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General Surgery

A CLINICAL STUDY OF ILEAL PERFORATION AND COMPLICATIONS IN TERTIARY CARE HOSPITAL IN RAYALASEEMA REGION

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KEYWORDS :

INTRODUCTION

Ileal perforation is a common problem seen in tropical countries. The commonest cause being typhoid fever in India. 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. 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 toxaemia and myocarditis. Conservative treatment in these cases is associated with very high mortality. The present study is a prospective study includes 50 patients of ileal perforation with emphasis on typhoid, nonspecific ,traumatic and tubercular perforations and the factors influencing outcome.

AIMS AND OBJECTIVES

- To study the age and sex incidences in patients with ileal perforation.
- To study presenting signs and symptoms of ileal perforation of different etiologies.
- To study the cause, relation between preoperative biochemical and serological investigations to the outcome in these patients.
- To study the outcome of different surgical procedures of these patients.
- To study the postoperative complications and the factors influencing the outcome in these patients.

METHODOLOGY

SOURCE OF DATA:

The study was conducted in Government General Hospital, kurnool, fromNovember 2015 to November 2017. Total numbers of cases studied are 50. This is a prospective observational study conducted over a period of 2 years. A study of clinical features, investigations, operative procedures performed, postoperative morbidity and mortality and outcome was done.

METHOD OF COLLECTION OF DATA:

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.All patients were resuscitated preoperatively with intravenous fluids ,Nasogastric decompression of stomach,Urinary catheterization for urine output monitoring 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.

The following investigations were done as a routine ,Complete blood picture, Bleeding and Clotting times, Blood sugar , urea and Serum Creatinine, Chest X-Ray & X –Ray Erect abdomen, Ultrasound Abdomen& pelvis, Electrocardiogram, Pus culture in case of wound infection.In patients where in a resection was done the specimen was histopathologically examined. In non-traumatic perforations the following additional investigations like Widal test&Blood Culturewere done.

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.1)Simple two layer closure 2)Closure with free or pedicled omental patch 3)Resection and Anastomosis 4)Primary suturing and Proximal ileostomty. For both closure and anastomosis, the inner all-coats layer and the outer layer was performed with 2.0 silk. All patients had peritoneal lavage with copious volumes of Normal Saline. All had mass closure of Abdominal wound with No.1 Prolene with intraabdominal drain left insitu. 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.

INCLUSION CRITERIA: All patients of age 14 years and above with who were presented with features of peritonitis and later found to have ileal perforation were taken .

EXCLUSION CRITERIA: Perforations in bowel other than ileum like Jejunal, caecal, appendicular, gastric or duodenal perforations were excluded .

OBSERVATIONS AND RESULTS

Etiology of Ileal Perforation in present study

Diagnosis	Cases	Percent
Typhoid	23	46
Nonspecific	17	34
With h/o fever	6	
Without h/o fever	11	
Trauma	8	16
Tuberculosis	2	4
Total	50	100

Symptoms and Signs in Typhoid, Non Specific, Trauma and

Symptoms	Typhoid n=23	Non specific n=17	Trauma n=8	Tuberculosis n=2
Abdominal Pain	23	17	8	2
Fever	20	6	2	2
Vomiting	18	8	5	0
Constipation	9	9	3	0
Diarrhea	4	0	0	0
Signs				
Dehydration	18	8	7	2
Tenderness	23	17	8	2
Guarding	18	12	8	0
Distention	16	8	2	0
Free Fluid	18	8	4	1
Shock	3	2	2	0
Jaundice	4	0	0	0

INVESTIGATIONS

X-Ray: Pneumoperitoneum in chest and erect abdominal x-ray was seen in 78%(39) of patients. Features of intestinal obstruction, including dilated bowel loops with air-fluid levels in erect abdominal x-ray were seen 24% of patients.

Ultrasonography Abdomen and pelvis: Free fluid noted in 31(62%) of patients. Dialated bowel loops noted in 12(24%) of patients.

Haematology and Biochemistry: Haemoglobin was <8 g/dL in 15 (30%) of patients and Albumin of < 3.5 g/dL was seen in 11 (22%) of cases. Azotemia as defined as a Blood Urea of > 52 mg/dL andSerum Creatinine > 2 mg/dL was seen in 40% (20) .WBC count elevated(>11,000x10^9/Litre) in 78%(39) of patients.

Microbiology: Blood cultures were done in 30 patients and growth was obtained in 10. Salmonella typhi was grown in 8 patients and pseudomonas in two. The typhoid growths were sensitive to ciprofloxacin, cefotaxime, ceftriaxone and amikacin. Widal test was positive in 15 patients out of 32 tested.

Lag Period It is the time between the onset of pain and the surgical intervention .

Surgical Procedures and their Complicationsin present study

Procedure	Ileal	%	Typhoid	%	Nonspecific	%	Trauma	%	Tb	%
Two layer Closure	30	60	14	60.8	10	58.8	6	75	0	0
Omental Patch	8	16	4	17.3	3	17.6	1	12	0	0
Resection/ Anastomosis	7	14	3	13	2	11.7	1	12.5	1	50
Primary suturing & ileostomy	5	10	2	8.6	2	11.7	0	0	1	50
Total	50	100	23	100	17	100	8	100	2	100

Complications	S.C n =30(%)	O.P n =8(%)	R&A. n=7(%)	P.S& P.I n=5(%)	Total n = 50
Wound Infection	15 (50)	4 (50)	3 (42.8)	4 (80)	26 (52)
Wound Dehiscence	4(13.3)	3 (37.5)	1 (14.2)	1 (20)	9 (18)
Abd. Collection	5 (16.6)	3 (37.5)	2 (28.5)	3 (60)	13 (26)
Fecal Fistula	3(10)	2 (25)	1 (14.2)	0	6 (12)
Reperforation	2(6.6)	1(12.5)	1 (14.2)	0	4 (8)
Respiratory	12 (40)	2 (25)	1 (14.2)	2 (40)	17 (34)
Acute hepatic Failure	1(3.3)	0	1 (14.2)	0	2 (4)
Mortality	3(10)	1(12.5)	3 (42.8)	0	7(14)

Cause of Death in Ileal Perforationin present study

Cause	Typhoid n = 4	Non Specific n = 2	Trauma n = 0	Tb n=1	Total n = 7 (%)
Fecal fistula	3	1	-	-	4 (57.14)
Anastomotic Leak	2	1	-	-	3 (42.85)
Reperforation	-	-	-	-	-
Indeterminate	1	-	-	-	1 (14.28)
Septicemia	-	1	-	1	2 (28.57)
CVS/RS	1	-	-	-	1 (14.2)

Risk Factors for Mortality in present study

Risk Factor	Mortality n = 7	Survivors n = 43
Age > 50	4	7
Female sex	2	8
Male sex	5	35
Shock	3	4
Hb<8	5	8
Alb <3.5	3	8
Azotemia	5	15
Multiple perforation	1	8
Fecal Peritonitis	5	10
Fecal Fistula	4	2
Typhoid	4	21

DISCUSSION

The commonest cause of ileal perforation in the series was typhoid fever accounting for 46%(23) of cases diagnosed based on antigen detection or histological confirmation. Even in non specific cases there was history of fever in 6 cases in which the cause may be undiagnosed enteric,if these cases are also taken into consideration, entericetiology accounts for 58% of cases. Typhoid fever was the commonest cause of ileal perforation in tropical countries. Typhoid fever, a severe febrile infectious disease caused primarily by Salmonella typhi occurs in areas where poor socioeconomic levels and unsanitary environmental conditions prevail.

India is the country with the highest burden of TB. The World Health Organisation (WHO) TB statistics for India for 2016 give an estimated incidence figure of 2.79 million cases of TB for India. Abdominal Tuberculosis with an acute abdomen presents as an enormous challenge to the surgeon. clinical judgment and surgical acumen to determine the extent of surgical management in an unprepared compromised patient in the emergency setting is needed. The initial clinical presentations are nonspecific. The surgeon has to collect sufficient pathological tissuefor histopathology and microbiology to overcome the diagnostic dilemma. Bacterial culture and tissue histopathology though confirmatory are time consuming, and immunological tests are expensive. A high index of suspicion for intestinal tuberculosis is needed in patients who are on immunosuppression[4]. Pain abdomen seen in 100%patients ,also shown in studies of khalidS et al[5]

COMPARISION OF SYMPTOMS WITH OTHER STUDY

S.No.	Symptoms	Meier et.al[6]	Present Study
1	Fever	93%	60%
2	Abdominal pain	90%	100%
3	Vomiting	67%	62%
4	Diarrhea	27%	8%
5	Constipation	24%	42
6	Abdominal distension	73%	52%

INVESTIGATIONS

Chest X-ray& Abdominal xray 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. Although Ultrasound abdomen and pelvis is not the first line investigation of choice in suspected small bowel perforation. It may be useful in some cases of Nonspecific perforation and Tuberculous perforation, to shorten the time to diagnose and ultimate surgical management. In our study free fluid noted in 62%(31) of cases and dilated bowel loops noted in 24%(12) of cases.

As serological and bacteriological investigations usually take one to three days for the result to be available our policy has been to begin vigorous resuscitation and upon patient's stabilization proceed to exploratory laparotomy utilizing serological and bacteriological studies as a 'post facto' aid to subsequent management rather than an augment for delaying operative intervention.

Widal test was done preoperatively only when there was a high index of suspicion of typhoid fever otherwise it was done postoperatively after typical findings were noted.An increase in titer of agglutinins against the somatic(O) and flagellar(H) antigens of S typhi occurs (basis for Widal test).Widal was positive in 46.8% of tested cases and in 65.21% of patients of typhoid perforation. Widal was reported positive in 30% of patients with typhoid perforation by Kaul and in 46.1% of patients by Santillana[7] Four-fold increase in titres is considered more significant[8].Salmonella typhi was grown in 16% of tested patients with ileal perforation in whom blood cultures were done. Hadley reported positive cultures in 22.2% and Santillana in 48% of patients[7].

Tuberculosis was diagnosed definitively by histopathology. Histopathology was suggestive of typhoid 33% of tested patients. The presence of erythrophagocytosis virtually confirms the diagnosis of typhoid perforation[9].

TREATMENT

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[10].In tuberculosis cases were treated with anti-tubercular therapy.

. In this study patients underwent simple closure, omental patch repair , resection with primary anastomosis and primary suturing with proximal ileostomy . No patients were treated by conservative measures.

In the present study total typhoid cases were 23 in that simple one or two layer closure done in 60.8% (14) of patients in that one patient died with respiratory complications. In four patients omental patch closure done in that one patient died with fecal fistula .In three patients Resection and primary anastomosis done in that two had died with complication of faecal fistula. In patients of typhoid perforation the morality was 17.39%. Though this rate has been on the decline, reported rates are between 3% and 60%. Typhoid perforations in this study thus showed a poorer prognosis than the other etiologies.

In the present study total Nonspecific perforations were 17 in that simple one or two layer closure done. one patient died with complication of faecal fistula and another died with septicaemia. In three patients omental patch closure done .In two patients Resection and primary anastomosis done .In two patients primary suturing and proximal ileostomy done. In non specific perforations the mortality was 11.76%.

In the present study total traumatic perforations were 8 in that simple one or two layer closure done in 6 patients . In one patient omental patch closure done and in another one Resection and primary anastomosis done 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 in primarily influenced by injury to other organs.
In the present study total tuberculous perforations were 2 in that one had a structure just distal to their perforation , two had tubercles studded on the mesentery and the surface of the bowel along with the large perforation.In the first case resection and primary anastomosis done but the patient died with septicaemia on second post operative day. In the second case primary closure with proximal ileostomy done .

The operative procedures performed and their mortality rates are as follows, patients who had simple two layer closure of their perforations 30(60%), had a mortality of 10%.In eight patients Omental patch closure done with mortality of 12.5%(1). Seven patients (21%) had resection and primary anastomosis. These either had multiple perforations which were close or a large single perforation, (here, simple closure would have led to ileal stenosis) orsevere tension through inflammation of the diseased ileal segment.This group in the present study had a high mortality of 42.8%(3). Five (10%) of thepatients had primary suture with proximal ileostomy. This was done in patients in whom it was thought necessary to create a defunction the site of primary suture, because of doubtful viability of the ileum at the site of primary suturing of the perforation.

COMPARISIONOF POSTOPERATIVE COMPLICATIONS WITH OTHER STUDY

S.No.	Complications	Santillana[7]	Present Study
1	Wound Infection	40.6%	52%
2	Fecal Fistula	2.1%	12%
3	Reperforation	0.7%	8%
4	Respiratory Complications	0.7%	34%
5	Icterus	2.1%	4%

The surgical procedure did not influence either the morbidity or the mortality in patients irrespective of etiology. Eggleston reported that the procedure done did not influence outcome[11]. Lag period has been known to influence both mortality and morbidity.

OUTCOME

In the present study showed an overall mortality rate of 14% .Dickson et al.[12]reported a mortality rate of 58% for typhoid perforation in Nigeria forty six years ago. The improved figures in mortality rates may be due to improved methods of resuscitation, availability of more potent broad-spectrum antibiotics as well as use of more modern anaesthesia and post-operative care, within the last decade. The mortality rates are also related to a number of factors viz, earlypresentation following onset of peritonitis and therefore had short duration of resuscitation before operative intervention and had minimal or moderate degrees of peritonitis and peritoneal soiling. Secondly the advanced pathological changes like multiple perforations, severely diseased segments of the ileum, the phlegmonous changes in the caecum and ascending colon, as well as extensive peritoneal faecal soiling that had taken place because of late presentation necessitated more extensive and time consuming surgery like Resection with Anastomosis and primary suturing with proximal ileostomy. The causes of mortality in the present studyincluded peritonitis leading to severe endotoxaemia and multiple organ failure, in 2 patients and faecal fistula resulting in fluid and electrolyte disturbances and severe malnutrition in 3 patients. All deaths occurred in the early post-operativeperiod. For those that survived, morbidity rates were equally high with wound infection topping the list as 52.0%, wound dehiscence at 18%, residual intra-abdominal collection at 26%, cardiopulmonary complications at 34%, and faecal fistula at 12%.The present study findings are similar to finding elsewhere in West Africa.[13]Out of the 43 (86%) patients who survived, 26(60.46%) had one or more morbidities.

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, haemoglobin or albumin levels, number of perforations and type of peritoneal contamination were not found to be significant.

SUMMARY AND CONCLUSIONS

This prospective clinical study was conducted from November 2015 to November2017. It includes 50 cases of ileal perforation admitted to Government General Hospital, Kurnool in that period. Etiology, presentation, management and outcome of patients with ileal perforations were studied with emphasis on typhoid, non-specific, traumatic and tubercular perforations and the factors that influenced the prognosis.

- Typhoid is the most common cause of 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.
- Chest X-ray is a useful investigation to detect hollow viscus perforation.
- Abdomino-pelvic ultrasound were usually helpful as it shows free peritoneal fluid suggestive of peritonitis in atypical presentations.
- Tuberculosis was diagnosed definitively by histopathology.
- Typhoid perforations have a significantly higher morbidity rate than non-specific and traumatic perforations.
- Mortality in ileal perforations, especially in typhoid it is high, though the etiology is not a significant contributing factor.
- Traumatic perforations have a good outcome.

It is therefore now accepted widely that the treatment of ileal perforation should be surgical& no role of conservative management.

- The type of surgical procedure did not influence outcome, either morbidity or mortality.
- In the absence of facilities for total parenteral nutrition, fecal fistulae should be surgically closed early with Resection and Anastomosis or bypass.
- Lag period significantly influenced outcome. This was true for cases of ileal perforation irrespective of etiology and significant when typhoid perforations were separately considered.The mortality and morbidity increased with increasing lag period.
- The improved figures in mortality rates may be due to improved methods of resuscitation, availability of more potent broad-spectrum antibiotics as well as use of more modern anaesthesia and post-operative care, within the last decade.Mortality was significantly influenced by age greater than 50 and shock on admission.

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