

# Managing Peritonitis Secondary to Hollow Viscus Perforation: An Analysis of Perioperative Complications at a Tertiary Care Centre

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**Abstract****Background**

Peritonitis caused by hollow viscus perforation is a life-threatening condition that requires emergency surgical care and is associated with high rates of morbidity and mortality. Therefore, the operating surgeon faces a challenge to provide appropriate management that can lead to a better outcome. As a result, a thorough evaluation is necessary.

**Method** From August 2020 to July 2021, a study was conducted at IMS BHU. The study involved analysing data from 192 cases of peritonitis caused by hollow viscus perforation. The study focused on identifying the causes of the condition, surgical interventions, and peri-operative complications. Appropriate statistical analyses were performed to draw conclusions.

**Result** Of the 192 cases analysed, males accounted for 154 while females were 38 with an average age of 45 years. The primary cause of peritonitis was gastric ulcer (GU) perforation, followed by idiopathic, infective, malignancy, appendicular perforation, and trauma.

**Conclusion** The outcomes of surgical emergencies related to hollow viscus perforation depend on various factors such as age, overall health, site of perforation, co-existing medical conditions, and underlying causes.

**Keywords:** Perforation, tertiary institute, surgical management.

## INTRODUCTION

Peritonitis caused by hollow viscus perforation is a major global health issue that can lead to both mortality and morbidity (1,2). This life-threatening condition requires emergency surgical care, particularly in developing countries where it is more prevalent. Surgical treatment outcomes and associated post-operative complications vary depending on the severity of the condition and the procedures involved (3,4). Therefore, proper evaluation and management are necessary to improve outcomes, which can be challenging for surgeons. This study aims to evaluate the epidemiology, surgical management, complications, and outcomes of peritonitis caused by hollow viscus perforation in India, which differs from that in Western countries. In the past, acid peptic disease was thought to be the main cause of gastric and duodenal perforations, particularly in the Western world. However, with the appropriate use of proton pump inhibitors, the incidence of acid peptic disease has decreased. Despite this, gastric and duodenal perforations remain the leading cause of peritonitis secondary to hollow viscus perforation in the overall incidence of gastrointestinal perforations. The aim of this study were to examine the causes, surgical treatment, and complications during the perioperative period of peritonitis caused by hollow viscus perforation (5,6).

## Material and method

Between August 2020 and July 2021, a retrospective observational study was conducted in our hospital, a tertiary care centre. The study included 192 patients with generalized peritonitis resulting from hollow viscus perforation who presented to the emergency department of general surgery. The data collected included the patients' gender, diagnosis, operative procedure, and perioperative complications that occurred within the first 3 weeks after surgery. Patients with primary bacterial peritonitis, peritonitis caused by postoperative leakage, and those with immunodeficiency were excluded from the study. The study used appropriate descriptive statistical analysis with the SPSS software. The ethical committee approved the study protocol.

## Result

The study included a total of 192 patients with generalized peritonitis caused by hollow viscus perforation. Of these patients, 40% were between the ages of 20 and 40 years, with 80% being male and 20% female. The most common cause of peritonitis was peptic ulcer disease, which had an incidence of 34%, followed by idiopathic causes at 28%, typhoid at 15%, malignancy at 9%, appendicular perforation at 8%, and itrogenic at 6%. The most common site of perforation was found to be in the gastric area at 29%, followed by duodenal 22%, ileal perforations at 20% each, large bowel at 13%, appendicular at 9%, and jejunal at 7%. After initial resuscitation, primary closure was performed in 96 cases (50%), while resection and anastomosis were performed in 48 cases (25%), and resection and diversion were performed in 38 cases (20%). In 10 cases (5%), an appendicectomy was performed. Patients were regularly followed up for a period of 3 weeks after surgery and assessed accordingly (Table-1)

Out of the total patients, 10 (5%) patients had died and 96 (50%) had experienced complications (as presented in Table 1). 86 (45%) patients did not experience any complications. The most frequently observed complication was wound infection which occurred in 36 patients (19%), followed by abdominal dehiscence in 22 patients (11%),

paralytic ileus in 20 patients (10%), bronchopneumonia in 10 patients (5%), fecal fistula in 6 patients (3%), and abdominal abscess in 4 patients due to anastomotic leak (2%). The majority of mortality cases occurred between the age group of 50 to 80 years. Out of the 10 patients who died, 6 had uncontrolled diabetes, 3 had COPD with a history of chronic smoking, and 1 patient of 45 years of age had alcoholic liver disease. In comparing the incidence of complications with the site of perforation, it was observed that patients with ileal perforation who underwent diversion stoma had a higher incidence of wound infection at 60%. On the other hand, patients with appendicular perforation had the least incidence of wound infection at 7%. In patients with large bowel perforation, postoperative ileus was more common.

<b>Causes</b>	<b>(%)</b>	<b>No.</b>
Peptic ulcer disease	34%	65
Idiopathic causes	28%	53
Typhoid	15%	30
Malignancy	9%	17
Appendicular perforation	8%	15
Itrogenic	6%	12
<b>Site of perforation</b>	<b>(%)</b>	<b>No.</b>
Gastric	29%	56
Duodenal	22%	42
Ileal	20%	38
Large bowel	13%	25
Appendicular	9%	17
Jejunal	7%	14
<b>Complication</b>	<b>(%)</b>	<b>No.</b>
Wound infection	19%	36
Abdominal dehiscence	11%	22
Paralytic ileus	10%	20
Bronchopneumonia	5%	10
Fecal fistula	3%	6
Anastomotic leak	2%	4

Table 1

### Discussion

In India, perforative peritonitis is now predominantly caused by peptic ulcer disease, whereas previous studies have shown that infection plays a major role in etiology with typhoid causing 15% of cases (7-14). Distal gastric perforation was the most common followed by duodenal perforation. The incidence of malignancy as a cause of hollow viscus perforation is also increasing with an incidence rate of 9% in this study (15,16). Infectious etiology was more common in female patients. In contrast to previous studies in the West, where generalized peritonitis secondary to hollow viscus perforation was common in younger age groups, studies in tropical countries have shown

that it is more common in the 4th-5th decade. This study found that the mean age group was 45 years, with a higher incidence in males than females (17-20).

### Conclusion

Perforation of hollow organs is a frequently encountered surgical emergency, and the outcome of surgery and its associated complications are influenced by several factors including age, general health, location, co-existing illnesses, and the underlying cause, which can vary in pathophysiology between tropical and western countries. There has been an observed rise in the incidence of malignancies in this context.

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### **2. Competing Interests**

The authors have no relevant financial or non-financial interests to disclose.

### **3. Data Availability**

The datasets generated during and/or analysed during the current study are not publicly available due to institutional policy but are available from the corresponding author on reasonable request.

### **4. Ethics approval**

This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Ethics Committee of the University.

### **5. Consent to participate**

Informed and written consent was obtained from all individual participants included in the study.

### **6. Author contributions**

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by Dr. Rohit Kumar Singh, Dr. Sweta Singh, Dr. Puneet and Dr. Ajay K Khanna. The first draft of the manuscript was written by Dr. Rohit Kumar Singh and all authors commented on previous