

A Study of Observation and Modalities of Management of Intestinal Perforation**Dushmanta Kumar Sethi¹, Gopal Krishna Nayak², Satyajit Samal³, Nirod Kumar Sahoo⁴**¹Assistant Professor, Department of General Surgery, MKCG Medical College & Hospital, Berhampur, Odisha, India.²Assistant Professor, Department of Anaesthesiology & Critical Care, SLN Medical College, Koraput, Odisha, India³Associate Professor, Department of Urology, SCB Medical College & Hospital, Cuttack, Odisha, India⁴Assistant Professor, Department of General Surgery, MKCG Medical College & Hospital, Berhampur, Odisha, India

Received: 25-03-2024 / Revised: 23-04-2024 / Accepted: 26-05-2024

Corresponding Author: Dr. Nirod Kumar Sahoo

Conflict of interest: Nil

Abstract:

Background: The abdominal emergency particularly those due to intestinal perforation has remained a great challenge to the surgeon from the time of immemorial. The fluctuating clinical course associating with its poor prognosis in these cases are due to late presentation because of poverty, illiteracy and ill planned management of local quacks. The intestinal perforation, a common occurrence this part of the country, is associated with peritonitis and requires emergency surgical management. The exact underlying cause of perforation is difficult to ascertain preoperative and even in post-operative in some cases. Taking all these factors into consideration, the present study is under taken to evaluate the different anatomical location of the perforation, age, sex, effect of seasonal variation and in end to assess to the different operative modalities of management for better outcome in these patients.

Aim and Objective: The aim of this study is to observation and modalities of management of intestinal perforation. The following parameters were evaluated for Intestinal perforation: 1. Patient selection. 2. Operative technique. 3. Complication, 4. Outcome. 5. Follow up

Patients and Methods: This study on aetiological observation on intestinal perforation and its management was carried out in M K C G Medical College hospital, Berhampur from January 2023 to December 2023. The patients who were admitted to the indoor surgical wards with the diagnosis of acute abdomen were taken as material and the detail clinical study, investigation as necessary, pre-operative and operative finding were recorded in a preformed proforma, after taking proper consent and those patients who came out to intestinal perforation were studied and the patient with gastric and duodenal perforation were excluded from the study.

Results: In this study there were 450 cases of acute abdomen with different aetiology and out of all 380 cases underwent Laparotomy. 50 were conservatively treated in standard method because they were not suitable or fit for operation. Out of these 50 patients 35 patients recovered and 15 patients expired. Another 20 patients left the hospital of their own accord. The incidence was higher during the rainy season. The commonest organism isolated in the peritoneal fluid was E.Coli 70%. In this study trauma was most common cause of intestinal perforation accounting for 40%. In 78% of cases ileostomy and simple closure of the perforation was done. In Laparotomy, free fluid in the peritoneum was seen in all cases and free gas in the peritoneum was seen in 46 cases (92%). All case of traumatic perforation was treated with simple closure.

Conclusion: Intestinal perforation is one of the most dangerous abdominal catastrophes. It has delayed presentation and difficult pre-operative diagnosis. The post-operative period is usually stormy and full of complications with a high mortality. Hence, we conclude that after appropriate pre-operative resuscitation, all cases of acute abdomen with provisional diagnosis of intestinal perforation must be opened as early as possible to settle the diagnosis to prevent the continued pouring out of intestinal contents in the peritoneal cavity, to limit the septicaemia and to undergo appropriate surgical procedures so as to reduce the ultimate mortality and morbidity. The golden principles of these case of acute abdomen coming with severe toxemia fall back it the aphorism. It is better to look and see then wait and see.

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

The abdominal emergency particularly those due to intestinal perforation has remained a great challenge to the surgeon from the time of immemorial. The fluctuating clinical course associating with its poor prognosis in these cases are due to late presentation because of poverty, illiteracy and ill planned management of local quacks. The intestinal perforation, a common occurrence this part of the country, is associated with peritonitis and requires emergency surgical management. The exact underlying cause of perforation is difficult to ascertain preoperative and even in post-operative in some cases.

The cause of this catastrophic condition has been a subject of considerable speculation and several aetiological factors have been recorded in literatures from different regions of the world. The various aetiological factors vary from perforation due to complication of pathological states such as enteric fever, malignancy, Crohn's etc., perforation due to trauma like external violence to the abdomen or faulty instrumentation and to spontaneous rupture. Typhoid, tuberculosis, amoebiasis and round worms constitute. The most frequent causes and though the aetiological pattern has changed in West as reported by Huttumet et al [1] (1977). Typhoid and tuberculosis still continue to be important causes of peritonitis in the developing countries like India. With the increasing automobile and industrial accident, the incidence of blunt and penetrating abdominal injury leading to trauma to solid hollow viscera are increasing in incidents (Counsellor and Mc. Cormere 1935) [2]

Perforation of intestine may be due to any aetiology but leads to perforation due to fulminating dangerous coliform organisms. The onset of symptoms varies between 5hrs to 12 hrs. The patients with blunt abdominal trauma leading to perforation either remain asymptomatic or have very few symptoms during the first 6 hours for which it is always advisable to admit and observe all patients with abdominal injury. Independent of its aetiology, all the cases of perforation of intestine have similar symptoms and signs for which the condition studied as a single entity.

For the diagnosis of this condition many investigations have been formulated like straight X-ray of abdomen in erect posture to detect gas under the dome of the diaphragm, ultrasound, serum amylase. Subsequently needle aspiration of abdomen in suprapubic region in head raised position, yields the liberation intestinal content and helps the diagnosis in about 90% of cases. But the specific pre-operative diagnosis is quite difficult in all cases and no time should be wasted in arriving at the diagnosis. Laparotomy is the ultimate diagnosis procedure which gives the positive

aetiological diagnosis, definite site of perforation and final treatment. Early operative management is mandatory and "wait and watch" policy should not be followed. Looking into the statistic of mortality and morbidity of intestinal perforation from interference show a significantly higher level. Hall and Angles 1979 [3], has recorded mortality rate of 33%, which was due to difficulty and delay in reaching diagnosis. Dickson and Cole [4] recorded 56% mortality in a total of 38 cases. Basing upon fact, various methods were under taken for early diagnosis in approaching the treatment to decrease the morbidity and mortality.

Taking all these factors into consideration, the present study is under taken to evaluate the different anatomical location of the perforation, age, sex, effect of seasonal variation and in end to assess to the different operative modalities of management for better outcome in these patients.

Aim and Objective of the Study: The aim of this study is to Observation and modalities of management of intestinal perforation.

The following parameters were evaluated for Intestinal perforation.

1. Patient selection
2. Operative technique
3. Complication
4. Outcome
5. Follow up

Materials & Methods

This study on aetiological observation on intestinal perforation and its management was carried out in M K C G Medical College hospital, Berhampur from January 2023 to December 2023.

The patients who were admitted to the indoor surgical wards with the diagnosis of acute abdomen were taken as material and the detail clinical study, investigation as necessary, pre-operative and operative finding were recorded in a preformed proforma, after taking proper consent and those patients who came out to intestinal perforation were studied and the patient with gastric and duodenal perforation were excluded from the study.

After all investigations patients were under gone Laparotomy, to establish the definitive diagnosis. Appropriate surgical procedure was under taken. The biopsy specimen was taken from the site of perforation, and the corresponding draining lymph-nodes were sent for histo-pathological study to conclude the diagnosis.

Results and Data Analysis:

The present study was carried out in M K C G Medical College hospital, Berhampur from January

2023 to December 2023. The patient of intestinal perforation admitted to indoor of this hospital was taken into present study.

Table 1: Total number of cases

No. of acute abdomen	No. of cases laparotomy done	No. of cases treated conservatively with recovery	No. of cases treated Conservatively with death	No. of cases Discharged otherwise
450	380	35	15	20

In this study there were 450 cases of acute abdomen with different aetiology and out of all 380 cases underwent Laparotomy. 50 were conservatively treated in standard method because they were not suitable or fit for operation. Out of these 50 patients 35 patients recovered and 15 patients expired. Another 20 patients left the hospital of their own accord.

Table 2: Disease Wise Incidence of Acute Abdomen Cases of 450

Name of the Disease	No. of Cases Affected	Percentage
No. of intestinal perforation	50	11.12
No. of duodenal perforation	102	22.66
No. of gastric perforation	20	4.44
No. of colonic perforation	-	-
No. of gall bladder perforation	02	0.44
Gangrenous perforation	-	-
No. of miscellaneous cases	276	61.34
Total	450	100

In this study, we observed 50 cases of intestinal perforation. It is almost 10 cases of acute abdomen admitted to this hospital. Gastric and duodenal perforation has been excluded from this series.

Table 3: Seasonal Incidence

	No. of cases	Percentage
November-February	06	12
March-June	12	24
July-October	32	64

The incidence was higher during the rainy season.

Table 4: Peritoneal TAPS Showing Different Organism

Types of organism	No. of case	Percentage
E.coli	38	70
Klebsiella	07	14
Pseudomonas	04	08
E. Coli & staphylococcus	04	08
TOTAL	50	100

The commonest organism isolated in the peritoneal fluid was E. coli 70%.

Table 5: Cause of Perforation

Name of the disease	No. of cases	Percentage
Gangrene due to internal Strangulation	02	04
Associated volvulus	01	02
Ascariasis	12	24
Typhoid	07	14
Tuberculosis	00	00
Crohn's disease	00	00
Malignancy	04	08
Non-specific	04	08
Traumatic	20	40
Total	50	100

In this study trauma was most common cause of intestinal perforation accounting for 40%.

Table 6: Number of Cases with Different Surgical Procedures

Nature of operation	No. of case	Percentage
Ileostomy	28	56
Only closure of perforation	11	22
Resection and anatomises	05	10
Only CRD drainage	04	08
Closure with bypass	02	04
Total	50	100

The different surgical procedure undertaken ranging from only CRD drainage to resection and anatomises. In 78% of cases ileostomy & simple closure of the perforation was done.

Table 7: Showing of Operative: Procedure

Causes	Total no. of cases	Ileos-tomy	No. of cases with simple closure	Resection & anatomises	Only drainage	Closure with bypass
Traumatic	20	12	08			
Ascariasis	07	02	05			
Non-specific	04	01	01		02	
Associated Volvulus	01			01		
Gangrene	02			02		
Malignancy	04			04		
Typhoid	12	06	02	04		
Total	50	21	16	11	02	

Appropriate surgical procedure was as per different aetiology and pathology. All case of traumatic perforation was treated with simple closure.

Table 8: Showing Clinical and Histopathological

Diagnosis	No. of cases clinical diagnosed	No. of cases histo- pathologically diagnosed
Typhoid	07	07
Malignancy	02	02
Ascariasis	09	08
Non-specific	06	02
Crohn's disease	-	01
Tubercular	-	04
Total	24	24

Table 9: Post-Operative Complication Diagnosis

Histopathological Diagnosis	No. of cases	Burst abdomen	Faecal fistula	Wound sepsis	Death	Toxaemia	No. of cases Smoothly recovery
Traumatic	20	-	02	07	01	01	09
Ascariasis	12	-	01	05	-	-	06
Malignancy	04	-	02	-	01	01	-
Typhoid	07	-	03	01	03	-	-
Tuberculosis	04	-	-	02	-	-	02
Crohn's disease	01	-	-	-	-	-	-
Gangrene	02	01	-	-	-	-	01
Non-specific	-	-	-	-	-	-	-
Total	50	01	09	15	05	02	18

Wound sepsis was the highest recovered complication among all the other complication.

Discussion

In this series we observed 50% of the cases in young adult i.e. from 11 to 30 years of age. Male and female ratio was 2;1 and most of the patients were in 2nd and 3rd decades of life. In the observation of enteric ileal perforation of Swadea, Trvedi, Thakkar [5] in 1979. In patient with

intestinal perforation observed that the male suffered 5 times more frequently than female and about 71% of the suffered were within the age of 11 to 30 years. Our series is in confirmation to finding of the workers mention above. The higher percentage suffering is the young adults; especially the male patients may be due to:

1) The exposure of the young male to various external agents during the process of their daily

earning life, without protected water supply, eating unhealthy contaminated food for which they suffer from gastro-intestinal tract disease and consequently perforation.

2) In this age male are more frequently exposed to traffic accidents and violence-so suffer from abdominal trauma which leads to intestinal perforation.

The seasonal distribution of small intestinal perforation was observed in this work and found to be about 80% of the total 50 cases during the period from March to October. Swadia, Trivedi and Thakkar 1979 [5] observed 78 cases out of 112 patients of their series. This high incidence of the intestinal perforation during the summer and rainy season is because of the cultivation (most laborious work of ploughing and enrooting is done during this time) and insufficient availability of food grains.

The routine and specific investigation were carried out in all 50 cases and in all cases of typhoid perforation, there was leucopenia. Widal test also gave useful information. Retrospectively in cases of enteric perforation. All patients were subjected for X-ray abdomen in erect posture and 100% of cases had free gas under the dome of right side of diaphragm and 50% had distended coils of intestine with multiple fluid levels. Ultrasound examination of abdomen and pelvis had showed distended coils of intestine with fluid in the peritoneal cavity. Positive Widal test was the positive sign for typhoid perforation which helped to start a correct co-operative management with appropriate antibiotics. The classical description of signs and symptoms of intestinal perforation as described by Osler is in confirmation to the present study. This is in concurrence to the observation made by E.O. Archampong et al [6] where he found headache, pain abdomen, tenderness, rigidity as findings. S.R. Karmakar, D.R. Trivedi, R.A. Bhalerao et al [7] in their series of 30 cases found fever in 14 cases, headache in 10 cases, abdominal pain in 11 cases before perforation, abdominal tenderness in 27 cases, fluid and electrolyte imbalance in 18 cases, bowel sound absent in 21 cases, after perforation. They also found gas under the diaphragm, distended coils intestine in plain X-ray of abdomen. In their series the average leukocyte count in typhoid cases was 7,600/cmm and for others was 12,000/cmm. The Widal test was positive in 11 out of 24 cases. The peritoneal tap was positive in 23 cases. From biopsy there was histological evidence in favour of typhoid aetiology in 50% of total typhoid cases.

In all cases four quadrants peritoneal tap was done, in 48 cases out of 50, were aspirated purulent fluid and in rest 2 cases had bilious aspirate. It was sent for culture and sensitivity. All these investigations

helped us to assess the general status of the patient and also assist the clinical finding to form a pre-operative diagnosis. The duration of perforation as recorded from symptoms has an important role in the recovery of patients. This is in accordance with E.Q. Archampong et al [6], S.R. Karmakar et al [7], S.K. Bhansali et al [8], who have advocated that proper pre-operative resuscitation, then operation which significantly reduces the mortality and morbidity.

The confirmation of perforation was established only on Laparotomy escaped of free gas was observed in 45 cases. Purulent and feculent peritonitis in all the 50 cases. E.O. Olurin et al [9] also observed Ascariasis free in the peritoneum. Peeling of the intestine with tear of the sero-muscular coat was his special observation in 10 cases, multiple perforations in 6 cases.

In the present work the aetiology of perforation could be made out on Laparotomy finding. Traumatic perforation was observed in 20 cases out of 16 cases which were due to blunt injury of abdomen and 4 cases were due to penetrating injury and the perforation was multiple. In all these 20 cases operation was done within 6 hours but there was gross contamination of the peritoneal cavity, which was because of large size of the injury, multiple injury or the patient sustained the injury with loaded intestine.

After identifying the site of 18 perforation treatment was instituted. In all traumatic cases and 12 cases with round worm only closure was sufficient. In 6 cases only drainage of peritoneal cavity was done because the site of perforation was partly sealed by loops of small intestine or the fibrinous flakes. We did not disturb the already naturally protected perforation. Resection and anastomosis was done in 5 cases having associated gangrene, volvulus, malignancy and typhoid perforation was of long duration, the ulcer margin was trimmed and closed with two layers. In all 50 cases peritoneal toilet bilateral flank drains was given. The drainage tube is kept for more than one week to drain out all the infected materials. Expecting the severe cases of typhoid perforation in all the rest 43 cases. We have used higher antibiotics like 2nd or 3rd generation cephalosporin, metronidazole I.V with maintenance of water and electrolyte balance, along with Ryle's tube aspiration. In the cases with typhoid perforation, we have given ciprofloxacin and aminoglycosides (taking urinary output into consideration) parent rally with dexamethasone to combat shock.

All these observations are in favour of surgical management of perforation rather than conservative treatment. There is multi-fold benefit by surgical intervention namely: -

- The aetiology is ascertained.
- The continuous leaking wound which evaluates the content to the peritoneal cavity is properly dealt with.
- -Already accumulated infected materials and pus within the peritoneal cavity could be drained out. E.Q. Archampong [6] in his topic of operative treatment of typhoid perforation of bowel (British Medical Journal, 1969) advocates strongly for operative intervention after proper resuscitation measures for the benefits mentioned above.

Summary

The present work carried out in the department of Surgery, M K C G Medical College hospital, Berhampur from January 2023 to December 2023. Fifty cases of intestinal perforation were studied and reached at following observation:

1. The incidence of intestinal perforation in my study is 11.12% of total intestinal disease.
2. The maximum number of patients was in the age group of 11 to 30 years (50%)
3. Male: Female ratio was found to be 2:1.
4. The incidence of intestinal perforation was higher during rainy season (64%).
5. Constant presenting symptoms were pain abdomen, abdominal distension and fever with signs of peritonitis.
6. Straight X-ray of abdomen revealed free gas under diaphragm (right side) in 100% of cases.
7. The commonest organism isolated in peritoneal tap was E. coli-70%.
8. Trauma was most common cause of intestinal perforation in our study (40%).
9. During Laparotomy free gas fluid seen in 100% of cases.
10. Ileostomy & simple closure of intestinal perforation was done in 64% of cases.

Conclusion

Intestinal perforation is one of the most dangerous abdominal catastrophes. It has delayed presentation

and difficult pre-operative diagnosis. The post-operative period is usually stormy and full of complications with a high mortality. Hence, we conclude that after appropriate pre-operative resuscitation, all cases of acute abdomen with provisional diagnosis of intestinal perforation must be opened as early as possible to settle the diagnosis to prevent the continued pouring out of intestinal contents in the peritoneal cavity, to limit the septicaemia and to undergo appropriate surgical procedures so as to reduce the ultimate mortality and morbidity. The golden principles of these case of acute abdomen coming with severe toxemia fall back to the aphorism. It is better to look and see then wait and see.

Bibliography

1. Huttunen, R. Kairalouma; M. I. Mokka, R. E. M. and Larmi T. K. I.: Non-traumatic small bowel perforation: Surgery, 81, 184-188, 1977.
2. Counseller, V. S. And Mc Cormack. C. J. Surg. 102, 365, 1935.
3. Hall, and Angles, A.: Am. Surge., 35, 130, 1969.
4. Dickson and G. J. Cole: Perforation of the terminal ileum. A review of 38 cases. Brit. J. Surg. 51, 893, 1964.
5. Swadia, P.M. Trivedi, A. M. Thakker: The problem of enteric ileal perforation. Ind. J. Surg. October-November. 644, 1979.
6. Archampong, E.Q, Typhoid ileal perforation why such mortalities? Brit. J. Surg. 63, 317, 321, 1976.
7. Marmarker SR, Triwedi DR and Shalerao RA: perforation of the terminal elium. Indian J. Of Surg. 1972, 34, 422-426.
8. Bhansali, S. K.: The challenge of abdominal tuberculosis in 340 cases. Ind. J. Surg. 40, 65-67, 1978.
9. Olurin E. O., Ajavi O. O. and Bohner S. P.: Typhoid perforations. J. R. Coli. Surg. Edinb. 1972, 17, 353-363.