



## Clinical presentation, etiological factors, management and outcome of hollow viscus perforation

<sup>1</sup>Dr. Bhagavan B C, <sup>2</sup>Dr. R Ganesh Kumar\*, <sup>3</sup>Dr. Pratha, <sup>4</sup>Dr. Nabagata, <sup>5</sup>Dr. Shashank

<sup>1</sup>Professor, Department of General Surgery, KIMS, <sup>2</sup>Senior resident, Department of general Surgery, <sup>3,4,5</sup>Junior resident, Department of General Surgery

**\*Corresponding Author:**

**Dr. R Ganesh Kumar**

Senior Resident, Department of General Surgery.

Type of Publication: Original Research Paper

Conflicts of Interest: Nil

### Abstract

#### Background:

Hollow viscus perforation is one of the causes of acute abdomen warranting emergency laparotomy. Perforation of hollow viscus occurs at various sites of gastrointestinal tract due to a wide spectrum of etiologies, Benign causes of gastrointestinal perforation is most common.

**Aims & Objectives:** The aim is to study various clinical presentation, etiological factors, anatomical distribution of hollow viscus perforation management and post-operative complications of operative management.

**Methods:** This prospective study was conducted on 54 patients who were diagnosed with hollow viscus perforation from July 2019-December 2021 in Kempegowda institute of medical sciences, Bangalore. Diagnosis was established by careful history taking, complete clinical examination, radiological evidence and managed by definitive surgery and post-operative complications were recorded and assessed.

**Results:** In our study 54 patients who presented with hollow viscus perforation 36 were duodenal perforation, 14 were gastric perforation, 2 were jejunal perforation, 2 were ileal perforation. Male: female ratio in hollow viscus perforation is 2.3:1. Most patients in our study were in age groups of 20-40 years. Peptic ulcer disease due to smoking followed by analgesic abuse found to be most common cause of perforation. The most common symptom was abdominal pain which was present in all the patients. Post-operative complications occurred in 55.5% of the patients.

**Conclusion:** Hollow viscus perforations cause significant morbidity and sometimes mortality. Clinical presentation and etiological factor of perforation varies depending on the site of perforation. Duodenal perforation found to most common cause and smoking found to be most common cause in our study. Early operative intervention and good post-operative care, can help reduce morbidity and mortality. Morbidity and mortality were higher in the elderly and in the patient presented late to the hospital.

**Keywords:** Perforation, emergency, Morbidity, Mortality.

### INTRODUCTION

Perforation of any part of gastrointestinal is a life-threatening emergency. A high index of suspicion is essential to diagnose visceral perforation early as significant morbidity and mortality results from diagnostic delay.<sup>1</sup> The various atypical presentations that mimic other abdominal conditions throw a

real challenge over the diagnosis to the emergency surgeon. A careful medical history, methodical clinical examination, and radiological study play a major role in the early diagnosis of this acute abdominal emergency. There are multiple factors that influence the prognosis and outcome of the patient.

Pre-operative resuscitation, IV administration of broad-spectrum antibiotics, and good postoperative care are the mainstay in the management of gastrointestinal perforations. The operative management depends on the cause of perforations<sup>2</sup>. In western countries where distal perforations are more common<sup>3</sup>

Rajender Singh Jhobta et al in their study concluded that majority of perforation peritonitis in India involve Upper Gastro-Intestinal tract<sup>14</sup>...Most ulcer perforations are related to smoking and NSAIDS<sup>5</sup>. Bali et al in their study conducted in Delhi found that 15% of patients gave history for NSAID intake<sup>6</sup>. Factors contributing to perforation peritonitis in South India can be different from that of North India because of different culture, food habits, health care facilities and awareness

### Aims and objectives

1. To study the age and gender distribution.
2. Clinical presentation and common etiological factors of perforation
3. To study the anatomical distribution of hollow viscous perforation.
4. To study the commonest operative procedure performed for various etiologies.
5. To study the post-operative complications of operative management.

### Materials and Methods

This prospective study was conducted over 18 months from July 2019 to December 2021 on 54 patients with hollow viscus perforation. patients were subjected to careful history taking, including age, sex, occupation, duration of the symptoms, smoking, alcohol consumption, NSAIDs, weight loss. Vitals were recorded. The patients were submitted to complete clinical examination and the following laboratory and radiological investigations. Erect X-ray abdomen – to look for air under diaphragm. Ultra-sonogram of abdomen to look for free fluid. Routine blood and urine tests. Nasogastric tube was secured. Pre-operative antibiotics were administered. Under general anesthesia explorative laprotomy followed by Primary closure with peritoneal lavage, bowel resection and end to end anastomosis was done after locating the perforated site by inspecting the alimentary tract. Postoperatively antibiotics were

administered and patients were followed up to watch for complications like surgical site infection, wound dehiscence, anastomotic leak.

### Results

In our study 54 patients who presented with hollow viscus perforation 36 were duodenal perforation, 14 were gastric perforation, 2 were jejunal perforations<sup>2</sup> were ileal perforation.

**Table 1: Age distribution.**

Age	No. of patients	Percentages
<20	4	7%
21-40	38	70%
41-60	9	16%
>60	3	5%

Maximum number of patients (38) were in the age group of 20 to 40 years, followed by 9 patients in 41 to 60 years. The youngest patient in this study was 14 years, who had ileal perforation, has old history of crohns disease on treatment with steroids and the oldest patient was 64 years who is a chronic smoker.

**Table 2: Sex distribution.**

Sex	No. of patients	Percentage
Male	38	70.4%
Female	16	29.6%
Total	100	100%

In present study there were 38 male patients (70.4%) and 16 female patients (29.6%). Male to female ratio is 2.3:1

**Table 3: Clinical presentation**

Symptoms and signs	No. of patients	Percentage
Fever	40	74%
Pain abdomen	54	100%
Vomiting	46	85%

Constipation	29	53%
Diarrhoea	15	27%
Right iliac fossa tenderness	3	5.5%
Guarding	54	100%
Obliterated liver dullness	30	55%
Bowel sound absent	25	46%
Shock	4	7.4%

The most common symptom was abdominal pain with guarding, which was present in all the patients. Vomiting was second most common symptom and was present in 46 patients (85%). Fever was present in 40 patients (74 %) and was the third most common symptom. Three patients had right iliac fossa tenderness. Intra operatively 2 patients had ileal perforation, one patient had gastric perforation with collection around in right iliac fossa. Out of 4 patients presented with shock 2 patients died postoperatively due to sepsis and shock, 2 patients developed postoperative leak. one patient managed conservatively and other patient required re surgery and diversion procedure.

**Table 4: Site of perforation.**

Site	No. of cases	Percentage
Duodenum	36	66%
Gastric perforation	14	26%
Typhoid ileal perforation	1	2%
Ileum	1	2%
Jejunum	2	4%

Duodenum (66%) was the commonest site for perforation. Other sites in the order of frequency were stomach (26%), ileum (4%), jejunum (4. %), Peptic ulcer disease due to smoking (30 patients) (55%) and drug intake (18 patients) (33%) was the commonest etiology for perforation. Ileal perforation was present in 2 patient one with ileocaecal tuberculosis and other with history of typhoid before 2 weeks. Two patients

had jejunal perforation had a history of crohns disease. In 2 patients the cause is not known, Biopsy was taken from the 2 patients with idiopathic gastric perforation, and in one patient the histopathology was reported to be malignancy and definite re procedure was done.

**Table 5: Etiology and site of perforation**

Etiology	Duodenal	Gastric	Ileal	Jejunum
Drug intake	16	2		
Smoking	20	10		
Typhoid			1	
TB			1	
Crohns disease				2
Idiopathic	0	2		

**TABLE-6: Duration of Perforation (Time interval between onset of symptom and hospital admission)**

Duration	Patients	Percentage
<24hrs	28	51%
24-48hrs	14	25%
48-72hrs	8	14%
>72hrs	4	7%

In our study 75% percent of patient presented within 48 hrs of symptoms had early peritonitis with minimal contamination and are operated and are discharged uneventfully. patient admitted within 72 hrs had minimal postoperative complications like surgical site infections which are managed accordingly. 4 patients presented after 72 hrs had profound shock, 2 patients died immediate postoperatively due to profound shock due to sepsis. Another 2 patient developed postoperative bile leak with enterocutaneous fistula. One patient developed low output fistula which was managed conservatively.

and other patient had high output fistula underwent definitive diversion procedure.

**Table 7: Diagnosis and surgical procedure.**

Diagnosis	Surgical procedure	No. of patients adopted
Duodenal ulcer	Closure of perforation with omentum and peritoneal lavage	36
Gastric	Closure of perforation with omentum and peritoneal lavage	14
Ileal perforation due to tuberculosdis	Excision of 1.5 feet of terminal ileum with ilio transverse end to side anastamosis with peritoneal lavage	1
Ileal perforation due to typhoid fever	Small perforation less than 5mm- primary closure with peritoneal lavage	1
Jejunal perforation due to crohns disease	Closure of perforation with omentum and peritoneal lavage	2

Patients included in this study were managed according to the standard protocol. Preoperative resuscitation in cases of shock and correction of electrolyte abnormality were carried out in all patients. After preoperative treatment all cases were subjected to laparotomy and the primary cause was identified and treated accordingly.

**Table 8: Surgical outcome**

Complications	Number of patient
Surgical site infection	24

Wound dehiscence	4
Post-operative bile leak with fistula	2

Surgical site infection is the most common complication in 44% of patient which are managed conservatively with drainage of collection, antibiotics and secondary suturing. Four patients (7.4%) developed wound dehiscence which are managed with tension suturing. 2 patient developed bile leak with fistula. one patient had low output fistula which is managed conservatively and another patient underwent definite reoperation.

#### Mortality

2 patients (3.7%) succumbed due to severe sepsis.

#### DISCUSSION

Our study is included 54 patients conducted over a period of one and a half years. The commonest age group in this study was 21-40(70%) years. Afridi et al who conducted similar study found that the mean age of patients with peritonitis due gastrointestinal perforation was 40.5 years<sup>4</sup>. Out of 55 patients, 38(70.4%) were males and 16(29.6%) were females with sex of 2.3:1. Males were seen to predominate in incidence in all the studies<sup>8-10</sup>. The highest male preponderance was noticed by Jhobta et al, where the ratio of male to female was 5.2:1, followed by Yadav et al where the ratio was 4.9:1. Afridi et al<sup>4</sup> showed ratio of 2.1:1 which was nearing our study in which the ratio was 2.3:1. Abdominal pain was most common symptom and was found in all the patients followed by vomiting which was present in 46 patients (85%). Bali et al<sup>6</sup> in their study found that abdominal pain was present in 98% of the patients. 30 patient (55%) who had peptic ulcer perforation were smokers and smoking was significantly associated with peptic ulcer perforation in this study followed by drug intake mostly NSAIDs abuse in 18 patients (33%). Smoking is known to have several adverse effects on the upper gastrointestinal tract<sup>10</sup>. Smoking causes immediate vasoconstriction in the mucosa<sup>11</sup>. Ischemia reduces mucosal resistance<sup>12</sup> against, for instance the action of acid and may thus contribute to ulcer perforation. Eighteen patients (33%) who had peptic ulcer perforation had history of NSAIDs intake. Various studies have shown association between peptic ulcer disease and NSAIDs. Ohene -yeboah et al in their study they found 47% of patients had history of



NSAID intake<sup>13</sup>. In the recent times the discovery of PPIs and other antacids have reduced the incidence of perforations due to acid peptic disease. Perforations due to peptic ulcer disease were seen to be the most common cause of perforations consistently in most of the studies. In this study we had 74% of patients having perforation at the gastro-duodenal region. This was similar with the studies by Jhobta et al<sup>14</sup>, Afridi et al<sup>4</sup> and Yadav et al<sup>15</sup>. Duodenal ulcer perforation was present 66%, gastric ulcer perforation was found in 26%. Dokubo et al in their study found that 88% of the peptic ulcer perforations were found in duodenum and 12% were found in stomach<sup>15</sup>. Graham's omental patch repair was the performed in all the patients with gastr oduodenal perforation. Leeman et al in their study 91% of gastric ulcer was treated with graham's omental patch and large perforations more than 2cm was treated either by simple closure (4.5%) or distal gastrectomy (4.5%)<sup>17</sup>. Malignant gastric perforation was found in 1 patient (1.8 %). patients under went graham's omental patch repair in emergency surgery. Definitive procedure was deferred due to poor general condition. Intestinal tuberculosis was cause of gastrointestinal perforation in 1 patient (1.8%) patient underwent resection of the segment followed by ileo transverse anastomosis. Abro et al in their study conducted in Pakistan found that perforation of ileum in intestinal tuberculosis was present in 10% of the patients<sup>18</sup>. Thirty patients (55.5%) developed post-operative complications. 24 patients (44%) developed superficial surgical site infection. Four patients (7.3%) developed wound dehiscence and 2 of the patients (3.7%) with had leak from the perforation closure site. Sepsis or septic shock was seen in 7.4 % of the patients in this study. This study had a mortality rate of 3.7% which was quite less as compared to the other studies such as Jhobta et al<sup>14</sup> (21) reported a mortality of 10% which was quite close with that of Afridi et al<sup>4</sup>(10.6%) (22) because of smaller sample size.

## CONCLUSION

Peptic ulcer disease was found to be the most common cause of perforation peritonitis in contrast to western world where perforation due inflammatory disease and malignancy is common. Duodenal ulcer perforation was the most common followed by gastric, ileum and jejunum with male preponderance. . Abdominal pain with guarding is the most common clinical presentation followed by vomiting and fever. More common in the 20-40 years of age. Smoking is the

most common cause in our study (male preponderance) followed by drug intake (NASIDs abuse), tuberculosis, typhoid, and crohns disease. Surgical treatment is the most definitive treatment for perforative peritonitis patients and post-operative care remain extremely important in the better outcome of the patients. Simple closure with omenta l patch with thorough peritoneal toileting was very much effective in most of perforation. Morbidity and Mortality were more in patients with delayed presentation. Surgical site infection is the most common post-operative complication, followed by wound dehiscence and enterocutaneous fistula. Early recognition of perforation, prompt surgical intervention, adequate drainage, good post-operative care and management of complications would help reduce morbidity and mortality.

## REFERENCES

1. Vinod KB, Mathew AS. Clinical study of abdominal hollow visceral perforation-non traumatic. Journal of Evolution of Medical and Dental Sciences. 2014 Jul 28;3(30):8366-72.
2. Kumar KS, Vattegunta B. The clinical presentation and Management of Hollow viscus perforation. IJSS journal of surgery. 2018 Jan 30;4(1):30-6.
3. Chakma SM, Singh RL, Parmekar MV, Singh KG, Kapa B, Sharatchandra KH, et al. Spectrum of Perforation Peritonitis. J Clin Diagn Res JCDR. 2013;7(11):2518.
4. Afridi SP, Malik F, Ur-Rahman S, Shamim S, Samo KA. World Journal of Emergency Surgery. World J Emerg Surg. 2008; 3:31.
5. Svanes C, Søreide JA, Skarstein A, Fevang BT, Bakke P, Vollset SE, Svanes K, Søreide O. Smoking and ulcer perforation. Gut. 1997 Aug 1;41(2):177-80.
6. Bali RS, Verma S, Agarwal PN, Singh R, Talwar N. Perforation Peritonitis and the Developing World. IntSch Res Not [Internet]. 2014 [cited 2014 Aug 13];2014. Available from: <http://www.hindawi.com/journals/isrn/2014/105492/abs/>
7. Sui WT. 2004. "Routine use of laparoscopic repair for perforated peptic ulcer". Br J Surg., 91: 481-484.

8. Thal ER. 1990. "Abdominal trauma". The surgical clinics of north america, W.B. Saunders Co., 70: 517-575.
9. Turner WW. 1988. "Perforated gastric ulcer a plea for management by simple closure". Arch Surg., 123: 960 -964.
10. Eastwood GL. The role of smoking in peptic ulcer disease. *J Clin Gastroenterol* 1988; **10** (suppl 1): S19–23
11. Iwao T, Toyonaga A, Ikegami M, Oho K, Sumino M, Sakaki M, *et al*. Gastric mucosal blood flow after smoking in healthy human beings assessed by laser Doppler flowmetry. *Gastrointest Endosc* 1993; **39**: 400–3.
12. Sørbye H, Svanes K. The role of blood flow in gastric mucosal defence, damage and healing. *Dig Dis* 1994; **12**: 305–17.
13. Ohene-Yeboah M, Togbe B. Perforated gastric and duodenal ulcers in an urban African population. *West Afr J Med*. 2006 Sep;25(3):205–11.
14. Jhobta RS, Attri AK, Kaushik R, Sharma R. 2006. "Apectrum of perforation peritonitis in India – review of 504 consecutive cases" *World J Em Surg.*, 1: 1186-1749.
15. Yadav D, Garg P. 2013. "Spectrum of perforation peritonitis in Delhi: 77 Cases Experiemce" *Indian J Surg.*,75(2):133-137.
16. Dakubo JCB, Naaeder SB, Clegg-Lampthey JN. Gastro-duodenal peptic ulcer perforation. *East Afr Med J*. 2009 Mar;86(3):100–9.
17. Leeman MF, Skouras C, Paterson-Brown S. The management of perforated gastric ulcers. *Int J SurgLond Engl*. 2013;11(4):322– 4
18. Abro A, Siddiqui FG, Akhtar S, Memon AS. Spectrum of clinical presentation and surgical management of intestinal tuberculosis at tertiary care hospital. *J Ayub Med Coll Abbottabad JAMC*. 2010 Sep;22(3):96–9.