

Pattern and Etiology of Patients with Gastrointestinal Perforations: An Observational Prospective Study

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ABSTRACT

Introduction: Perforation peritonitis is the most common surgical emergency encountered all over the world. The objective of the study was to highlight the spectrum of perforation peritonitis as encountered in a tertiary care centre in Haryana.

Material and methods: It was observational prospective study of 100 cases of perforation peritonitis treated in the department of surgery. The maximum number of patients in the present study were in age group of 21-30 years (26%) with a mean age was 31 years. Male female ratio was 8.09:1.

Results: The most common etiology of perforation peritonitis was peptic ulcer disease (41%) followed by enteric fever (15%) and tuberculosis (13%). The most common site of perforation in this series was gastroduodenal (43%) followed by terminal ileum (30%). Mortality rate was 5% and significantly high in patients coming to the hospital after 24 hours.

Conclusion: Early recognition of symptoms and referral is very important in reducing mortality and morbidity.

Keywords: Peptic; Gastrointestinal Perforation; Peritonitis; Exploratory Laparotomy

sex presenting with pain in abdomen and suspected to have perforation peritonitis based on typical history and clinical findings were enrolled for the study.

All cases with primary peritonitis, perforation due to anastomotic dehiscence and patients having perforation that were not operated because of poor general condition and not cleared in pre-anesthetic evaluation (despite putting intra-abdominal drain) were excluded from the study.

All selected cases admitted to the emergency and outdoor department were identified and informed consent was obtained from the patient for inclusion in the study. Apart from patient's demographic profile, detailed history including time lag between onset of symptoms and presentation to hospital and clinical examination was recorded. Apart from local examination, systemic examination particularly, cardiovascular and respiratory system was also done.

Exploratory laparotomy was done by midline incision. All operative findings were recorded as per proforma. Post operatively, the patient was monitored either in general ward or HDU or ICU depending on patient's condition and availability of bed in high end areas. All data was collected in individual proforma. The data so collected was tabulated. A complete analysis was done and inferences were drawn.

RESULTS

A total of 100 patients were studied. Mean age was 31 years (range from 13 to 85 years) with majority of patients being males (89%) and the male female ratio was 8.09:1 with peptic ulcer patients having highest male female ratio.

The maximum number of cases of perforation belonged to 21 to 30 years age group (26%) with peptic ulcer being the commonest cause (7/26). Overall, peptic ulcer remains the most common etiology accounting for 41% of cases. The Youngest patient was a 13 year female with tubercular perforation and the oldest patient was also a tubercular

INTRODUCTION

Gastrointestinal perforations constitute one of the commonest surgical emergencies encountered by surgeons in India.^{1,2} The spectrum of etiology of perforation peritonitis continues to be different from that of western countries and there is limited data from India regarding its etiology, patterns of presentation, morbidity and mortality patterns.^{1,3}

Presentation to hospital in these cases vary depending upon access availability, patient awareness and, of course, economy and in late cases, established generalized peritonitis with purulent/fecal contamination and varying degree of septicemia.⁴

There is also a need to know all the patterns in which a case of perforation peritonitis could present and the different etiologies that leads to perforation peritonitis and the most common among them, so that the decision for appropriate management of such a case can be taken at the earliest and associated morbidity and mortality can be decreased. This study was done to evaluate various patterns of presentation of different gastrointestinal perforations on Clinico-radiological pattern, location of perforation and etiology based upon histopathology report

MATERIAL AND METHODS

This was a prospective study conducted in the Department of surgery Pt. B.D. Sharma Post Graduate Institute of Medical Sciences, Rohtak. A total of 100 subjects of both age and

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Age in years	Enteric		Peptic ulcer		Traumatic		Tubercular		Appendicular		Malignancy		cause not established		Total
	No. of cases	%age	No. of cases	%age	No. of cases	%age	No. of cases	%age	No. of cases	%age	No. of cases	%age	No. of cases	%age	
Upto20	1	1.0	3	3.0	-	-	3	3.0	2	2.0	-	-	-	-	9
21 to 30	6	6.0	7	7.0	4	4.0	3	3.0	3	3.0	-	-	3	3.0	26
31 to 40	3	3.0	10	10.0	1	1.0	2	2.0	2	2.0	-	-	2	2.0	20
41 to 50	3	3.0	9	9.0	-	-	1	1.0	2	2.0	1	1.0	3	3.0	19
50 to 60	-	3.0	7	7.0	2	2.0	-	-	1	1.0	1	1.0	1	1.0	12
>60	2	2.0	5	5.0	2	2.0	4	4.0	-	-	-	-	1	-	14
Total	15		41		9		13		10		2		10		

Table-1: Showing age incidence with respect to etiology

Etiology	Primary Repair	GPR	Resection and anastomosis	Appendicectomy	Ileostomy/Colostomy	Whipples	Distal gastrectomy and gastrojejunostomy
Enteric fever	5	0	1	0	9		
Peptic ulcer	0	41	0	0	0		
Traumatic	3	1	1	0	3	1	
Tubercular	2	0	3	0	8		
Appendicular	0	0		10	0		
Malignancy	0	0		0	1		1
Unknown	1	0	1	0	8		
Total	11	42	6	10	29	1	1

Table-2: Showing type of procedures with respect to etiology

Etiology	Cured	Expired	Mortality % age
Enteric fever (n=)	14	1	7.14
Peptic ulcer (n=)	39	2	5.12
Traumatic (n=)	9	-	0
Tubercular (n=)	13	-	0
Appendicular (n=)	10	-	0
Malignancy(n=)	2	-	0
Cause not established (n=)	8	2	25
Total	95	5	5.26

Table-3: Showing patient outcome

Authors	Year	Mortality rate (%)
Noguiera et al ²¹	2003	10.0
Gupta et al ¹⁰	2005	8.64
Agarwal et al ²²	2008	10.0
Present study	2017	5.0

Table-4: Showing comparison of mortality rates of our study with other studies is as shown above

perforation in a 85 year old male. Enteric perforation was more prevalent in age range of 20-40 years with 9 out of 15 cases.

Out of 100 cases which were studied, the most common etiology of perforation peritonitis was peptic ulcer disease (41 cases which includes perforation at both pylorus and 1st part of duodenum), the second most common etiology was enteric fever (15 cases) and other etiologies were tuberculosis (13 cases), appendicular perforations (10 cases), malignancy

(2 cases) and blunt trauma (9 cases). (Table 1)

Most of the patients (78%) reported after more than 24 hours of onset of symptoms. Only 22% cases reported within 24 hours of onset of symptoms.

In our study the most common site of perforation came out to be gastroduodenal (43 cases) followed by terminal ileum (upto 30 cm proximal to ileocaecal junction) which was seen in 30 cases (30%). Among gastroduodenal perforations, more common site being pylorus part of stomach (28 cases which includes cases due to peptic ulcer disease, malignancy and blunt trauma abdomen) followed by 1st part of duodenum (15 cases). Other sites were appendix (10 cases), jejunum (5 cases), colon (7 cases) and rectum (5 cases). In one of the cases of tubercular perforation, bowel was perforated at both jejunum and colon.

Acute abdominal pain was a symptom present in all the 100 cases. Other symptoms were vomiting (64%), abdominal distension (38%), and fever (22%). As far physical signs are concerned, every patient displayed abdominal tenderness in the present study. Rigidity and guarding was found in 82% of cases. Other signs observed were tachycardia (68%), shock (14%) and absence of bowel sounds (93%).

X-ray abdomen in erect position was done in all 100 cases. As already mentioned, pneumoperitoneum was detected in (79%) and multiple air-fluid levels with or without pneumoperitoneum was seen in (15%) cases. Similarly, the most common ultrasonographic findings were free fluid in the peritoneal cavity (90%) and dilated gut loops (19%

cases).Pleural effusion was present in 12% cases.

After optimization, exploratory laparotomy was done in 97 cases and exploration through a grid iron incision was done in 3 cases.

Upon exploration, foul smelling seropurulent fluid with or without flakes in the peritoneal cavity was observed in 56 cases, bilious fluid with or without flakes was observed in 25 cases, foul smelling fecal matter with or without flakes was observed in 14 cases, haemorrhagic fluid was observed in 5 cases.

In 30 cases terminal ileal perforation (upto 30 cm proximal to the ileocaecal junction on anti-mesenteric border) was observed. Twenty five patients had single perforation and five patients had multiple perforations. In 29 cases gastric perforation was observed, in all the cases perforation was single and present either in the pyloric region or on the anterior surface of the stomach. In 15 cases perforation was observed on the anterior wall of the first part of the duodenum. In 5 cases perforation was observed on the anti-mesenteric border of the jejunum while appendicular perforation was observed in 10 cases, colon perforation was present in 7 cases and rectal perforation in 5 cases.

In cases of tubercular perforations, tuberculous etiology was suspected per-operatively because tubercles were present over the mesentery, omentum and serosal surface of the gut. Adhesions between gut loops were also present. In 4 cases stricture distal to the perforation was present and in all possibilities this stricture was suspected to be tuberculous stricture.

The main aim of surgical intervention in such cases includes drainage of pus and bowel contents from peritoneal cavity and to prevent further contamination.

In all the cases of peptic perforation, after clearing and cleaning of peritoneal cavity, the edges were excised to freshen the margins and perforation was closed using Graham's Patch repair technique. In 9 cases of enteric perforation, where the gut was not healthy enough or there were multiple perforations or there was excessive soiling, ileostomy was done. Primary repair was done in 5 cases and resection and anastomosis in one case. In most of the tubercular perforations (8 cases), ileostomy/colostomy depending upon site of perforation was done. In rest of the cases, resection and anastomosis (3 cases) or primary repair (2 cases) was done.

All cases of appendicular perforations were subjected to appendectomy (all 10 cases). There were 10 cases of perforation peritonitis where even after histopathological examination, etiology could not be established. Out of these 10 cases, 3 had ileal perforation (and ileostomy was done in all of them), 2 patients had jejunal perforation and 2 had perforated colon. Remaining 3 patients had rectal perforation, where primary repair with covering loop ileostomy was done in all these 3 patients. Post-operatively patients were managed according to the standard of care.

Three out of nine cases of traumatic perforations were treated by primary closure of the perforation. In one case resection and anastomosis was required due to multiple perforations.

In 3 cases covering ileostomy/colostomy proximal to site of perforation after primary repair was done. In single case of traumatic peptic perforation, Graham's patch repair was done. In another case with traumatic duodenal perforation with pancreatic head transaction, Whipple's procedure was done. (Table 2)

E. coli was the most common organism isolated from cultures of peritoneal fluid of these patients. It was seen in 40.8% of cases. It was followed by KleibSELLA which was positive in 30.2% cases. Pseudomonas was seen in 5.3% cases whereas culture was sterile in 21.5% cases.

The overall mortality in the present study is 5%. The causes of mortality in the present series are very poor general condition of the patient at the time of admission, anemia, dehydration, associated co-morbidities and late reporting after the perforation. Two of these five cases were of peptic perforation and three have ileal perforation. All of these patients were in shock at time of presentation with deranged renal function tests and S. Electrolytes. All of these patients had presented after 48 hours of onset of symptoms. Further it was found that patients who presented within 24 hours of onset of symptoms, most of them (72.73%) were discharged within 10 days of admission, whereas 62.5% of patients, who presented after 72 hours, required more than 10 days of hospital stay.(Table 3)

DISCUSSION

Out of 100 cases which were studied, the most common etiology of perforation peritonitis was peptic ulcer disease followed by enteric fever, tuberculosis, appendicular perforations, malignancy and blunt trauma.The results of our study are in congruence with the studies of Jhobta et al¹, Gupta et al⁵, Vagholkar⁶ and Sharma et al.⁷ In their studies peptic perforation was the most common etiology followed by typhoid perforations. Khanna et al⁸ however, showed enteric fever as the most common cause (108 out of 204 cases). High incidence of peptic perforation were due to smoking and drinking habits of local population. Our study population constitutes rural population where there is excessive hukka smoking leading on to peptic perforation.

Although the most common site of perforation came out to be gastroduodenal but if stomach and duodenum are taken separately, terminal ileum (upto 30 cm proximal to ileocaecal junction) followed by pylorus part of stomach comes out to be most common site. The results are supported by Agarwal et al⁹ (most common site of perforation was ileum followed by duodenum).

Clinical presentation in the present study are well comparable with the study of Gupta et al¹⁰ where pain, vomiting, distension and fever presented in 100%, 80%, 66% and 20% respectively as well with the findings in the study of Hittunen et al¹¹ where all patients presented with signs of peritonitis, whereas Dickson et al¹² reported sign of abdominal tenderness in 97.3% cases and tachycardia in 92.1% cases.

These findings of x ray in which 79% cases had pneumoperitoneum matches with findings seen in the study

of Kapoor et al¹³ (76.9%) and Sofic et al¹⁴ (80%) whereas Dickson et al¹² and Aston et al¹⁵ reported free peritoneal gas in 40% and 25% cases respectively.

The standard management of these cases is resuscitation, optimization followed by surgery which was followed in present study also. Gupta et al¹⁰ and other authors have also recommended the omental patching in gastro duodenal perforations whereas Dickson et al¹² have recommended simple closure, if it is possible. In ileal perforation, Kim et al¹⁶ have recommended resection of small bowel in multiple typhoid perforations of the terminal ileum; but recommended exteriorization of the small bowel in very sick patients. Aston et al¹⁵ and Sweetman et al¹⁷ have suggested resection of the segment of ileum as the treatment of choice in case of tubercular perforations.

Gupta et al¹⁸ had also recommended the primary closure of the traumatic perforations as was done in 3 out of 9 cases in our study. Townsend et al¹⁹ had also recommended the primary closure of the traumatic perforations.

These findings of cultures of peritoneal fluid which showed E.coli as most common organism followed by klebsiella and pseudomonas are comparable with similar findings in the study of Gupta et al⁵ in which they had reported E. coli to be dominant pathogen isolated, ranging from 25–71%. This was followed by Klebsiella sp., and Pseudomonas sp. Sterile culture was encountered in 8–59.1%. Similar results were also reported by Kapoor et al²⁰ in their study on the role of enteric fever on ileal perforation and found E. coli to be the dominant isolate (23.4% cases).

Mortality rate in the present study is less than other studies. (Table 4) This may be because of early referral due to improved transport facilities and early intervention in tertiary care centre. Along with mortality, duration of hospital stay is also increased when patients present late to hospital. As was found in the present study that patients who presented within 24 hours of onset of symptoms, most of them were discharged early, whereas 62.5% of patients, who presented after 72 hours, required more than 10 days of hospital stay. Thus delay in presentation leading to various complications like dyselectrolyemia, sepsis and shock is an important cause that increases the morbidity of patient.

CONCLUSION

In contrast to western countries, where lower gastrointestinal tract perforation are common, upper gastrointestinal tract perforation constitute the majority of cases in India. The high rates of mortality among those who presented late invite attention to the fact that early diagnosis and management is very important to reduce mortality and morbidity in patients of gastrointestinal perforations.

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