



NON-TRAUMATIC GASTROINTESTINAL PERFORATIONS IN NORTH BIHAR -AN OBSERVATIONAL STUDY

General Surgery

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ABSTRACT

Background: Gastrointestinal perforations constitute one of the commonest surgical emergencies encountered by surgeons all over the world. However, non traumatic gastrointestinal perforations are more commonly seen in India. They cause considerable mortality and usually require emergency surgery. This study was designed to study the clinical spectrum of non traumatic gastrointestinal perforation in north Bihar and thereby assessing the surgical outcome. **Methods:** An observational study was conducted in the department of general surgery, Dmch, Darbhanga to analyse the clinical spectrum and their management protocol with outcome of the patients presenting with non traumatic gastrointestinal perforation. A total number of 60 patients of various etiologies of non traumatic gastrointestinal perforations were found to be treated over a period of 1.5 yr. Detailed demographic profile, clinical presentations and etiological factors were studied along with various management protocols offered to them with the outcome. **Results:** Most common age of presentation was 40-60 years with 80% being males. Most common site of perforation was duodenum (50%), appendix (20%), small bowel (13.33%), stomach (10%). Peptic ulcer (58%) was the predominant etiology followed by appendicular perforation (20%), enteric perforation (10%), tubercular (5%), malignancy (1.66%) and diverticula (5%). Most common post-operative complication was wound infection (33%) followed by dyselectrolytaemia (16.66%). Mortality was 13.33%. **Conclusions:** Gastrointestinal perforations constitute one of the commonest surgical emergencies. Non traumatic gastrointestinal perforations are quite common in north Bihar, India. The high rates of mortality among those, who present late, prompt an early diagnosis and active management protocol in order to reduce mortality and morbidity in such patients.

KEYWORDS

Duodenal perforation, Peritonitis, Laparotomy, Peptic ulcer

INTRODUCTION

Despite progress in surgical techniques, antimicrobial therapy and intensive care support, gastrointestinal tract perforation remains a condition associated with considerable mortality ranging from 10-30% (1).

Perforation can occur anywhere in the gastrointestinal tract starting from oesophagus to rectum (2).

The spectrum of etiology of perforation in north Bihar is different from other part of India.

Most of the patients in north Bihar present with perforation of the upper gastrointestinal tract whereas in the other part of India the distal gastrointestinal tract is generally involved (3).

Majority of cases present late in the hospital with well established generalized peritonitis and varying degree of septicemia (4).

Non traumatic gastrointestinal perforations as an entity have not received that much of importance as compared to perforations due to trauma or even malignancy.

Perforation is defined as an abnormal opening in a hollow organ or viscus. It is derived from the Latin perforatus, meaning "to bore through".⁵

Management of perforation peritonitis poses significant challenges to the treating surgeons with respect to surgical outcome thereby demanding thorough evaluation and appropriate management in such cases.⁶ Cases of non traumatic gastrointestinal perforations are very common in surgical practice in country like India in north Bihar. This study was aimed to analyze the clinical spectrum of non traumatic gastrointestinal perforations managed surgically in terms of clinical presentations, etiology, management and surgical outcome in terms of post-operative complications and mortality.

METHODS

The present study was an observational study conducted in the department of general surgery, Dmch, Darbhanga, Laheriasarai. The study was done after permission from the ethical committee and

research review board of the institute. A total number of 60 patients were included in this study, who were admitted and treated for non traumatic gastrointestinal perforations of various etiologies over a period from Oct 2023 to March 2025. Patients were selected for the study with following inclusion and exclusion criteria.

Inclusion Criteria

1. >10YR Of Age
2. Non traumatic GI Perforation and Going Emergency Laprotomy

Exclusion Criteria

1. >80 year of age
2. <10 year of age
3. Primary peritonitis,
4. Tertiary peritonitis following anastomotic leak.
5. Patients presenting with esophagus, pancreatobiliary tree, or genitourinary tract perforation.
6. Perforation following trauma.

Procedure

All patients admitted in the surgical wards with acute pain abdomen without any trauma were evaluated with detailed history of their illness with onset and duration of presenting symptoms. Past illness particularly relating to dyspepsia and any history of NSAID abuse was noted. Personal history especially for addictions like smoking and alcohol were recorded. After a general and abdominal examination suggesting peritonitis patients were subjected to investigations to confirm the diagnosis of perforation and to rule out any other cause. An X-ray erect abdomen and chest X-ray were obtained. A diagnosis of gastrointestinal perforation was made on the basis of history, clinical examination, and radiological evidence of presence of free gas under the diaphragm.

Ultrasound abdomen was done in all cases to look for any possible cause of peritonitis. Computed tomography scan was done in selected cases. Routine laboratory investigations were performed. After adequate resuscitation, patient was posted for exploratory laparotomy. Based on the intra operative finding further management was decided by the operating surgeon. Peritoneal lavage was done using warm saline of about 4-5L. Intra operative findings were recorded and the peritoneal fluid was sent for culture sensitivity. Biopsy was taken in required cases and sent for histopathological examination. All the

patients were managed postoperatively in surgical ward or surgical intensive care unit and postoperative complications including mortality were recorded. Data was entered in Microsoft Excel sheet and analyzed using proportions

RESULTS

A total of 60 patients were studied and the recorded findings were analyzed. The most common age group in the study population was between 40-60 years of age, comprising 55% of total cases (Table 1). Among 60 patients 40 patients were males and 20 patients were females. Male:female ratio was 2:1 (Table 1).

Table 1: Age and Sex Distributions (n=60).

Parameters	N	%
Age group (years)		
<20	10	16.66
21-40	8	13.33
41-60	33	55
61-80	7	11
>80y	02	0.033
Sex distribution	Male-40 Female -20	F:M=2:1

The most common clinical presentation was abdominal Pain seen in 48(80%) cases followed by Fever in 44 (73%) cases; vomiting in 42 (70%) cases; constipation in 33 (55%) cases; Abdominal distension 30(50%) cases. It was also observed that 10 (16%) cases presented with shock (Table 2).

Table 2: Mode of Clinical Presentations (n=60).

Presentation	N	%
Abdominal pain	48	80
Fever	44	73
Vomiting	42	70
Constipation	33	55
Abdominal distension	30	50
Shock	10	16

The most common site of perforation was duodenum seen in 30 (50%) cases; Appendix 12(20%); Small bowel 8 (13.33%) stomach in 6 (10%) cases; colon in 4(6.66%) cases, (Table 3).

Table; 3 Site of Perforation(n=60).

Site of perforation	N	%
Duodenum	30	50
Appendix	12	20
Small bowel (ileum and jejunum)	8	13.33
Stomach	6	10
Colon	4	6.66

Simple closure, repair of perforation with an omental patch, trimming of ulcer edge & closure, wedge excision and anastomosis, resection and anastomosis, and hemicolectomy were the various operative modalities performed for different pathology depending on the type and site of the perforations. Appendectomy was the procedure of choice in case of appendicular perforation. The details of operative procedures are depicted in (Table 4)

Table 4: Operative Procedures (n=60).

Site of perforation	Procedure	N	%
Duodenum	Graham's omental patch closure	30	50
Stomach	Edge biopsy+omental patch closure	06	10
Small bowel (ileum and jejunum)	Resection and anastomosis	6	10
	Perforation closure	02	3.33
Appendix	Appendectomy	12	20
	Hemicolectomy	03	5
	Hemicolectomy	03	5
Colon	Hartmann's procedure	01	1.66

Peritoneal fluid was sent for Gram stain and culture sensitivity in all cases. Among 60 cases bacterial peritonitis was seen in 42 (70%) cases, whereas fungal growth was isolated in 18 (30%) cases. In all the 60 cases, histopathological study was done from the perforation. The most common etiology of perforation was peptic ulcer, seen in 35 (58%) cases; appendicular perforation 12(20%); enteric perforation in 6 (10%) cases; tubercular in 03 (5%) cases; jejunal diverticula 03(5%) ;carcinoma colon in 01 (1.66%) cases.

Table 5: Etiology of Perforations (n=60).

	N	%
Peptic ulcer	35	58
Appendicitis	12	20
Enteric	06	10
Tubercular	03	5
Jejunal diverticulum	03	5
Etiology	01	1.66

Post operatively all the enteric perforation cases were treated with Ceftriaxone 2 gm i.v. 12 hourly. Tubercular perforation cases were subjected to anti tubercular treatment (ATT) for 06 months with 2EHRZ+4 HR regime followed by review after 06 months. Peptic perforation cases were treated with H pylori kit for 14 days followed by proton pump inhibitors (PPI) for 06 weeks.

Other bacterial peritonitis cases were treated with culture specific antibiotics. In this study, postoperative complications were seen in 30 (50%) cases, among which surgical site infection (33%) was the most common complication followed by dyselectrolytemia (16.66%), lung infection (8.33%), acute renal failure (13.33%), septic shock (8.33%), anastomotic leak (3.33%) and burst abdomen (3.33%). Mortality was seen in 08 cases (13.33%) (Table 6). Among 08 cases mortality was attributed to septic shock in 04 (6.66%) cases, fungal peritonitis in 03 (5%) cases and renal failure in 01 (1.66%) of cases. Mortality was high in cases of septic shock, where 03 patients out of 04 succumbed to death.

Table 6: Post-operative Complications (n=60).

Postoperative complications	N	%
Surgical site infection (SSI)	20	33
Dyselectrolytemia	10	16.6
Lung infection	05	8.33
Acute renal failure	08	13.33
Septic shock	05	8.33
Anastomotic leak	02	3.33
Burst abdomen	02	3.3
Death	08	13.3

DISCUSSION

Generalized peritonitis is one of the most common surgical emergencies.⁷ Gastrointestinal perforations have been classified into those of the upper gastrointestinal tract, comprising the stomach, duodenum and small intestine, and the lower gastrointestinal tract, comprising the appendix and large intestine.⁸ Management of perforation peritonitis not only requires prompt resuscitation measures and improved surgical strategies but also intensive postoperative care including disease specific treatment and maintenance of proper electrolyte balance; only then an improved outcome will be achieved.

In the present study, the most common age of presentation was in 4th and 5th decades of life, this is in accordance with a similar study done by Jain et al.⁴ Males were predominant in this study, with the male to female ratio being 2:1 which was similar to a 10 yrs study done by Agarwal et al where the male to female ratio was 2:1.⁴ In this study, the most common presenting complaint was abdominal pain associated with abdominal distension and tenderness. Patients presenting with shock were 10(16%) and these patients had poor outcome compared to others. The results were similar to a study done by Singla et al where the most common presenting complaint was acute abdominal pain and 14% of patients presented in shock.⁷

In the present study the most common site of perforation was duodenum (50%) followed by appendix (20%), small bowel (13%), stomach (10%) and large bowel (6.6%). This was similar to a study by Meena et al. where gastroduodenal (46.4%) was the most common site of perforation followed by small bowel (41%), appendix (8.1%) and large bowel (4.5%).⁵ More commonly the perforations involve the proximal part of the gastrointestinal tract; this being in contrast to studies from other part of India, where perforations are common in the distal part.³ Generalized peritonitis due to perforation of the small bowel is seen more commonly in the developing countries, where it is usually secondary to perforation of typhoid ulcers as seen in enteric fever in the present series. Nonspecific or idiopathic ulcer perforation and tubercular ulcer perforations are the next common cause in most of the series.^{7,9} Perforation of the terminal ileum constitutes the fifth most common cause of abdominal emergencies in other part of India.¹⁰ In this study the most common etiology of gastrointestinal perforation

was peptic ulcer disease (58%), followed by typhoid perforation (10%), tuberculosis (5%) and malignancy (1.66%). Appendicular perforations were seen in 20% cases. This was similar to a study done by Yadav et al in which the most common cause of perforation was peptic ulcer disease followed by typhoid perforation.¹¹ The first clinical description of a perforated peptic ulcer was made in 1670 in princess Henrietta of England. Since then several notable people have succumbed to this illness over the years.¹² In the advent of proton pump inhibitors and recognition of H. pylori as the most common etiology of peptic ulcer and appropriate medical management the advent of peptic ulcer perforations have decreased compared to previous days. Peptic ulcer disease is a problem of the gastrointestinal tract characterized by mucosal damage secondary to pepsin and gastric acid secretion. It usually occurs in the stomach and proximal duodenum; less commonly, it occurs in the lower esophagus, the distal duodenum, or the jejunum, as in unopposed hypersecretory states such as Zollinger-Ellison syndrome, in hiatal hernias (Cameron ulcers), in ectopic gastric mucosa (e.g., in Meckel's diverticulum).¹³

Typhoid intestinal perforation (TIP) is the most serious complication of typhoid fever. It has been reported in 0.8% to 39% of patients, with a striking difference between high-income and poor resources countries.¹⁴ An exhaustive study in India shows that enteric fever is responsible for nearly 87% of all non-traumatic small bowel perforations with mortality between 11% to 34%.¹⁵ In one of the Indian study the commonest cause of non-traumatic perforation of small intestine was found to be typhoid (46.4%), followed by non-specific inflammation (39.2%), tuberculosis (12.8%) and malignant neoplasm (1.6%).¹⁶ Also studies from the west have shown that around 15-20% cases are due to malignancy.⁶ This being in contrast to the present study, where malignancy was ascertained to be the cause of perforation peritonitis in only 1.66% of the cases. Tuberculosis was found to be the cause of perforation in 5% of cases in the present study. A diagnosis of tuberculosis was proven on histopathological examination of resected segments of intestine, edges of perforations, omentum and mesenteric lymph nodes showing epithelioid cell granulomas with Langhan's giant cells and caseation necrosis. The diagnosis of appendicitis and malignancy was confirmed by histopathological examination. In countries like India majority of cases of perforation were also attributed to infections. However increase in sanitation and hygiene and measures such as screening and use of appropriate antibiotics in correct time frame has led to decrease in the complications associated with these infections like enteric fever and tuberculosis.

Bacterial peritonitis was seen in 70% of cases and fungal peritonitis in 30% of cases in this study. This data was similar to study done by Singla et al. where bacterial growth was isolated in 76.3% of cases.⁷ The fungal peritonitis can be difficult to diagnose, as clinical manifestations (such as fever, abdominal pain, leucocytosis, cloudy exudates in the abdominal cavity, etc.) of mycotic and bacterial peritonitis are identical.¹⁷

In this study among 60 cases postoperative complications were seen in 50% of cases with wound infection being the most common complication followed by dyselethrolytemia, lung infection, acute renal failure, burst abdomen, anastomotic leak and death. The results were similar to a study done by Memon et al and Mukherjee et al.¹⁸ Morbidity from other post-operative complications ranges from 8.8% to 71.3% cases.¹⁹ Delay in operative intervention adversely affects the survival rate after surgery. Increasing the time interval between perforation and operation significantly increases the mortality ($p < 0.05$).²⁰ In the present study among 60 cases, mortality was seen in 8 (13.33%) cases. This data was similar to a study done by Doklestic et al where the mortality was 8.82% and Jhobta et al where mortality was 10%.²¹

CONCLUSION

The spectrum of perforation peritonitis in north bihar is different from other part of india with duodenal ulcer perforation, appendicular perforation, typhoid and tuberculosis being the major causes of generalized peritonitis. Early surgical intervention along with broad spectrum antibiotics supported by adequate aggressive resuscitation and correction of electrolyte imbalances followed by definitive treatment for infections like tuberculosis and enteric fever in immediate postoperative period, is essential for good outcomes minimizing morbidity and mortality.

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