



A CLINICAL STUDY OF PRESENTATIONS, ETIOPATHOGENESIS AND MANAGEMENT OF NON TRAUMATIC ILEAL PERFORATION

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ABSTRACT **Introduction:** Hollow viscus perforations leading to peritonitis is one of the most common emergency surgeries conducted in a surgical practice for a cause of acute abdomen. It's the second most common cause for acute abdomen following appendicitis, accounting for 30-40% of total cases of acute abdomen presenting to the emergency. **Aim And Objectives:** To study the incidence of non traumatic ileal perforations, its clinical profile along with age, gender and cause based distribution of non traumatic ileal perforation. To study the different modes of management and its outcome. **Materials And Methods:** It is a prospective study on patients admitted as in patients and diagnosed as non traumatic ileal perforations in general surgery ward of GMCH, Guwahati between 1st July 2018 to 30th June 2019. After admission a short history was taken and physical examination was conducted. Patients were then explained about their disease process and the possible line of management. Baseline investigations were done followed by imaging studies. Strict aseptic precautions were followed during the operation. **Observations And Results:** Out of 51 patients, 80.4% were males. Majority of patients presented within 48 hours of onset of symptoms of peritonitis. The patients presenting with increasing lag period were associated with more mortality and morbidity. All patients underwent emergency exploratory laparotomy. Terminal ileum was most commonly involved with 72.5% perforation single in number. In early post operative period 59% patients suffered from some form of complication. **Conclusion:** The present study reflects that typhoid is the most common cause of non traumatic ileal perforation, followed by non-specific perforations. Widal serology is a useful test in the diagnosis of typhoid fever. Histopathology is useful in the diagnosis of tubercular perforations. Typhoid perforations have a significantly higher morbidity rate. The type of surgical procedure did not influence outcome. Pre operative presence of shock and hypoalbuminemia affected mortality and in addition azotemia affected morbidity of patients

KEYWORDS : Hollow viscus perforation, perforation, ileum, tuberculosis, typhoid, laparotomy, emergency surgery

INTRODUCTION

Hollow viscus perforations leading to peritonitis is one of the most common emergency surgeries conducted in a surgical practice for a cause of acute abdomen. It's the second most common cause for acute abdomen following appendicitis, accounting for 30-40% of total cases of acute abdomen presenting to the emergency. Among cases of hollow viscus perforation, duodenal and gastric perforation are the commonest accounting to 60-80% cases followed by ileal then appendicular and large bowel perforations.¹

Non-traumatic small bowel perforation is uncommon but can be fatal. Typhoid fever and tuberculosis are the common causes of such perforation in the developing countries, while in western countries non-infectious pathology is more common. Peritonitis following perforation may lead to multi-organ failure and death unless it is treated promptly and vigorously.² Ileal perforation is a common problem seen in tropical countries, the commonest cause being typhoid fever. In western countries the causes are malignancy, trauma and mechanical aetiology, in the order of frequency. Over the years a definite changing trend has been observed in ileal perforations both in terms of causes, treatment and prognosis. Better antibiotics, aggressive surgery and the elimination of conservative treatment, better preoperative and postoperative care have all significantly contributed to the improvement in patient outcome.

But still cases of ileal perforation cause a significant morbidity and mortality that persists despite the significant changes in health care over the years.^{3,4,5} In the presence of advanced anaesthesia of today and tremendous improvement in resuscitative measures, every patient diagnosed to have ileal perforation is universally recommended to be treated surgically. The purpose of operative protocol is to correct the pathology while avoiding any serious accidents and to adopt a surgical procedure which is associated with minimal complications.

AIMS AND OBJECTIVES

1. To study the incidence of non traumatic ileal perforations in emergency setup of Gauhati Medical College Hospital.
2. To study the clinical profile of patients presenting with non traumatic ileal perforations along with age, gender and cause based distribution of non traumatic ileal perforation.
3. To study the different modes of management and its outcome.

MATERIALS AND METHODS

It is a prospective study on patients admitted as in patients and diagnosed as non traumatic ileal perforations in general surgery ward of GMCH, Guwahati between 1st July 2018 to 30th June 2019.

Inclusion Criteria:

All non traumatic cases of acute abdomen where there were signs of peritonitis which were later diagnosed to be ileal perforation during investigations and operative management.

Exclusion Criteria:

Traumatic ileal perforations and patients less than 12 years of age.

The data is collected by direct interview with the patient and thorough clinical examination. Clinical findings and relevant diagnostic investigations performed over the patient. Cases were resuscitated with intravenous fluids and antibiotics. Most cases received ceftriaxone and metronidazole. In cases of gross contamination piperacillin and tazobactam was added. All patients underwent laparotomy under general anesthesia.

The type of peritoneal contamination, number, site, size of perforations and procedures employed were noted. The choice of procedure was based on surgeon's preference and condition of the perforation. Antibiotics were routinely given for 5-7 days unless the diagnosis was typhoid in which case antibiotics were continued for up to 10 - 14 days. A diagnosis of typhoid was made only if Widal test was positive, or *Salmonellae* were isolated from blood or urine and if histopathological evidence of typhoid perforation was found. When the etiology of a non-traumatic perforation was not found, it was termed non-specific. Postoperative complications were noted. The factors influencing mortality and morbidity and outcome were assessed.

OBSERVATIONS AND RESULTS

Fifty one patients of Ileal Perforation admitted between July 2018 and June 2019 were included in this study. 27 presented with typhoid fever, 4 were diagnosed with Tuberculosis (TB), 1 with Meckel's Diverticulum and rest were non specific. There was a male preponderance with the male: female ratio in this study being 4.1: 1. Seven cases of typhoid perforations, two cases of non specific and one case of TB perforation were seen in females.

Table 1: Symptoms Of Ileal Perforations

Symptoms	Typhoid	Non specific	TB	Meckels
Abd pain	27	19	4	1
Fever	24	15	3	1
Vomiting	15	10	1	1
Constipation	4	1	0	0
Diarrhoea	5	2	0	0

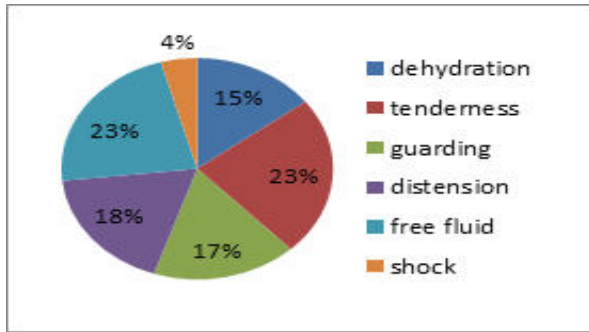


Figure 1: Signs Of Ileal Perforations

Pneumoperitoneum in erect abdominal x-ray was seen in 56% of patients. Haemoglobin was less than 8 g/dL in 11 [22%] of patients and albumin of less than 3.5 g/dL was seen in 12 [24%] of cases. Azotemia as defined as a Blood Urea of > 52 mg/dL and/or Serum Creatinine > 2 mg/dL was seen in 10 [20%] of patients. Blood cultures were done in 30 patients and growth was obtained in 3. *Salmonella typhi* was grown in all 3 patients. The typhoid growths were sensitive to cefotaxime, ceftriaxone, piperacillin and amikacin. Peritoneal fluid culture was done in all patients and cultures obtained in 13. In that 6 patients grew *E. coli* and *Klebsiella spp.* each. Widal test was positive in 22 patients out of 40 tested [55%]. Pathological examination of either resected specimens or scrapings from the edge of the ulcer was done in 6 patients. A report suggestive of typhoid was seen in 4 cases. A diagnosis of tuberculosis was made in 2 cases and the rest showed features of non-specific inflammation with no conclusive diagnosis. In our study lag period was between 12 hours and 100 hours with an average of 57.46. There was no significant difference in the mean lag periods of patients of typhoid or non-specific perforations.

Table 2: Lag Period

Lag period (hours)	Total	Typhoid	Non specific	Tb	Meckels
<24	11	7	3	1	0
25-48	16	8	5	2	1
49-72	14	6	7	1	0
>72	10	6	4	0	0
	51	27	19	4	1

Multiple perforations occurred in 27% of patients, mostly in typhoid perforations. Over 96% of perforations were within 2 feet [60 cm] from the ileocaecal junction and 84% within 30 cm.

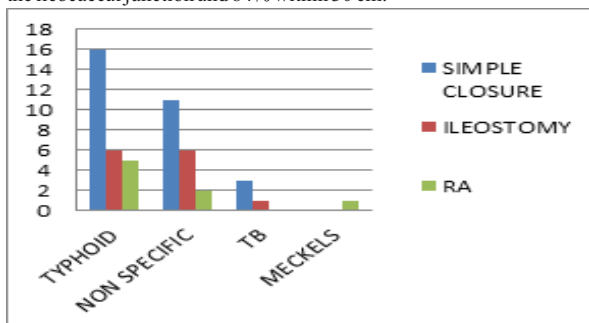


Figure 2: Surgical procedures in various etiologies.

Simple 2-layer closure was the commonest procedure done [59%]. Ileostomy in 13 [26%] and Resection and anastomosis were done in 8 [15%] patients. Resection and anastomosis took a longer time than simple closure but the difference was not statistically significant. Median hospital stay was 16 days. There was no significant difference in the hospital stay of patients undergoing different surgical procedures.

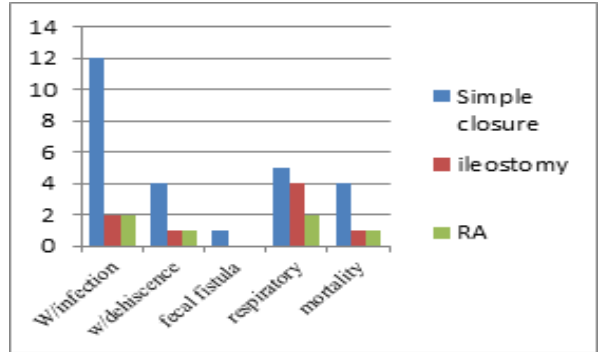


Figure 3: Surgical Procedures And Complications

The mortality rate was 15%. Mortality in patients of typhoid perforations was 11%. Non specific perforation was 10%. One patient of TB perforation expired [25%]. The differences in mortality were not found to be statistically significant.

Table 3: Causes Of Death In Ileal Perforation

Causes	Typhoid	Non specific	Tb	Total
Septicaemia	1	0	0	1[2%]
ARDS	1	2	1	3[6%]
Fecal fistula	1	0	0	1[2%]

Table 4: Risk Factors For Morbidity In Ileal Perforations

RISK FACTOR	MORBIDITY	NONE	p value
Age > 50yrs	1	0	>0.05
Female	6	4	>0.05
Male	24	17	>0.05
Shock	6	0	<0.05
Hb <8	10	1	<0.05
Alb <3.5	12	0	<0.05
Azotemia	9	1	<0.05
Multiple perforation	9	5	>0.05
Typhoid	12	15	<0.05

DISCUSSION

The commonest cause of non traumatic ileal perforation in the series was typhoid fever accounting for 53% of cases. Typhoid fever was the commonest cause of non traumatic ileal perforation in tropical countries. It accounted for 56.6% of cases of ileal perforation in the series by Karmakar.³ Mechanical causes and malignancy are the two most common cause of small bowel perforation in the western world. Mechanical causes and lymphomas accounted for 40.7% of perforations in the series by Dixon. Malignancy was the commonest cause in the series by Orringer.^{4,5} Non-specific perforations were the second commonest cause in this study accounting for 37% of cases. Non-specific perforations were the commonest cause of small bowel perforation in the series by Dixon and Bhalerao.^{4,6} TB accounted for 8% of cases of non traumatic ileal perforations in this study.

Mortality rate is 25% in our study. Wig et al reported 1 to 10% of intestinal TB undergoes perforation.⁷ It has a poor prognosis with mortality rate higher than 30% as per Kakar et al.⁸ There was a male preponderance with the male: female ratio in this study being 4.1: 1. Seven cases of typhoid perforations, two cases of non specific and one case of TB perforation were seen in females. Published literature shows a similar finding with reported ratios from 2.3:1 to 6:1.^{9,10} Typhoid perforations as reported by Eggleston occurred in the second and third decades of life. In this study 74% of typhoid, 94% of nonspecific and 75% of TB perforations were in a similar age group.⁹

Most patients presented with features suggestive of peritonitis. Patients of both typhoid and non-specific perforations had similar presentation with respect to abdominal symptoms and signs. Patients with typhoid perforation had fever, abdominal pain and vomiting.

Examination revealed tenderness, guarding, distension and intraperitoneal free fluid. 6 patients were in shock on admission. Eggleston reported that most patients had fever, malaise and sudden increase in abdominal pain in typhoid perforation.⁹ Chest X-ray is a useful investigation to detect hollow viscus perforation. Free gas was seen under the diaphragm in 56% of perforations and in 60% of typhoid perforation. Pneumoperitoneum has been reported in 52% to

82% in studies by Hadley and Archampong.^{11,12} Tuberculosis was diagnosed definitively by histopathology though sputum for AFB was done for patients with history indicating TB. Histopathology was suggestive of typhoid in three patients. The presence of erythrophagocytosis virtually confirms the diagnosis of typhoid perforation. In this study most patients of confirmed typhoid were treated with azithromycin or ceftriaxone and metronidazole. In the management of typhoid perforation some authors advocated conservative management. Presently there is no such controversy in the treatment of typhoid perforation with the current recommendation being surgical management. The various methods in use are local drains, simple closure, closure with omental patch, wedge resection, resection and anastomosis, ileotransverse anastomosis and ileostomy.^{13,14}

The overall complication rate for all patients in was 59%. Typhoid perforations are associated with a high morbidity rate with literature reports between 28.5% and 81%.^{11,15} The common complications were wound infection, wound dehiscence, fecal fistula and respiratory complication which compare with published reports.^{11,15,16} Fecal fistula was seen in only one patient.

The surgical procedure did not influence either the morbidity or the mortality in patients irrespective of etiology. Resection-anastomosis was found to have a higher complication rate but this was not statistically significant. Eggleston reported that the procedure done did not influence outcome.⁹ Talwar and Sharma reported that mortality was least with early primary closure and Ameh et al found mortality was highest with wedge resection and least with resection and anastomosis.^{17,18} Lag period has been known to influence both mortality and morbidity. Regression analysis showed that the mortality and morbidity increased with increasing lag period. This association was also found in patients of typhoid perforations. Increasing lag period was associated with increased mortality in number of series.^{9,12}

The mortality in this series was 12%. In patients of typhoid perforation the mortality was 11.1%. Though this rate has been on the decline, reported rates are between 3% and 60%. In non specific perforations two cases and in TB one case of mortality was found.^{11,15}

In patients of ileal perforation the significant factors influencing mortality are age greater than 50, female sex, feculent peritonitis, raised blood urea or creatinine as per the Mannheim peritonitis index. In this study shock at presentation and albumin <3.5g/dl were significant factors influencing mortality. Factors increasing morbidity are shock at presentation, Hb <8 gms%, albumin <3.5g/dl, azotemia and typhoid perforations. Archampong reported that urine output prior to surgery, blood urea and serum potassium affected survival in patients of typhoid perforation. Hadley et al reported survival was independent of haemoglobin level, shock, sickling status and number of perforations affected survival.^{11,12}

CONCLUSION

The present study reflects that typhoid is the most common cause of non traumatic ileal perforation, followed by non-specific perforations. Patients have a male preponderance and are usually in the second and third decades of their lives. Widal serology is a useful test in the diagnosis of typhoid fever. Histopathology is useful in the diagnosis of tubercular perforations but not very useful in the diagnosis of typhoid. Typhoid perforations have a significantly higher morbidity rate. The type of surgical procedure did not influence outcome, either morbidity or mortality. Pre operative presence of shock and hypoalbuminemia affected mortality and in addition azotemia affected morbidity of patients. Lag period significantly influenced outcome. This was true for cases of non traumatic ileal perforation irrespective of etiology and significant when typhoid perforations were separately considered.

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