



AN OBSERVATIONAL STUDY OF GASTRIC AND INTESTINAL PERFORATIONS IN A TERTIARY CARE CENTRE IN CENTRAL INDIA

General Surgery

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ABSTRACT

Peritonitis due to perforation of viscous either post traumatic or nontraumatic is an important cause of morbidity and mortality in an emergency. Peptic ulcer is one of the most common malady that affects the Indian population. Perforation of gastric or duodenal ulcer is one of the most serious and most overwhelming catastrophic that is affecting human being. The following study was conducted with the intent of finding the relative frequency of anatomical site of perforation, the relative causes implicated in the etiology for perforation and the complication in the outcome of perforation. This was a clinical observation study conducted in a Tertiary Healthcare Centre in Central India between 1/7/2018 to 30/6/2019. A total of 104 were enlisted, after satisfying the inclusion criteria for this study with a male to female ratio of 6:1. Epigastric pain was the most common symptom reported. After thorough evaluation and resuscitation, open exploration was done for all patients. Duodenal ulcer perforation was seen in majority of the patients, the cause being peptic ulcer disease. Post operatively, all were given anti H. pylori treatment. Complications were reported in 39 patients post operatively and there were 6 deaths in the post operative period. A total of 59 patients recovered without any complication in the post operative period. LRTI was the most common complication noted. The mortality was higher in those patients who reported more than 24 hours after onset of symptoms.

KEYWORDS

Perforation Peritonitis, Exploratory Laparotomy, Mortality, Outcome.

1. INTRODUCTION

Peritonitis due to perforation of viscous either post traumatic or non traumatic is an important cause of morbidity and mortality in an emergency⁽¹⁾.

Peritonitis secondary to perforation of the gastro intestinal tract, a common occurrence in this country, requires emergency surgical intervention and is associated with significant morbidity and mortality⁽¹⁾. A delay in seeking a surgical opinion contributes to make the situation even worse. Surgery plays an important role in the management of perforations. Evaluation and management of gastro intestinal perforation provide some of the most challenging experiences for a surgeon with the advent of new technology.

Peptic ulcer is one of the most common malady that affects the mankind in India. Though lot of work had been done on the etiology of this condition, one specific etiological agent cannot be incriminated in the causation of this particular disease especially in our part of country. Smoking and use of non steroidal anti-inflammatory drugs are important risk factors for peptic ulcer perforation^(2,3). Perforation of gastric or duodenal ulcer is one of the most serious and most overwhelming catastrophic that is affecting human being (**Lord Moynihan**).

The treatment of perforation still continues to be controversial. Just closure of perforation may save life, but chance of recurrence of ulcer is too high and patient may not turn up for a second curative surgery. So, there is a school of thought, which recommends definitive surgery in a perforated peptic ulcer. This may to a certain extent reduce the mortality and morbidity of the patient, because patients have to risk a major operation when the general condition is not good. On the other hand, it saves the patient of further surgery. In spite of better understanding of disease, effective resuscitation and prompt surgery under modern anesthesia techniques, there is high morbidity and mortality^(4,5). Hence; attempt has been made to analyze the various factors, which are affecting the morbidity/mortality of patients.

2. Aims and Objectives

- To find the relative frequency of anatomical site of perforation.
- To find the relative frequency of causes resulting in perforation.
- To study the outcome of various methods of surgical management

in perforation peritonitis.

- To study the outcome in patients due to delay in surgery from onset of symptoms.

3. MATERIALS AND METHODS

In the present study, a total of 104 patients were included with the diagnosis of perforation peritonitis and managed in the tertiary care centre.

3.1 Study Design

This study was a prospective observational study conducted in between

3.2 Inclusion Criteria

- Patients of either sex.
- Patients of age >15 years.
- All patients with clinical diagnosis of perforation peritonitis.

3.3 Exclusion Criteria

- Patients of pediatric age group.
- Patients of blunt trauma and stab injury.
- Operated patient referred from other hospital.

3.4 Methodology

The following investigations were carried out for all the patients.

- Hemoglobin, Total leucocyte count, Differential count, Platelet count, Blood urea, Sr.creatinine, Sr.electrolytes.
- Blood grouping & cross matching.
- X-ray Chest PA view & Abdomen erect or lateral decubitus view
- Electro-cardiogram
- Widal test
- Peritoneal fluid cultures.

All the patients after confirmation of the diagnosis and proper resuscitation were taken for emergency surgery after proper written consent. Most of the operations were done under general anesthesia. Abdomen was opened by midline incision and searched for the site of perforation and dealt with appropriate interventions. Thorough peritoneal lavage was given in all cases and abdominal tube drains were kept and closure was done in one layer by polypropylene number 1 suture. Skin incision kept open to be closed by secondary suturing

later in cases of ileal perforations.

In post operative period early mobilization was encouraged, chest physiotherapy was given to all. Early feeding started after the return of bowel sounds and passage of flatus. Proper wound care taken. Abdominal drains removed when the total output was less than 100 ml for 3 consecutive days. Suture removal was done after 10 days in case with no wound infection and in those with SSI it is done later.

After discharge patients were followed up in OPD. In all cases of peptic ulcer perforation treatment given for H. Pylori eradication.

4. OBSERVATION AND RESULTS

In this study a total 104 patients were admitted in a tertiary healthcare centre in Central India who satisfied the inclusion criteria, were included from 1/7/2018 to 30/6/2019.

In the present study, there were 90 male patients and 14 female patients with male to female ratio of 6:1.

Figure number 1 shows the distribution of male and female patients in this study

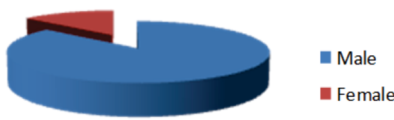


Figure no. 1 – Male to female distribution in the study

Following table shows the relation of population demographics with the intra-operative findings of the site of perforation.

Table no. 1 - relation of population demographics with the intra-operative findings of the site of perforation.

Diagnosis	Male	Female	Total
Gastric	13	03	16
Duodenal	52	05	57
Small Intestine (Jejunum and Ileum)	18	03	21
Appendicular	03	02	05
Colonic	04	01	05
Total	90	14	104

The following figure shows the above data in the form of a bar diagram.

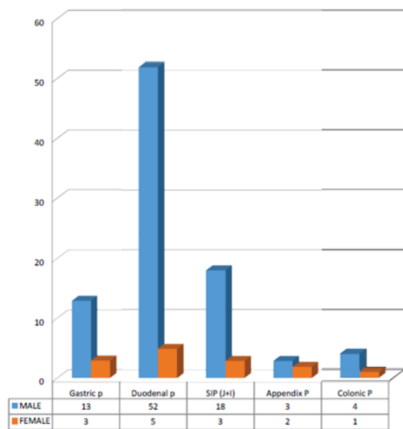


Figure no. 2 - relation of population demographics with the intra-operative findings of the site of perforation.

The following table shows the age wise distribution of patients with perforation:

Table number 2 – showing age wise distribution of patients with perforation.

Age group(years)	No. of patients	Percentage
<20	12	11.5
21-30	15	14.4
31-40	25	24.1

41-50	18	17.3
>51	34	32.7
Total	104	100

The highest number of patients was seen in the age group above 50 years (32.7%), irrespective of the pathological conditions followed by 31 – 40 year age group (24.1%), least in the age group of <20 years (11.5%). In this study youngest patient encountered had the age of 16 years and the oldest was 72 years.

The following table shows the anatomic distribution of site of perforation with the age group of patients:

Table number 3 – showing the anatomic distribution of site of perforation with the age group of patients

Age (years)	Peptic Perforation	Small Intestine (Jejunum + Ileum)	Appendix	Large Intestine
< 20	6	4	0	1
21 – 30	10	3	2	0
31 – 40	18	6	1	0
41 - 50	11	6	0	1
> 51	27	2	2	3
Total	73	21	5	5

The etiological agent was also studied for individual cases in this study. The following table gives the etiology for perforation peritonitis.

Table number 4 – showing etiology of perforation peritonitis.

Cause	Number of Patients	Percentage
Peptic ulcer	73	70%
Appendicular	05	4.8%
Enteric	16	15.4%
Tubercular	01	0.9%
Diverticular	01	3.8%

In all the patients of gastric ulcer biopsy was taken to rule out malignancy. In this study peptic ulcer is the commonest cause of perforation peritonitis followed by typhoid fever and appendicitis.

The patients in the study presented with various symptoms and signs. The table below gives the entire details of clinical features of the patients included in the study:

Table number 5 – showing details of clinical features of the patients included in the study.

Symptoms & Signs	No of patients	Percentage
Pain	104	100
Fever	23	22
Vomiting	99	95
Obliteration of Liver Dullness	94	90
Distention	84	80
Dehydration	70	67
Guarding & Rigidity	104	100
Altered Bowel sounds	104	100

Most common symptom was pain in all patients, followed by vomiting (90%) and distention of abdomen (80%). In patients of appendicular perforation there was no abdominal distention. Most common sign was guarding and rigidity found in all cases. In peptic perforation cases it was generalized while in appendicular perforation it was localized to right iliac fossa and in colonic perforation in pelvis. X-ray abdomen erect was done in almost all cases. In some cases, X-ray left lateral decubitus view was taken as patients general was not good. Pneumoperitoneum was found in 91% cases. In patients of appendicular perforations pneumoperitoneum was not found.

Different operative interventions were undertaken for the patients included in the study. The following table gives the number of patients who underwent the selected procedure for perforation peritonitis:

Table number 6 – showing number of patients who underwent the selected procedure for perforation peritonitis.

Operations	No. of Patients	Percentage
Omental patch closure	73	70.1
Appendicectomy	5	4.8
Resection-Anastomosis	13	12.5

Ileal Simple Closure	4	3.8
Simple Closure with stoma	4	3.8

The patients were monitored in the wards/recovery room in the post-operative period. The following common complications were noted and apt measures were taken to treat them.

Table number 7 – Post op complications according to site of perforation

Post - op	Gastric	Duodenal	Small Int.	App.	Large Int.	Total
Wound Infection	2	8	0	1	1	12
LRTI	4	14	2	0	0	20
ARF	2	1	0	0	0	3
Wound Dehiscence	1	3	0	0	0	4
ARDS	0	1	0	0	0	1
Septicemia	1	1	3	0	0	5
Nil	12	30	17	4	4	67
Total	16	57	21	5	5	104

The time of presentation of patients to the outpatient department or the surgery casualty was different for different patients. Depending upon the time of presentation, the outcome was seen in the patients. The following table gives the outcome of patients, depending upon the time of presentation:

Table number 8 - Recovery of the patient depending on time of presentation

Duration(hours)	No.	Recovered	Complication	Mortality
0 - 6	5	5	0	0
6 -12	14	12	2	0
12 - 24	21	16	4	1
> 24	64	26	33	5
total	104	59	39	6

Later the presentation, more are the complications. Patients who presented with short duration of symptoms before admission had less morbidity and mortality than presenting late. 90% of death occurred in patients presenting after 24 hrs.

Mortality was seen in 6 patients. Maximum belonged to the age group of > 51 years and presented at > 24 hours. One was seen in a case of ileal perforation, rest all were seen in cases of peptic ulcer perforations.

5. DISCUSSION

This study was conducted in a Tertiary Healthcare Centre in Central India. A total of 104 patients admitted with perforation peritonitis according to particular criteria fixed during the study period of 1/7/2018 to 30/6/2019 were taken as study population.

All the patients after preoperative workup and confirmation of diagnosis were taken for emergency laparotomy as early as possible and were operated according to the intra-operative diagnosis.

5.1 Anatomical sites of Perforation

In present study Gastro - duodenal ulcer perforation were the most common cause for peritonitis (70.2 %). Incidence of jejunum - ileal perforation was 20.4% followed by appendicular and large intestinal (4.8%) perforations. On comparison with other Indian studies, higher incidence of gastro - duodenal perforations are found. This is due to the fact that the consumption of spicy diet and alcohol in Indian subcontinent, in general, is on the higher side, leading to a higher incidence of peptic ulcer disease with the complication of perforation.

Table number 8 – showing comparison of site of perforation

	Present	Meena et al [6]	Vishnu et al	Verma et al
Gastro Duodenal	70.2	46.4	51	44.75
Appendix	4.8	8.1	16.7	18.5
Jejunum + Ileum	20.4	41	29	32
Large Intestine	4.8	4.5	1.7	4.75

5.2 Age of patients

Highest number of patients were seen in age group > 50 years and minimum in < 20 years age group. The mean age for perforation found in this study was 42.4 years. On comparison with other Indian studies, the mean age for patients was from 39 years to 44 years. However, age

is no bar for perforation as it has also been reported in 4 years old infant.

Table number 9 – showing the mean age of patients having perforation peritonitis

Studies	Present	Meena et al [6]	Vishnu et al [7]	Verma et al [8]
Mean age (years)	42.4	39.13	44	37.8

5.3 Sex of patients

A major part of the study group was males (86 %) whereas females accounted for (14 %) of cases with male to female ratio of 6:1. In other studies, a higher incidence in males was found, indicating more risk factors implicated in etiology of perforation peritonitis.

Table number 10 – showing male to female ratio of patients with perforation peritonitis.

Studies	Present	Meena et al [6]	Vishnu et al [7]	Verma et al [8]
Ratio	6:1	10.3:1	7:1	2.1:1

5.4 Etiology of Perforation

In the present series, peptic ulcer perforation was most commonly implicated in the etiology of perforation peritonitis (70 %). Other causes were enteric fever, acute appendicitis, diverticulitis and tuberculosis. In the various other Indian studies, these etiological agents were seen in following percentage of cases.

Table number 11 – showing etiology of perforation

	Present	Meena et al [6]	Sarkar et al [9]	Verma et al [8]
PUP	70 %	41.4 %	64 %	44.75 %
Appendicular	4.8 %	7.9 %	24 %	18.5 %
Enteric	15.4 %	19.2 %	4 %	12 %
Tubercular	0.9 %	5.2 %	6 %	10 %
Diverticular	3.8 %	2.2 %	0	0

5.5 Surgery opted

Various operative measures were used for repair of perforations at various sites. These were employed during the emergency exploration of patient. However, no patient in the present study underwent a definitive surgery in case of peptic ulcer perforation as all were given anti H. pylori treatment. Transverse colostomy and sigmoid colostomy were done for 2 patients of large intestinal perforation. Resection anastomosis was done when the condition of bowel and the general condition of patient was compatible for the procedure. The types of surgeries employed in the present study

Table number 12 – showing surgeries opted for perforation peritonitis

	Present	Meena et al [6]	Vishnu et al [7]	Verma et al [8]
OPC – Omental patch closure	70.1 %	63.8 %	65 %	43.75 %
Stoma	3.8 %	17.4 %	5 %	22.5 %
Appendicectomy	4.8 %	7.9 %	24 %	17 %
RA – resection anastomosis	12.5 %	7.2 %	4 %	6.25 %
Simple Closure	3.8 %	0	2 %	6.75 %

5.6 Post-operative Complications

In the present series most common post operative complication was Lower Respiratory tract infection manifesting itself as cough with expectoration, fever and fall in oxygen saturation. Patients were managed with IV antibiotics, nebulization and 3 ball spirometry. Burst abdomen seen in 3.8 % of the patients and were managed with daily dressings followed by secondary suturing. When compared with other studies, incidence of LRTI is most common except in one study wherein incidence of SSI was the highest.

Table number 13 – showing post – operative complications observed in case of perforation peritonitis

	Present	Meena et al [6]	Sarkar et al	Verma et al [8]
LRTI	19.2 %	24.2 %	31 %	16.75 %
SSI	11.5 %	20 %	16 %	31.25 %
Burst	3.8 %	9 %	5 %	13.75 %
Leak	-	6.1 %	-	1.5 %
Sepsis	4.8 %	-	8 %	-
abscess	-	10.2 %	-	20 %

5.7 Relation between time of presentation and Clinical Outcome

Patients who presented early to the hospital were having less morbidity and mortality than those presenting late. The patients who presented late were having more dehydration, more peritoneal contamination, renal problems, respiratory problems, more exposure to septic content because of which they had more morbidity and mortality as compared to patients presenting early who were more stable.

Mortality was 7.8% in patients presenting after >24 hours as compared to 4.7% in those presenting between 12- 24 hrs. The study conducted by Kocer et al gives a similar picture indicating that late presentation contributes to a high morbidity and mortality

Table number 13 – showing outcome of patients presenting late

	Present (percentage mortality)	Kocer et al [10] (percentage mortality)
< 24 hours	2.5 %	3.7 %
>24 hours	7.8 %	20 %

5.8 Mortality

Overall mortality in present series was 5.7 %. Mortality is high in patients who were taken up late for surgery because of late presentation and time taken for resuscitation.

Delay in the surgery and extensive contamination of the peritoneum were most important factors for mortality. Advanced age was also a contributing factor.

One small bowel perforation patient had death due to extensive peritonitis and septicemia.

Therefore, contamination is a crucial consideration in patients with peritonitis and problem of mortality is a problem of infection. So, by early surgical intervention, we succeed in preventing further contamination by removing the source of infection though the end result will also depend upon the general host resistance and the antibiotic sensitivity of the organism. Other studies show maximum mortality of 16.5 %, in the Indian population.

Table number 14 – showing mortality in the patients

Present	Meena et al [6]	Vishnu et al [7]	Verma et al [8]
5.7 %	14.7 %	16.5 %	7 %

6. SUMMARY AND CONCLUSION

Following conclusion can be drawn from our study:

1. The highest number of patients was seen in the age group 51 years and above, irrespective of the pathological conditions followed by 31–40-year age group. Most of the patients presented after 24 hrs of the clinical symptoms. Males are more commonly affected than females irrespective of cause.
2. Peptic ulcer disease was the most common cause of perforation. Duodenal ulcer was the most common cause of perforation in perforation peritonitis, next commonest was gastric ulcer perforation followed by ileal and appendicular perforation. Jejunal and colonic perforations are rare.
3. Duodenal ulcer perforation was more common in the 50 years and above age group, also more common in females.
4. Most of the patients presented after 24 hrs after start of symptoms.
5. Pneumoperitoneum on x-ray was the most common positive investigation. But absence of pneumoperitoneum is not a criterion to rule out the diagnosis of gastrointestinal perforations.
6. Laparotomy with omental patch closure still continues to be the commonest method of surgical management in perforation peritonitis.
7. Lower respiratory tract infection is the most common complication observed.
8. Mortality observed in 5.7 % of the cases of perforation peritonitis and most of the patients presented > 24 hours of the onset of symptoms.

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