



ORIGINAL RESEARCH PAPER

General Surgery

PROFILE OF PATIENT WITH GASTRO INTESTINAL PERFORATION: A TERTIARY CARE CENTER STUDY

KEY WORDS: Gastro-intestinal perforation, Haldwani, Laparotomy, Peptic ulcer, Sushila Tiwari.

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ABSTRACT	Background: Gastro intestinal perforation peritonitis is a common surgical emergency with a wide variety of clinical features and causes. Regional variations are common with regards to the cause of intestinal perforation, and need to be addressed. The objective of the study was to highlight the spectrum of perforation peritonitis encountered at our tertiary center.
	Methods: Our study was a descriptive retrospective analytic study. The data of patients who had surgical intervention for gastro intestinal perforation peritonitis in the general surgery department of Dr. Sushila Tiwari Govt. hospital attached to GMC Haldwani, between 2014 and 2016 was evaluated retrospectively. All data of patients was collected which includes mainly information about age, additional morbidity and operative notes.
	Results: In our study most common site of perforation was ileum 35%, followed by gastric 27.5%, duodenum 20%, jejunum 5%, appendix 10% and colon 2.5%. Main causes included peptic ulcer 42.5%, typhoid 25% and few cases of trauma, tuberculosis, appendicitis and malignancy. Morbidity rate was 60.0% and mortality rate was 14.5%.
	Conclusions: Commonest site of perforation was gastro-duodenal while commonest cause was peptic ulcer disease. Morbidity and mortality was comparable with other studies

INTRODUCTION

Gastro intestinal perforation is one of the most serious and frequently encountered surgical emergencies. Out of all emergency surgical hospital admissions due to acute abdomen, the prevalence of intestinal perforation could be up to 20-40 %.(1) Gastrointestinal (GI) tract perforations can occur due to various causes, and most of these perforations are emergency conditions, that require early recognition and timely surgical treatment (2). The mainstay of treatment for bowel perforation is exploratory laparotomy and repair of perforation. Gastro intestinal perforation causes efflux of contents into the peritoneal cavity leads to initial chemical peritonitis. If continuing leakage of gastro intestinal contents, bacterial contamination of the peritoneal cavity can occur (3,4). Peritonitis due to perforation of gastro intestinal hollow viscus is the common surgical emergency in India and the spectrum of disease is different from that found in the western world. The advent of proton pump inhibitors and helicobacter pylori eradications in the management of chronic peptic ulcer disease has reduced the operative treatment of this condition to its complications. But yet perforated gastroduodenal ulcer remains a major life threatening complication of chronic ulcer peptic disease. The morbidity and mortality is adversely affected by several factors pertaining to delay in seeking treatment, poor clinical condition at admission, type of perforation and complicating features.

METHODS

Our study was a retrospective analytic study. Approval was obtained from the ethical committee of Government Medical College Haldwani. Medical record of all patients who were operated between July 2014 and June 2016 for gastro intestinal perforation at surgery departments of Dr. Sushila Tiwari Government Hospital were retrospectively analysed. The patients who were operated for perforation peritonitis and whose complete medical record was available, were included in the study. The patient's particulars such as age, gender, pre-operative clinical examinations and investigations, type of operative procedure, post-operative morbidity and mortality were noted from files. Diagnosis of perforation peritonitis made by analysis of radiological (X-Ray, CT) and intra-operative findings reports obtaining from patients records.

Statistical Analysis

The data were recorded and descriptive analysis were made with SPSS v23 (IBM SPSS Statistics 2015). The data are defined in percent ratios.

RESULTS

Total 200 cases of gastrointestinal perforation were recorded in our study. The most of them are male 150 (75%) while female patients were 50 (25%). Male to female ratio was 3:1. Mean in our study was 37.63±14.26year, and patients age range from 18 to 70 years.

The mean age of males was 40.5±14.8 years, while that of females was 28.9±8.1 years. The maximum number of cases was in the age group of 20-39 (47.5%) while the least number was in the age group of ≥60 (7.5%). Site and characteristics of perforation The site of perforation was ileum 35.0% gastric, 27.5% and duodenum, 20.0%, gastro-duodenal 47.5%. Perforation of large intestine were less common. Gastric and duodenum perforations were mainly in males, 94.7% whereas at the other sites males were 57.1%.

The exact location of perforation at different sites show a wide area of involvement. However, in gastric perforation the majority were in the pre-pyloric region (45 out of 55 cases, 81.8%). Similarly, most of the perforations in the duodenum were in the 1st part (38 out of 40 cases, 95.0%). Ileal perforations were widely distributed but were more in the terminal ileum within 30 cm from the ileo-caecal junction (50 out of 70 cases, 71.4%).

Almost all the cases in the present series had a single perforation (185 cases, 92.5%). Two or more perforations were seen in only 15 cases of ileal perforation, including 6 case with 2 perforations and another 9 cases with multiple perforations.

The size of perforation was small, less than 1 cm maximum diameter, in 70 cases (35.0%) while it was of medium size, i.e. 1 cm to less than 2 cm, in another 65 cases (32.5%). Large perforation of 2 cm or more was noted in 65 cases (32.5%). The size varied with the site of perforation. Gastric perforation was small in almost half of cases, 45.5% (25/55) compared to ileum where small

perforations constituted only 14.3% (10/70). Most of the large perforations, 53.8% (35/65) were in the ileum.

The common symptoms in cases with intestinal perforation were consistent with the typical complaints or abdominal pain, vomiting, constipation and abdominal distension in various combinations. The commonest chief complaint was acute abdominal pain which was seen in as many as 95.0% (190) cases, leaving only 10 cases with trauma who had other overwhelming presenting features. Nausea/vomiting was reported in 100 cases (50.0%) while obstipation and abdominal distension was complained of in 55 (27.5%) and 60 (30.0%) patients respectively. Fever was reported by 60 patients including those with underlying typhoid infection. There was wide range of duration of abdominal symptoms before the patients presented to the emergency department of the hospital, ranging from less than 24 hours to 15 days. Symptom duration was rather evenly distributed in the time groups of ≤ 1 day, 2-3 days, 4-7 days and ≥ 7 days. More than half the cases presented beyond 4 days (105 cases, 52.5%) including 50 cases (25.0%) beyond 7 days. The duration of symptoms prior to admission varied with the site of perforation, being the shortest with gastric perforation; 63.6% (35/55 cases) had less than 24 hours of symptoms and as high as 81.8% (45/55) within 3 days prior to admission. Conversely, in ileum perforation the vast majority of cases, 85.7% (60/70) had abdominal symptoms of more than 4 days. 15 of the 20 cases of appendicular perforation had symptoms over 7 days predisposing to this complication of acute appendicitis. The vital signs at time of admission were noted. Tachycardia with pulse rate >100 / min was observed in 52.5% (105 cases) and tachypnea with respiratory rate >20 / min in 12.5% (25 cases). The majority of patients were afebrile at the time of admission. Hypotension requiring active resuscitation was observed in 22.5% (45 cases) while 12.5% (25 cases) were hypertensive. The mean vital signs in patients with different sites of perforation showed a similar range suggesting that particular sites of perforation was not significantly associated with specific alteration in the vital signs.

The typical physical signs of intestinal perforation, accompanied by peritoneal fluid collection viz. abdominal distension, tenderness, guarding and rigidity, absent bowel sounds and free fluid in the abdominal cavity were elicited in all cases. The vast majority, 87.5% (175 cases) had air detected under the diaphragm in the chest radiograph. Abdominal ultrasound revealed free fluid in the abdominal cavity and pelvis. The clinical and radiological diagnosis of perforation was thus clear in all the 200 patients. Co-morbidities unrelated to the presenting ailment of intestinal perforation were seen in some of the patients. The commonest was old tuberculosis associated with perforation, in 30 cases followed by hypertension (25 cases).

The etiological background dictated the site of perforation. Peptic ulcer disease was the cause of perforation in 44.5% (89 cases) involving the stomach in 51 cases and duodenum in 38 cases. Typhoid accounted for 24.0% (48 cases), all in the ileum. Acute appendicitis resulted in perforation of the appendix in 20 cases (10%) while trauma and tuberculosis accounted for 13 and 20 cases respectively. There was 5 case of malignancy and 2 cases of volvulus. Three cases had non-specific

The operative procedures included primary repair of the perforation, resection with anastomosis, stoma (ileostomy or jejunostomy) or appendectomy depending on the clinical indication. Primary repair was carried out in 115 cases (57.5%) while resection anastomosis was done in 20 cases (10.0%). Stoma was created in 43 cases (21.5%) including 38 with ileostomy and 2 with jejunostomy 3 colostomy. All the cases of gastric and duodenal perforation had primary repair with omental patch. Ileal perforations in the 70 cases needed primary repair, resection and anastomosis or ileostomy in 18, 16 and 34 cases respectively. The 20 cases with appendix perforation had appendectomy but 4 of these had resection of adjacent gut due to gangrene.

The overall morbidity rate, inclusive of all complications and post-

operative problems, was 60.9%, i.e. 122 cases had one or more such morbidities. Post-operative wound complications occurred in 70 cases (35.0%) in the form of local infection, out of whom 30 developed wound dehiscence. 10 of these progressed to burst abdomen. Other morbidities that occurred in the post-operative period were in the form of systemic complications, the most frequent of which was respiratory (45 cases, 22.5%).

The operative procedure did not appear to have any relationship with the incidence of complications, which were widely scattered in the various groups, and it was not possible to establish any relationship of wound complications or systemic complications with the type of surgery performed.

The mortality rate in this study was 14.5% (29 cases). Of the deaths, 18 occurred in patients with ileal perforation. 8 cases had gastric perforation 2 of colonic perforation and another had complicated appendicitis with extensive gangrene and sepsis. All these patients expired within 10 days of admission and 8 of the 17 cases expired within 5 days indicating the serious clinical condition at presentation

DISCUSSION

The majority of the cases were males, with a male: female ratio of 3:1. The male preponderance has been uniformly reported in various other studies especially from the developing world, with wide variation of 3.3:1 to 9:1.5⁶. The age of the patients in this study ranged from 18 to 70 years with a mean of 37.6 ± 14.3 years. The mean age of males was higher than that of females.

The site of perforation in this study was ileum, in 35.0%, gastric, 27.5% and duodenum, 20.0%. Perforation of appendix and large intestine were less common. Gastric and duodenum perforations were mainly in males, 94.7%, whereas at the other sites males constituted 57.1%. In a retrospective analysis of 250 patients with peritonitis over a decade at a referral surgical unit in New Delhi, Dorairajan et al also revealed that perforations of the upper gastrointestinal tract occur in the majority unlike the west where perforations of the lower gastrointestinal tract predominate. Batra et al found that the site of perforation was gastroduodenal, small bowel, appendix, colon, rectum in 80.3%, 14.1%, 38%, 1.3% and 0.6% respectively.

Almost all the cases, 92.5%, had a single perforation. Two or more perforations were seen in only 15 cases out of the 70 cases of ileal perforation, i.e. 78.6% of ileal perforations were single. This is consistent with the observation of Freeman, who studied 41 cases of ileal perforation and found that the majority of cases, 78%, had a single perforation (8).

In this study the common symptoms were consistent with the typical complaints or abdominal pain, vomiting, constipation and abdominal distension in various combinations. The commonest chief complaint was acute abdominal pain which was seen in as many as 95.0% cases, leaving only 10 cases with trauma who had other overwhelming presenting features. Nausea/vomiting was reported in 50.0% while obstipation and abdominal distension was complained of in 27.5% and 30.0% patients respectively.

The typical physical signs of intestinal perforation, accompanied by peritoneal fluid collection viz. abdominal distension, tenderness, guarding and rigidity, absent bowel sounds and free fluid in the abdominal cavity were elicited in all cases.

Peptic ulcer disease was the cause of perforation in 44.5% involving the stomach in 51 cases and duodenum in 38 cases. Typhoid accounted for 24%, all in the ileum. Acute appendicitis resulted in perforation of the appendix in 10% while trauma and tuberculosis accounted for 13 and 20 cases respectively. There was 5 case of malignancy and 2 case of volvulus. Two cases had non-specific. These studies find the ileum to be the most common site of involvement. The distribution in western countries showing a predominance of lower gut perforation appears to be a reflection of decreasing incidence of peptic ulcer disease and resultant

perforation of duodenum and stomach. Typhoid, the major cause of ileum perforation in countries like India, is hardly a cause in the West. On the other hand, malignancy, particularly of the large intestine, emerges as a common cause of perforation in the latter.

The operative procedures included primary repair of the perforation, primary repair with omental patch, resection with anastomosis, stoma (ileostomy or jejunostomy) or appendectomy depending on the clinical indication. In all peptic perforation primary repair was performed with figure of eight stitch method⁹. Post-operative wound complications occurred in 35.0% in the form of local infection, out of whom 30 developed wound dehiscence. Ten of these progressed to burst abdomen. Other morbidities that occurred in the postoperative period were in the form of systemic complications, the most frequent of which was respiratory 22.5%. The overall morbidity rate was 60.0% which is a relatively high figure and is partly contributed to by poor pre-operative general condition. Agarwal et al¹⁰ reported that major complications occurred in 25% of 260 operated cases, including burst abdomen in 11%, leak in 5%, and intraabdominal abscess in 5% and multi-organ failure in 6.5% cases. In a study of 59 patients with large bowel perforation and peritonitis undergoing emergency surgery, Bielecki et al¹¹ and Lalit et al¹² found that major complications were wound infection and dehiscence.

The mortality rate in this study was 14.5%. Gupta and Kaushik¹³ analyzed studies dealing with overall spectrum of secondary peritonitis in various countries of the Eastern region and reported an overall mortality ranging from 6% to 27%. In Indian studies, a large series of 260 cases by Agarwal et al¹⁰ reported an overall mortality of 10%, while it was found to be 7% in a retrospective study on 400 patients by Bali et al¹⁴ and 13% out of 77 cases by Yadav et al¹⁵.

Table 1: Age and gender wise distribution of patients.

age	Male (n=150)	Female (n=50)	Total (n=200)	percentage
<20	10	10	20	10%
20-39	60	35	95	47.5%
40-59	65	5	70	35%
>60	15	0	15	7.5%

Table 2: Mean age of patients.

gender	n	Mean +/-SD
Male	150	40.53+/-14.78
female	50	28.90+/-8.07
total	200	37.63+/-14.26

Table 6: Site of perforation in relation to etiology.

Site of perforation	Gastric (n=55)	Duodenum (n=40)	Jejunum (n=10)	Ileum (n=70)	Appendix (n=20)	Colon (n=5)	Total (n=200)
Peptic ulcer	51	38	0	0	0	0	89
typhoid	0	0	0	48	0	0	48
trauma	2	1	8	2	0	0	13
tuberculosis	0	0	2	18	0	0	20
appendicitis	0	0	0	0	20	0	20
malignancy	2	0	0	0	0	3	5
volvulus	0	0	0	0	0	2	2
Non specific	0	1	0	2	0	0	3

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Table 3: Sex distribution in relation to site of perforation.

Site of perforation	Male (150)	Female (50)	Total	Percentage
gastric	50	5	55	27.5%
duodenal	35	5	40	20%
Jejunum	5	5	10	5%
ileum	45	25	70	35%
appendix	10	10	20	10%
colon	5	0	5	2.5%

Table 4: Location of perforation at different sites.

Location of perforation	No of cases
Stomach	
antrum	6
Body	4
Pre-pyloric	45
Duodenum	
1 st part	38
2 nd part	2
3 rd part	0
Distance from IC junction	
10 cm	22
10-30 cm	28
>30 cm	20
Large intestine	
Ascending colon	2
Sigmoid colon	3

Table 5: Co-morbidities.

	No of cases
Hypertension	25
Old tuberculosis	30
Diabetes	13
Renal calculi	7
Cholelithiasis	2
PUJ calculi	3
BPH	2
HCV reactive	10

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