patients with non-traumatic perforation of terminal ileum have leukocytosis.¹ Furthermore no single investigation had a high diagnostic accuracy. All of our cases underwent exploratory laparotomy through midline approach within 8-16 hours in lieu of their toxic and deteriorating condition. The limitation included the availability of theatre due to increased load of emergency.

In our study enteric fever was the predominant cause of terminal ileal perforation followed by tuberculosis. In this study the incidence was found to be very high in young people ranging from 15-35 years, which is comparable with a study of Shaikh *et al* conducted at Chandka Medical College Larkana, who showed up to 80% incidence ranging from 13 to 30 years.¹⁵ Ali S *et al* also reported highest incidence in young age group i.e., 64% ranging from 21 to 30 years.¹⁴ But the incidence reported by study conducted on 82 patients by Abdullah *et al* in Baghdad varies considerably where the mean average age was 42 years.³

In the present study the most important complication was wound infection which accounted for 30.4%, this figure is comparable with the study of Ansari AG *et al*, and he reported 27.3% wound dehiscence in this study. Rashid A *et al* revealed

12.5% cases. Wound dehiscence was noted in 7.2% of our patients.¹⁵

Late presentation, delay in operation (>48 hrs), multiple perforations and drainage of copious quantities of pus and faecal material from the peritoneal cavity adversely affected the incidence of faecal fistula and subsequent mortality. The peritoneal fluid content and delay in operation-perforation time also determine the severity of contamination and friability of gut. Various surgical procedures have been used for distal ileal perforations with variable results. Unfortunately no matter what procedure is used postoperative mortality and morbidity remains high. The most deadly complication is faecal fistula and the wound dehiscence. In the severely contaminated cases with gross contamination, friable terminal ileum, those with delayed presentation, multiple perforations, and faecaloid peritonitis, ileostomy can be a better option.

The management protocol of ileal perforations regarding the surgical repair vary. Different studies have discussed different surgical options and interestingly there is a study recommending ileostomy in all the cases. Ileostomy has also been treatment of choice in some other studies including the one conducted at LUMHS, Jamshoro.¹⁶ In the present study the type of surgical intervention was dependent on the general condition of the patient, preoperative resuscitation, delayed operation, the degree of contamination and the number of perforations. All the tuberculosis cases in this study were put on combination anti-tuberculosis chemotherapy for a period of 9–12 months.

The most common complication in our study was wound infection followed by ileostomy excoriation. The operative findings are typical with most enteric perforations on the anti-mesenteric border of the terminal 50–60cm of the ileum. The operative management consist of liberal peritoneal lavage with the closure of the perforation. Patients usually present very late in surgical emergencies with severe abdominal pain and fever and are usually very toxic where urgent exploratory laparotomy is required, where further delay is associated with definitive morbidity and mortality.

In Pakistan, contamination of the drinking water and the eatables are the major sources, dairy products made from un-pasteurized and non-boiled milk. Oral transmission via food handled by an individual who chronically sheds bacteria mainly through stool. Hand to mouth transmission after using a contaminated toilet and neglecting hand hygiene. An inoculum as small as 100,000 organisms cause infection in more than 50% of healthy volunteers. The surprisingly increasing number of cases due to typhoid and tuberculosis perforations in

young population is quite alarming, therefore it is high time now, and health awareness regarding the sanitary habits, personal hygiene, and food handling is therefore urgently required.

CONCLUSION

Both typhoid fever and tuberculosis are associated with significant morbidity and mortality in our population. Early presentation and diagnosis are vital to avoid postoperative complications. In patients where the terminal ileum is grossly inflamed with multiple perforations resulting in faecal peritonitis, exteriorization is a safe option which remained a mainstay of treatment in our study.

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