



A CLINICAL STUDY OF ILEAL PERFORATION AND COMPLICATIONS

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ABSTRACT

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 etiology, in the order of frequency^{1,2,3}. 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^{4,5}.

KEYWORDS

Ileal perforation, Etiology, Surgical management, typhoid and Traumatic perforations.

INTRODUCTION :

Ileum being distal part of small intestine forms common content of hernia (enterocele), diseases like infections (nonspecific) gives rise to edema and initiation of ileo caecal infection as in infants and specific infections like tuberculosis presenting as ileocaecal tuberculosis and mass presents both as acute and chronic intestinal obstruction. Typhoid presenting as acute surgical emergency. Its involvement mainly in Crohn's disease is so common for some time the disease was referred as regional ileitis.

In the lower abdominal trauma ileum is the common hollow viscus involved. Typhoid is still endemic here and typhoid ileal perforation is a very serious complication. Even if diagnosed early and treated operatively the mortality rate is high particularly due to toxemia and myocarditis.

This study is based on the clinical study of ileal perforations studied for the last three years in Government General Hospital, Kurnool. An endeavour is made to ascertain the possible causes, the clinical presentations, diagnostic procedures, and the most satisfactory treatment for various types of perforations and the ultimate prognosis. The present study includes 100 patients of ileal perforation with emphasis on typhoid, nonspecific and traumatic perforations and the factors influencing outcome.

METHODOLOGY :

This study consists of 100 patients admitted with ileal perforation to Government General Hospital Kurnool. This study was focused on clinical features, investigations, operative procedures performed, postoperative morbidity and mortality and outcome. Jejunal, caecal, appendicular, gastric or duodenal perforations were excluded from the study. History with special reference to presence of fever, pain, vomiting, abdominal distension, constipation and treatment prior to admission was taken. Vital signs, hydration, abdominal distension, tenderness, guarding and presence of free fluid were noted. Systemic examination of cardiovascular, respiratory and central nervous system was done.

The following investigations were done as a routine

- Hemoglobin
- Bleeding and Clotting times
- Blood sugar and urea and Serum creatinine

- Chest X-Ray
- Electrocardiogram
- Pus culture in case of wound infection

In patients where in a resection was done the specimen was histopathologically examined. In all non-traumatic perforations the following additional investigations were done

- Widal test
- Blood Culture

All patients were resuscitated preoperatively with intravenous fluids and antibiotics. Patients unfit for surgery were initially treated with flank drains under local anaesthesia as a temporary measure prior to definitive laparotomy. Most cases received cefotaxime or ciprofloxacin with metronidazole. In case of gross peritoneal contamination aminoglycosides were added. All patients underwent laparotomy under general anaesthesia. Midline or Para median incisions were employed. The amount and type of peritoneal contamination, number, site and size of perforations and procedure employed were noted. The following procedures were employed.

- Simple two layer closure
- Closure with free or pedicled omental patch
- Resection and anastomosis

For both closure and anastomosis, the inner all-coats layer and the outer layer was performed with 2.0 silk. Antibiotics were routinely given for 5-7 days unless the diagnosis was typhoid in which case antibiotics were continued for up to 10 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.

The various parameters were recorded in a proforma and tabulated.

RESULTS:

Hundred patients of Ileal Perforation admitted in our institute were included in this study. Patients have been grouped into

etiologiical categories, namely, typhoid, non-specific, trauma and miscellaneous.

Table 1: Etiology of Ileal Perforation

Diagnosis	Cases	Percent
Typhoid	48	48
Nonspecific	30	30
With h/o fever	12	
Without h/o fever	18	
Trauma	20	20
Tuberculosis	2	2
Total	100	100

Table 2: Age and Sex incidence in Ileal Perforation

Age	Male	Female	Total	Percent
10-20	3	0	3	3
20-30	29	8	37	37
30-40	19	7	26	26
40-50	18	2	20	20
50-60	7	2	9	9
60-70	3	0	3	3
70-80	0	1	1	1
80-90	1	0	1	1
Total	80	20	100	100

Table 8: Surgical Procedures and their Complications

Complications	Simple Closure n = 70 (%)	Omental Patch n = 20 (%)	Resection Anastomosis n = 10 (%)	Total n = 100
Wound Infection	20 (28)	8 (40)	5 (50)	33 (33)
Wound Dehiscence	20(28)	7 (35)	1 (10)	28 (28)
Abd. Collection	7 (10)	7 (35)	2 (20)	16 (16)
Fecal Fistula	7(10)	8 (40)	3 (30)	18 (18)
Reperforation	6(8)	2 (10)	2 (20)	10 (10)
Respiratory	17 (24)	2 (10)	2 (20)	21 (21)
Mortality	11 (16)	2 (10)	2 (20)	15(15)

Figure: 1- Etiology of Ileal Perforation

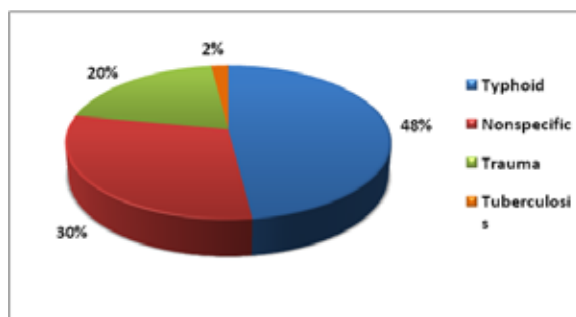
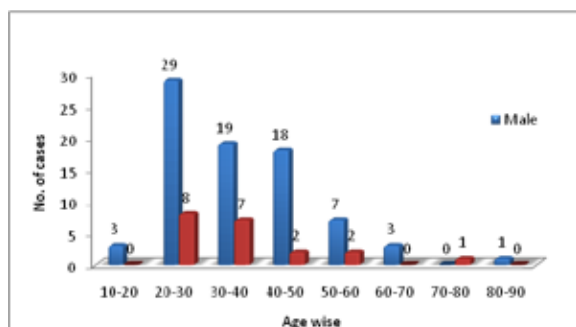


Figure: 2 - Age and Sex incidence in Ileal Perforation



DISCUSSION

The commonest cause of ileal perforation in the series was typhoid fever accounting for 48% of cases. Typhoid fever was the commonest cause of ileal perforation in tropical countries. Typhoid fever accounted for 56.6% of cases of ileal perforation in the series by Karmakar¹. Mechanical causes and malignancy are the commonest causes of small bowel perforation in the western world. Mechanical causes and lymphomas accounted for 40.7% of perforations in the series by Dixon². Malignancy was the commonest cause in the series by Orringer³. There were no cases of typhoid perforations in either series^{2,3}.

When the etiology of the perforation was not identified it was termed non-specific perforation. Non-specific perforation was the second commonest cause in this study accounting for 30% of cases. 12 patients of non-specific perforation had fever prior to onset of abdominal symptoms. These cases may be undiagnosed cases of typhoid. Non-specific perforations were the commonest cause of small bowel perforation in the series by Dixon and Bhalerao²⁴. Trauma accounted for 20% of cases of ileal perforation in this series. 8.25% of ileal perforations published by Karmakar were due to trauma¹.

There was a male preponderance with the male: female ratio in this study being 4:1. This preponderance was seen in typhoid, non-specific and traumatic perforations. Published literature also shows a similar finding with reported ratios from 2.3:1 to 6.1:1^{5,6,7,8,9,10,11,12}.

Most patients presented with features suggestive of peritonitis. Patients with typhoid perforation had fever, abdominal pain and vomiting. Examination revealed tenderness, guarding, distension and intraperitoneal free fluid. 13 patients were in shock on admission.

Examination revealed signs of toxemia and acute abdomen¹³. Gibney and Gulati reported pneumonia, cholecystitis, gastrointestinal bleed, osteomyelitis and intestinal perforation in patients with typhoid perforation^{14,15}. Perforation was commonly seen to occur in the second week following onset of illness^{7,11,12,16}. Keenan reported that 88% of patients perforated in the second week¹⁶.

Chest X-ray is a useful investigation to detect hollow viscus perforation. Free gas was seen under the diaphragm in 78% of perforations and in 75% of typhoid perforation. Abdominal X-ray revealed gas and features suggestive of ileus. Pneumoperitoneum has been reported in 52% to 82% in studies by Hadley, Archampong, Tacylidiz and Vaidyanathan^{9,16,17,18}.

Widal was positive in 55% of tested cases and in 86% of patients of typhoid perforation. It was reported positive in 75.5% of cases by Jarrett and in 73% by Vaidyanathan^{18,29}. Four-fold increase in titres is considered more significant²⁰. Salmonella typhi was grown in 10% of tested patients with ileal perforation in whom blood cultures were done. Tuberculosis was diagnosed definitively by histopathology. Histopathology was suggestive of typhoid 20% of tested patients. The presence of erythrophagocytosis virtually confirms the diagnosis of typhoid perforation²¹.

In the management of typhoid perforation some authors advocated conservative management^{22,,23,24}. Presently there is no such controversy in the treatment of typhoid perforation with the current recommendation being surgical management²⁵. The various methods in use are local drains, simple closure, closure with omental patch, wedge resection, resection and anastomosis, ileotransverse anastomosis and ileostomy^{12,14,26,27,28,29}. Resection was employed in typhoid or traumatic perforations wherein multiple perforations were found on laparotomy. Orloff recommended debridement and closure in patients of traumatic perforation where the injury was small and resection anastomosis in patients with large wounds or multiple perforations³⁰.

The overall complication rate for all patients in this series was 64%. Typhoid perforations are associated with a high morbidity rate with literature reports between 28.5% and 81%^{7,9,11,13,16}. The common complications were wound infection, wound dehiscence, fecal fistula and respiratory complication which compare with published reports^{7,8,10,16}. Fecal fistula was seen in 25% of these patients. Literature reports a rate of between 3% and 10%^{7,8,16}. The mortality rate of patients with fistula is improved with total parenteral nutrition and better antibiotic cover.

Patients with traumatic perforations had lesser complications presumably due to a healthier bowel than those patients with typhoid or non-specific perforations. In patients of traumatic perforations outcome is primarily influenced by injury to other organs³⁰. The mortality in this series was 15%. In patients of typhoid perforation the mortality was 18.75%.

The surgical procedure did not influence either the morbidity or the mortality in patients irrespective of etiology. Simple closure was found to have a higher complication rate. Eggleston reported that the procedure done did not influence outcome¹³. 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^{28,29}.

Lag period has been known to influence both mortality and morbidity. 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 age greater than 50 and shock at presentation were significant factors influencing mortality. Trends were seen with fecal fistula formations, etiology of typhoid and preoperative azotemia. Sex, hemoglobin or albumin levels, number of perforations and type of peritoneal contamination were not found to be significant.

Archampong reported that urine output prior to surgery, blood urea and serum potassium, affected survival in patients of typhoid perforation. Survival was independent of hemoglobin level, shock, sickling status and number of perforations¹⁹. Mock reported that increasing number of perforations, generalised contamination of the peritoneal cavity and single layer closure influenced survival⁸. Eggleston in his series of 78 patients reported the shock, uremia, encephalopathy, fecal peritonitis and postoperative fecal fistula were predictors of mortality¹³.

SUMMARY :

A total of 100 cases of ileal perforation were studied in this series. The most common etiology was typhoid followed by trauma and non specific causes. 2 cases were due to intestinal tuberculosis were also studied. All were emergency admissions and constituted 6.7 percent of all emergencies

No cases of perforation due to ascariasis, amoebiasis, intestinal tumour were noted in this series. The choice of treatment in this series was simple closure in two layers with drainage which was associated with least mortality of 20.37 percent. Conservative treatment which was practiced in moribund condition was associated with higher mortality of 80%. In traumatic ileal perforation again simple closure with drainage was practiced but mortality was high in these cases because of associated injuries and hemorrhagic shock at the time of presentation. In perforation of intestinal tuberculosis simple closure of perforation with ileo transverse anastomosis was practiced.

Even though etiology plays a part, most important parameter of prognosis is interval between perforation and operative treatment. Shorter intervals was associated with best recovery. The most common cause of death in typhoid ileal perforation was toxemia & MODF. Complications of surgery played the least part.

The aim of the treatment in ileal perforation was to prevent mortality and save life accepting some morbidity. This was achieved by operative treatment. Conservative treatment was used only in very moribund condition as a last resort. A good post operative care with IV fluids and antibiotics was essential. Intestinal fistulae developed post operatively were managed conservatively and in the majority of cases recovered spontaneously.

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