



## EVALUATION OF SPECTRUM OF SMALL BOWEL PERFORATION AND IT'S MANAGEMENT

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**ABSTRACT** **BACKGROUND:** Perforation of small bowel is commonly observed problem in surgical practice. The different modes of clinical presentation of cases may be misleading in the diagnosis of its origin. It is required to know about current surgical practices for different types of perforations to manage such a case. A small effort has been done here, to know about the different modes of clinical presentation, diagnosis and types of management modalities for small bowel perforations.

**MATERIALS AND METHODS:** A prospective study of 50 patients presenting to KMCH Hospital who has been diagnosed clinically with small bowel perforation between October 2016 and October 2018 is done. The clinical data, the investigations done and the surgical procedure undertaken are recorded.

**RESULTS:** Pain abdomen was the chief symptom of all the patients, followed by Vomiting (76%), Fever (46%), and Distension (44%). Most of the patients had guarding and rigidity(84% cases) and liver dullness was obliterated(42% cases) based on which a clinical diagnosis of perforation was made. Erect abdomen X-ray showed air under diaphragm in 64% cases. Midline incision was employed in 90% of cases. Ileal perforation was found to be the most common site. Typhoid disease was found to be the most commonly encountered cause of ileal perforation. The most frequently done surgical procedure was Resection and Anastomoses in two layers. Postoperative follow up all patients was done to know about the frequently encountered postoperative complications, time of recovery, morbidity rate and mortality rate. The most commonly encountered complication in this series was found to be Wound infection which accounted for 17 cases (34%) and 3 cases has shown Wound dehiscence.

**CONCLUSION:** Pain abdomen(100%) is the most common presenting complaint in Small bowel perforation followed by vomiting, fever, abdominal distension and constipation. The investigations which are useful for diagnosing a perforation were found to be erect abdomen X-ray and USG abdomen. The most common surgical procedure employed here was Resection and anastomosis. The most common complication in this series was found to be wound infection. A Mortality rate of 10% was observed in our study.

**KEYWORDS :** Small bowel; Perforation; Management; Mortality; Morbidity

### INTRODUCTION:

One of the most common abdominal emergency encountered by a general surgeon in daily practice is small bowel perforation especially terminal ileal perforation. Western societies usually have a lower incidence of small bowel perforations except for a few areas where tuberculosis, typhoid, and parasitic infestation are found to be endemic [1]. The leading complication of typhoid is perforation which is usually seen in 3rd week and where ileum is found to be the main site of perforation [2]. A severely ill patient with perforated viscous poses a real challenge for the surgeon in all aspects like his technical skills, knowledge about the course of disease, its management and postoperative care [3]. Abdominal pain of sudden onset was the most common complaint in majority of patients. Diagnostic delay is responsible for significant morbidity and mortality in most of the cases and hence a high index of suspicion is required to diagnose perforation. The pivotal role in the management of perforation is played by Surgery. Emergence of new technologies in the recent era has been providing different surgical techniques and the most challenging experiences for a surgeon in evaluating and managing a gastrointestinal perforation. This study is done to observe the age and sex incidence, various etiological factors, different modes of clinical presentations and various types of surgical procedures for gastrointestinal perforations, its complications in our setup.

### METHODOLOGY:

This "Evaluation of spectrum of small bowel perforation and its management" has been carried out in department of surgery, Katuri medical college and hospital, Guntur. This was a prospective study of 50 patients with perforation of small bowel admitted during the period from October 2016 to October 2018. Patients aged >12 years with small bowel perforation were included in the study. Patients aged < 12

years, managed conservatively were excluded from the study. The proportions of complications (Major/All) in association with the surgical procedures and Total leucocyte count were tested with the help of Chi-square and Fisher exact test. The strength of relationship between complications occurred and the Total leucocyte count has been shown using The Odds Ratio. The significance of time duration in hospital stay in days in association with presence of complications after surgery has been found out using the Student t-test.

### RESULTS

**TABLE 1: Age Distribution with sex**

Age (years)	Male		Female		Total NO.
	NO.	%	NO.	%	
12-20	4	10.0	5	50.0	9
21-30	16	40.0	4	40.0	20
31-40	14	35.0	1	10.0	15
41-50	4	10.0	-	-	4
>50	2	5.0	-	-	2
Total	40	100.0	10	100.0	50
Mean +/- SD	32.60 +/- 10.91		22.60 +/- 6.55		30.60 +/- 10.19

The most common age group involved was found to be 20 -30 years lasting for about 40%.

**TABLE 2: PRESENTING SYMPTOMS**

Presenting Symptoms	Number	%
pain	48	96.0
vomiting	38	76.0
Distension	22	44.0

Constipation	25	50.0
Fever	23	46.0

**OBSERVATION:**

Abdominal pain was the most common symptom in all cases under study followed by vomiting (76%), fever (46 %) and abdominal distension (44%). Constipation accounted for 50% of cases.

**TABLE 3: PHYSICAL EXAMINATION**

Physical Examination	Number	%
Guarding and Rigidity	42	84
Rebound Tenderness	42	84
Distension	33	66
Obliteration of liver dullness	22	44
Absent or diminished bowel sounds	36	72
Per-rectal Tenderness	6	12

**OBSERVATION :**

In the present study most cases had guarding and rigidity at the time of hospitalization (84%), rebound tenderness (84%),no bowel sounds were heard in 72% cases, distension of abdomen (66%), obliteration of liver dullness (44%) and per rectal tenderness (12%).

**TABLE 4: HEMODYNAMICS**

HEMODYNAMICS	RANGE	Mean +/-SD
PULSE (beats/min)	66-120	99.34+/-12.1
SBP mm hg	90-150	117+/- 96
DBP mm hg	60-100	73.2+/-12.5

**OBSERVATION:**

The pulses, B.P. were within the normal range. The mean of pulse rates recorded was 90beats/min, mean SBP was 117 mm Hg and mean DBP was 73 mm Hg.

**TABLE 5: POST OPERATIVE DIAGNOSIS**

POST OPERATIVE DIAGNOSIS	NUMBER (N=50)	%
<b>ILLEUM PERFORATION</b>		
Typhoid	12	24.0
Tuberculosis	10	20.0
Iatrogenic	1	2.0
Ischemic Bowel Disease	3	6.0
Non specific	8	16.0
<b>JEJUNUM PERFORATION</b>		
Traumatic	3	6.0
Ischemic bowel disease	1	2.0
Non specific	6	12.0
<b>APPENDICULAR PERFORATION</b>		
Faecolith	4	8.0
Non specific	2	4.0

**OBSERVATION:**

68% of cases in our study presented with ileal perforation and thus it was the most common type. Among the total ileal perforations 24% were due to typhoid disease. 1 case of ileal perforation was due to iatrogenic cause. The patient had undergone Abdominal Hysterectomy 15 days prior to development of pain abdomen which did not improve on conservative treatment. On re-laparotomy, a loop of ileum was caught in the suture during abdominal closure. Resection and end-end anastomosis in 2 layers was done in this case.

**TABLE 6: TYPE OF INCISION**

TYPE OF INCISION	NUMBER( N=50)	%
McBurney's	2	4.0
Right Para median	2	4.0
Midline	46	92.0

**OBSERVATION:**

The incision was right Para median in (4%),midline in 92% cases and Mc Burney's incision (4%cases). Appendicular perforation was seen in 6 cases and McBurney's incision was used.

**TABLE 7: TYPE OF SURGICAL PROCEDURES**

TYPE OF SURGICAL PROCEDURE	NUMBER N=50	%
Resection & End-End anastomosis in 2 layers	30	60.0

Resection & End-End anastomosis in one layer	4	8.0
Simple closure in one layer	13	26.0
Simple closure in one layer with omental patch	3	6.0

**OBSERVATION:**

Resection & End-End anastomosis in 2 layers was done in 60% of cases, Simple closure in 1 layer was done in 26% of cases, Resection & End – End anastomosis in 1 layer was done in 8% of cases and in 6% cases ,Simple closure in 1 layer with Omental patch was done.

**TABLE 8: POST OPERATIVE COMPLICATIONS**

POST OPERATIVE COMPLICATIONS	NUMBER N=50	%
WOUND INFECTION	17	34
BURST ABDOMEN	3	6
ANASTAMOTIC LEAKAGE	9	18
PERFORATION	1	2
ENTERO CUTANEOUS FISTULA	1	2
MORTALITY	5	10
NO COMPLICIONS	14	28

**OBSERVATION:**

Wound infection was the most commonly encountered complication and was seen in 17 cases (34%).

3 patients have shown Wound dehiscence. 1 patient hadreperforation. The patient was a case of Ischemic Bowel Disease. The patient was treated by re-laparotomy, gangrenous bowel has been resected and end-end anastomosis done in 2 layers. Enterocutaneous fistula was seen in 1 case and treated by re laparotomy, gangrenous bowel was resected and end-end anastomosis done in 2 layers. Anastomotic leak was observed in 9 patients. 5 deaths were encountered in the present study (10%). One death was seen in patient with re perforation in case of Ischemic Bowel Disease. One death was with ileal perforation where patient developed Acute respiratory distress syndrome and not affordable for Intensive care.

One death was seen in jejunal perforation as the patient developed acute renal failure. Two patients died in the postoperative period in view of septicemic shock.

**TABLE 9: complications and follow up status in postoperative period**

POST OPERATIVE COMPLICATIONS	Upto 1 week (n=50)	Follow up		
		15 days (n=44)	30 days (n=43)	60 days (n=41)
Wound infection	17 (34.0)	14 (31.8)	10 (23.2)	1 (2.4)
Burst abdomen	3 (6.0)	2 (4.5)	1 (2.3)	-
Reperforation	1 (2.0)	-	-	-
Entero cutaneous fistula	1 (2.0)	-	-	-
mortality	5 (10.0)	-	-	-
No complication	23 (46)	28 (63.7)	32 (74.4)	40 (97.5)
Lost to follow up	-	1	2	4

**OBSERVATION:**

The patients were followed up for a period of 2 months and the complications were noted. 4 patients were lost to follow-up. At the end of 2 months, 1 case had wound infection (2.4%). In this case, the patient had undergone Re- laparotomy for iatrogenic ilealperforation as explained earlier. The wound was infected and healed with regular dressings for three months.

**DISCUSSION:**

The maximum incidence of 75% in our study were in the middle age group of 20 - 40 years and these results are comparable to D.C.M.Rao et al[7],1984 study in which the maximum incidence was in the same age group(50%).There is a male predominance In our study males were mostly affected i.e. 4:1 and is comparable to (8.4:1) which was seen in M.C.Dandapat et al[8],1991 & (14.3:1) which was seen in D.C.M.Rao. et al[7],1984 studies. Dr.A.Raja Gopala Rao et al[9],2016 study also shows similar results with 68% males and ratio of 2.12:1. In the present study,most common cause of ileal perforation was typhoid (24%), followed by Tuberculosis (20%), Nonspecific(20%), ischaemic bowel disease(06%), Iatrogenic(02%). Typhoid perforations was the most commonly found small bowel perforations and this was speculated by analysing 12 regional reports in various

regions of India in 450/513 cases (87.7%) in the time period of 1972-1989 Wani et al[10], study reported in 2006 with typhoid as the common cause of non traumatic ileal perforation. Other studies that had shown comparable results in recent ages were Bhanuprakash KR et al[11], 2018 study, Dr. A. Raja Gopala Rao et al[9], 2016 study. In Bhanuprakash KR et al[11], 2018 study, the ileal perforation has following etiologies like typhoid (47.8%), TB (13%), nonspecific cause (21.7%), traumatic (13%), and iatrogenic (4.3%). The cause of Jejunal perforation was trauma (42.8%) usually and the remaining were found to be non-specific (57.2%). In, Dr. A. Raja Gopala Rao et al[9], 2016 study, the common etiologies of the perforation were enteric fever(38%), TB (22%) and nonspecific (27%).

#### Presenting complaints:

Anorexia, fever, abdominal pain and abdominal distension were the most presenting features in Waqar alam Jan et al, 2002 study which is comparable to our findings. In Bhanuprakash KR et al[11], 2018 study, the most commonly encountered presenting symptom was abdominal pain (85%) and the commonest clinical sign found in most of the patients was dehydration (24%). Similar comparable results were found in other studies like Wani et al[10], 2006 and.

Dr.A.Raja Gopala Rao et al[9] 2016. G.C.Sepaha[6] et al showed the following clinical features in 60 cases.

**Physical findings** In our study majority of patients had guarding and rigidity at the time of hospitalization (84%), rebound tenderness (84%), 72% cases had shown no bowel sounds, distension of abdomen (66%), (44%) cases had shown the sign of obliteration of liver dullness and on examination (12%) cases had shown tenderness per rectally. Tenderness, rigidity and absence of bowel sounds are the most frequent signs found in the 100 patients study of Bhanuprakash KR et al[11], 2018. Also abdominal tenderness was the sign found in most of the patients (86%) in Dr. A. Raja Gopala Rao et al[9], 2016 study.

Our results were comparable to other studies such as Seth S, Agrawal KK et al[12] 2016 study, Shabir shaikh et al[13] 2011 study. Similar results on X ray erect abdomen and free fluid in abdomen on ultrasonogram of the abdomen was found in Chalya et al[14] 2012 study.

**Incision:** The most common incision was Midline in 92% in our series; Right Para median incision (66%) was the frequently used incision in Waqar Alam Jan et al, 2002 study.

**Site of perforation:** In our study, the most common site was ileum and these results were comparable with Wani et al[10] 2006 study and Dr. A. Raja Gopala Rao et al[9] 2016 study.

**Number of perforations:** In our study, single perforation in the ileum was the mostly encountered finding. Our study results were comparable with Dr. A. Raja Gopala Rao et al[9] 2016 study.

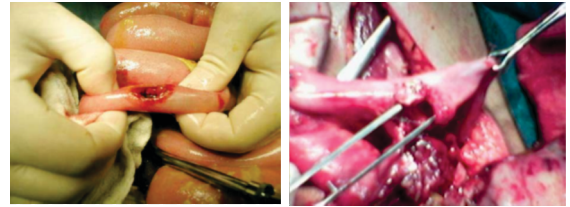
**Surgical procedures:** Resection and End - End Anastomoses was done in majority of cases in our study which reported less number of complications. In Chalya et al[14] 2012 study, simple closure of the perforation in 2 layers was the most common procedure done. In Jean Marie et al[5] 1983 study- simple double layered closure of the perforation was the most frequent type of closure done.

#### COMPLICATIONS:

The frequently seen complication in this study was Wound Infection which accounted for 17 cases(34%). 3 patients had wound dehiscence. Renal failure and Acute respiratory distress syndrome (2%) were also part of the complication. 5 deaths were seen in the present study (10%) S.K.Nair et al, 1981 reported wound infection as their frequently seen complication in 26 cases (52%), respiratory infection in 2 cases(4%). In Bhanuprakash KR et al[11] study, the highest rate of post-operative complications were seen in ileal perforations and the common complication was found to be wound infections in patients with perforation of small bowel. Similar results were found in Wani et al.[10] 2006 study, our study and Dr.A.Raja Gopala Rao et al[9] 2016 study 10% of mortality was seen in our study and similar mortality rate was seen in Vadianadan et al, 1986 but J.M.Eustache et al.[5] 1983(30%) study has encountered less mortality which was similar to Prasad et al 15. 1975 (20%) study. In Bhanuprakash KR et al [11] 2018 study, ileal perforation has highest mortality as compared to jejunal and other small bowel perforations. Similar results were reported in Wani et al[10] 2006 study and Dr.A.Raja Gopala Rao et al[9] 2016 study.

#### CONCLUSION

Males were the most frequently affected sex (4:1). The common age group involved was 20 - 40 years. The most frequent symptom was pain abdomen and the next common was vomiting followed by abdominal distension and constipation. The investigations which aided in the diagnosis were USG abdomen, erect abdomen X-ray. Most common technique employed was Resection and anastomosis in 2 layers. The frequently encountered complication postoperatively was surgical site infection.



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