

Retrospective Study of Perforative Peritonitis and Its Clinical Outcomes among Patients Undergoing Emergency Laparotomy at a Tertiary Care Teaching Hospital: A Retrospective Observational Study

Senthan Amudhan K. P.¹, K. Murugan², C. Deepak Vellingiri Raj³

¹Professor, Department of General Surgery, Government Erode Medical College and Hospital, Perundurai, Erode, Tamil Nadu, India.

²Resident, Department of General Surgery, Government Erode Medical College and Hospital, Perundurai, Erode, Tamil Nadu, India.

³Resident, Department of General Surgery, Government Erode Medical College and Hospital, Perundurai, Erode, Tamil Nadu, India.

Received: 01-05-2026 / Revised: 15-06-2026 / Accepted: 21-07-2026

Corresponding author: Dr. Senthan Amudhan K. P.

Conflict of interest: Nil

Abstract

Background: Perforative peritonitis is one of the most common life-threatening surgical emergencies encountered in general surgical practice. It results from perforation of the gastrointestinal tract, leading to contamination of the peritoneal cavity, severe inflammatory response, sepsis, and multiorgan dysfunction if not treated promptly. Despite significant advances in diagnostic imaging, antimicrobial therapy, critical care, and surgical techniques, perforative peritonitis continues to be associated with considerable morbidity and mortality, particularly in developing countries where delayed presentation and limited healthcare access remain common. Understanding the demographic characteristics, etiological spectrum, operative findings, surgical management, and postoperative outcomes is essential for improving patient care and optimizing treatment strategies.

Aim: To evaluate the demographic profile, etiological factors, anatomical sites of perforation, surgical management, postoperative complications, and clinical outcomes among patients with perforative peritonitis undergoing emergency laparotomy at a tertiary care teaching hospital.

Materials and Methods: A retrospective observational study was conducted in the Department of General Surgery, Government Erode Medical College and Hospital, Tamil Nadu, India. Hospital records of 50 patients who underwent emergency surgery for perforative peritonitis during the study period were reviewed. Data regarding demographic characteristics, clinical presentation, operative findings, etiology, anatomical site of perforation, surgical procedures performed, postoperative complications, and clinical outcomes were collected using a structured data collection form. Descriptive statistics were used to summarize the data. Continuous variables were expressed as mean $\pm$ standard deviation where appropriate, while categorical variables were presented as frequencies and percentages. Statistical analysis was performed using SPSS version 26.0, and a p-value <0.05 was considered statistically significant.

Results: A total of 50 patients were included in the study. The majority belonged to the 31–40-year age group (30%), followed by the 21–30-year age group (24%). Male patients constituted 56% of the study population. Peptic ulcer perforation was the most common etiology, accounting for 36% of cases, followed by traumatic perforation (24%), appendicular perforation (22%), tubercular perforation (10%), while iatrogenic perforation and enteric (typhoid) perforation each accounted for 4% of cases. The duodenum was the most frequently involved anatomical site (48%), followed by the ileum (20%), jejunum (20%), and appendix (12%). Primary repair was the most commonly performed surgical procedure (70%), whereas stoma formation was undertaken in 30% of patients. More than half of the patients (52%) developed one or more postoperative complications, with surgical site infection (24%) being the most common complication, followed by sepsis (16%), respiratory complications (14%), wound dehiscence (12%), and intra-abdominal abscess (10%).

Conclusion: Perforative peritonitis remains a major surgical emergency associated with substantial postoperative morbidity. Middle-aged males constituted the majority of affected patients, and peptic ulcer disease was the leading cause of gastrointestinal perforation. Early diagnosis, aggressive resuscitation, timely surgical intervention, appropriate antimicrobial therapy, and meticulous postoperative care are essential for improving clinical outcomes and reducing postoperative complications.

Keywords: Perforative Peritonitis, Emergency Laparotomy, Peptic Ulcer Perforation, Intestinal Perforation, Surgical Site Infection, Postoperative Complications.

DOI: 10.25258/ijcpr.18.8.17

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access

Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

Perforative peritonitis is one of the most serious surgical emergencies encountered worldwide and continues to pose a significant challenge despite advances in modern surgical practice. It occurs following disruption of the gastrointestinal tract, allowing leakage of gastrointestinal contents into the peritoneal cavity, resulting in diffuse peritoneal inflammation, bacterial contamination, sepsis, and, if untreated, multiorgan dysfunction and death[1]. Emergency surgical intervention combined with aggressive resuscitation and broad-spectrum antimicrobial therapy remains the cornerstone of successful management [2].

The epidemiology of perforative peritonitis varies considerably across different regions of the world. In developed countries, lower gastrointestinal perforations secondary to diverticular disease, colorectal malignancy, and inflammatory bowel disease are more frequently encountered[3]. In contrast, upper gastrointestinal perforations due to peptic ulcer disease continue to predominate in developing countries, including India[4]. Enteric fever, intestinal tuberculosis, abdominal trauma, appendicular perforation, and iatrogenic injuries also contribute significantly to the disease burden in South Asia[5].

Patients with perforative peritonitis commonly present with sudden onset of severe abdominal pain, abdominal distension, vomiting, fever, constipation, tachycardia, hypotension, guarding, rigidity, and signs of generalized peritonitis[6].

Delayed presentation frequently leads to septic shock, electrolyte imbalance, acute kidney injury, respiratory complications, and multiple organ dysfunction syndrome, thereby increasing morbidity and mortality[7].

Early recognition, prompt fluid resuscitation, initiation of empirical broad-spectrum antibiotics, and timely emergency laparotomy are therefore essential for improving patient survival[4].

Radiological investigations such as erect abdominal radiography and contrast-enhanced computed tomography facilitate rapid diagnosis by demonstrating pneumoperitoneum, free intraperitoneal fluid, and the site of gastrointestinal perforation[2]. The choice of surgical procedure depends on several factors, including the anatomical location of the perforation, degree of peritoneal contamination, viability of the bowel, underlying pathology, physiological status of the patient, and surgeon's expertise[8]. Procedures commonly performed include primary closure, omental patch repair, resection with anastomosis,

exteriorization, or stoma formation[1]. Postoperative complications remain common following emergency surgery for perforative peritonitis[9]. Surgical site infection, intra-abdominal abscess, wound dehiscence, respiratory complications, sepsis, prolonged hospital stay, and mortality continue to represent significant challenges, particularly among patients presenting late or with severe intra-abdominal contamination[10-11]. Identification of the prevailing etiological factors and postoperative outcomes in individual institutions is therefore important for optimizing management strategies and improving healthcare delivery.

Although numerous studies have evaluated perforative peritonitis, considerable regional variations exist regarding the underlying etiology, anatomical distribution, operative management, and postoperative outcomes. Institution-specific data are essential to understand local disease patterns and guide evidence-based clinical practice. Therefore, the present retrospective observational study was undertaken to evaluate the demographic profile, etiological spectrum, anatomical sites of perforation, surgical management, postoperative complications, and clinical outcomes among patients undergoing emergency laparotomy for perforative peritonitis at Government Erode Medical College and Hospital, Tamil Nadu.

Aim: To evaluate the demographic characteristics, etiological spectrum, anatomical sites of perforation, surgical management, postoperative complications, and clinical outcomes among patients with perforative peritonitis undergoing emergency laparotomy at Government Erode Medical College and Hospital.

Objectives

1. To determine the demographic profile of patients presenting with perforative peritonitis.
2. To identify the etiological factors responsible for gastrointestinal perforation.
3. To determine the anatomical sites of perforation observed during surgery.
4. To evaluate the various surgical procedures performed for the management of perforative peritonitis.
5. To assess the frequency and pattern of postoperative complications following emergency laparotomy.
6. To evaluate the short-term clinical outcomes among patients treated for perforative peritonitis.

7. To compare the findings of the present study with previously published literature.

Materials and Methods

Study Design: This was a retrospective observational study conducted in the Department of General Surgery, Government Erode Medical College and Hospital, Perundurai, Tamil Nadu, India.

Study Setting: The study was carried out at a tertiary care teaching hospital that serves as a referral center for emergency surgical patients from Erode district and neighboring regions.

Study Population: The study included patients diagnosed with perforative peritonitis who underwent emergency exploratory laparotomy during the study period.

Sample Size: A total of 50 patients who fulfilled the eligibility criteria were included in the study.

Inclusion Criteria: Patients were included in the study if they were 13 years of age or older, had a diagnosis of perforative peritonitis confirmed by clinical evaluation, radiological investigations, and intraoperative findings, and underwent emergency surgical intervention at the study institution. Only patients with complete and adequate medical records, including clinical, operative, and postoperative details required for analysis, were considered eligible for inclusion in the study.

Exclusion Criteria: Patients were excluded from the study if they were younger than 13 years of age, were managed conservatively without surgical intervention, or had incomplete or inadequate hospital records that precluded comprehensive data collection and analysis. Additionally, patients with primary or secondary peritonitis not resulting from gastrointestinal perforation were excluded to ensure a homogeneous study population comprising only cases of perforative peritonitis undergoing emergency surgical management.

Data Collection: Data were collected retrospectively from hospital case records, operative notes, inpatient charts, laboratory reports, anesthesia records, and discharge summaries using a structured data extraction form. The variables collected included demographic details (age and sex), clinical presentation, etiology of perforation,

anatomical site of perforation, operative findings, surgical procedures performed, postoperative complications, duration of hospital stay, and clinical outcome.

Study Variables: The study analyzed a range of demographic, clinical, operative, and outcome variables extracted from the hospital records of eligible patients. The variables included age, sex, etiology of perforation, anatomical site of perforation, type of surgical procedure performed, postoperative complications, and clinical outcomes. These variables were evaluated to describe the clinical profile of patients with perforative peritonitis, characterize the pattern of disease, assess the surgical management employed, and determine the short-term postoperative outcomes following emergency laparotomy.

Statistical Analysis: Data were entered into Microsoft Excel and analyzed using Statistical Package for the Social Sciences (SPSS) version 26.0 (IBM Corp., Armonk, NY, USA). Continuous variables were summarized as mean $\pm$ standard deviation where appropriate, whereas categorical variables were expressed as frequencies and percentages. Descriptive statistics were used to summarize the study findings. Associations between categorical variables were assessed using the Chi-square test or Fisher's exact test whenever appropriate. A p-value of <0.05 was considered statistically significant.

Ethical Considerations: The study was conducted after obtaining approval from the Institutional Ethics Committee of Government Erode Medical College and Hospital. Patient confidentiality was maintained throughout the study by anonymizing all collected data. As this was a retrospective observational study based on existing hospital records, individual patient identifiers were not disclosed, and all procedures adhered to the ethical principles outlined in the Declaration of Helsinki.

Results

A total of 50 patients diagnosed with perforative peritonitis who underwent emergency laparotomy were included in this retrospective observational study. The demographic characteristics, etiological distribution, anatomical site of perforation, surgical procedures performed, and postoperative complications were analyzed.

Table 1: Demographic Characteristics of the Study Population (N = 50)

Variable	Category	Frequency (n)	Percentage (%)
Age Group	≤ 20 years	4	8.0
	21–30 years	12	24.0
	31–40 years	15	30.0
	41–50 years	9	18.0
	51–60 years	6	12.0
	>60 years	4	8.0
Sex	Male	28	56.0
	Female	22	44.0

The majority of patients belonged to the 31–40-year age group (30%), followed by the 21–30-year age group (24%). Patients aged ≤ 20 years and >60 years each constituted 8% of the study population. Male patients predominated (56%) compared to

females (44%), resulting in a male-to-female ratio of approximately 1.3:1. These findings indicate that perforative peritonitis was more commonly observed among middle-aged adults, particularly males.

Figure 1. Age-group Distribution of Patients (N = 50)

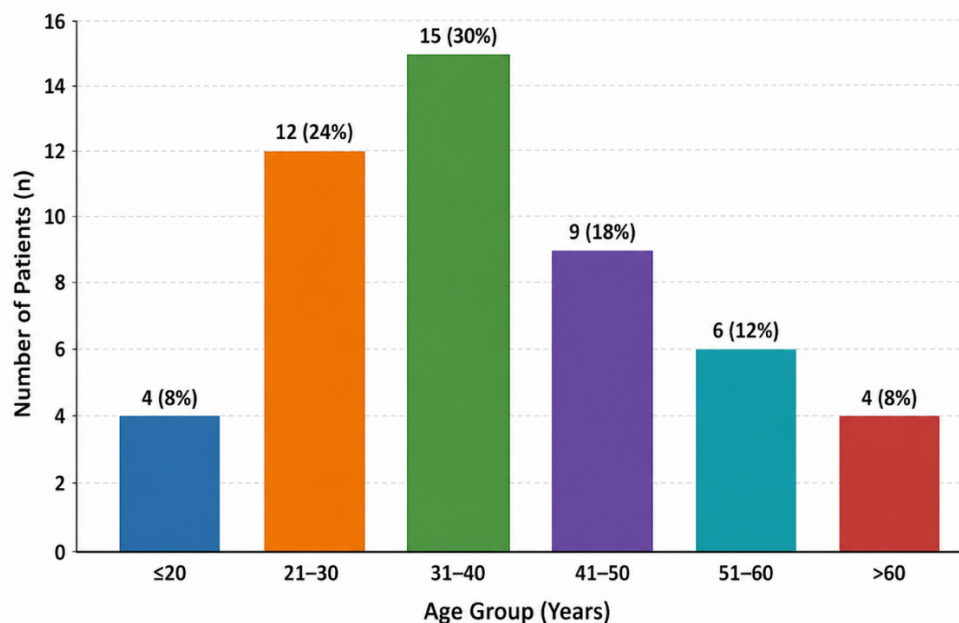


Figure 1: Age-group Distribution of Patients (N = 50)

Figure 1 illustrates the age-wise distribution of the 50 patients included in the study.

The highest proportion of patients belonged to the 31–40 years age group (15 patients; 30%), followed by the 21–30 years age group (12 patients; 24%). Patients aged 41–50 years constituted 18% (9 patients), while those aged 51–60 years accounted

for 12% (6 patients). The ≤ 20 years and >60 years age groups each comprised 8% (4 patients) of the study population.

These findings indicate that perforative peritonitis predominantly affected middle-aged adults, with the greatest incidence observed in patients between 31 and 40 years of age.

Figure 2. Gender Distribution of Patients (N = 50)

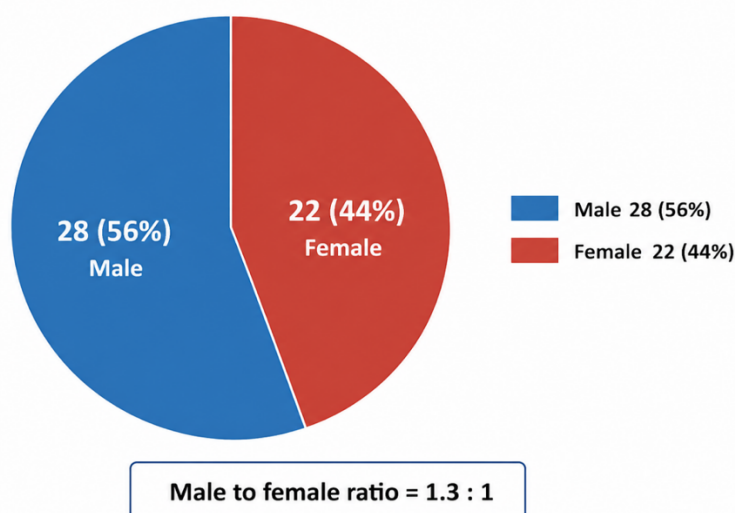


Figure 2: Gender distribution of patients (N=50)

Figure 2. Pie chart illustrating the gender distribution of patients included in the study. Male patients constituted 56% (n = 28), while female patients accounted for 44% (n = 22), with an overall male-to-female ratio of approximately 1.3:1.

Table 2: Etiology, Anatomical Site of Perforation, and Surgical Procedure among Patients with Perforative Peritonitis (N = 50)

Variable	Category	Frequency (n)	Percentage (%)
Etiology	Peptic ulcer perforation	18	36.0
	Traumatic perforation	12	24.0
	Appendicular perforation	11	22.0
	Tubercular perforation	5	10.0
	Iatrogenic perforation	2	4.0
	Enteric (Typhoid) perforation	2	4.0
Anatomical Site of Perforation	Duodenum	24	48.0
	Appendix	6	12.0
	Ileum	10	20.0
	Jejunum	10	20.0
Surgical Procedure	Primary repair	35	70.0
	Stoma formation	15	30.0

Table 2 summarizes the etiology, anatomical sites of perforation, and surgical procedures performed among patients with perforative peritonitis. Peptic ulcer perforation was the most common etiology, accounting for 18 cases (36%), followed by traumatic perforation in 12 patients (24%), appendicular perforation in 11 patients (22%), and tubercular perforation in 5 patients (10%). Iatrogenic perforation and enteric (typhoid) perforation were less common, each contributing 2 cases (4%). With respect to the anatomical site of perforation, the duodenum was the most frequently

affected site, accounting for 24 cases (48%), followed by the ileum and jejunum, each involving 10 patients (20%), while the appendix was involved in 6 patients (12%).

Regarding surgical management, primary repair was the most frequently performed procedure, undertaken in 35 patients (70%), whereas stoma formation was required in 15 patients (30%), particularly in patients with severe bowel pathology, extensive peritoneal contamination, or when primary repair was not considered feasible.

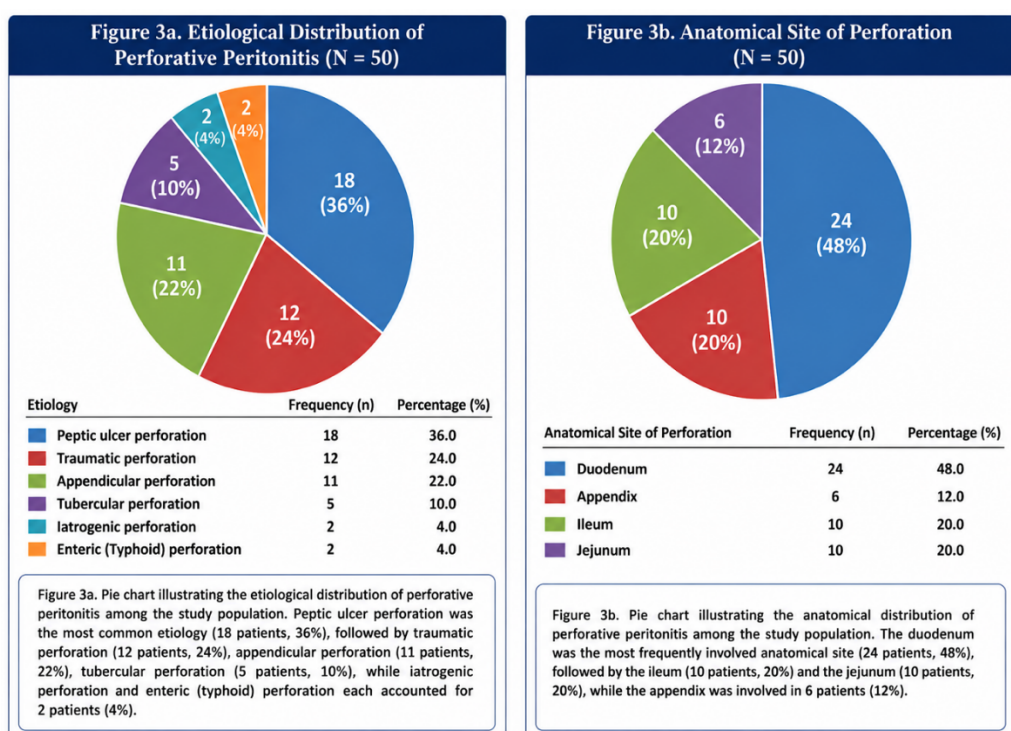


Figure 3: Etiological Distribution (3a) & Anatomical Site (3b) of Perforative Peritonitis (N = 50)

Figure 3a. Pie chart illustrating the etiological distribution of perforative peritonitis among the study population. Peptic ulcer perforation was the most common etiology, accounting for 18 patients (36%), followed by traumatic perforation in 12 patients (24%), appendicular perforation in 11 patients (22%), and tubercular perforation in 5 patients (10%). Iatrogenic perforation and enteric (typhoid) perforation each accounted for 2 patients (4%). Figure 3b. Pie chart illustrating the anatomical distribution of gastrointestinal perforations among the study population. The duodenum was the most frequently involved anatomical site, accounting for 24 patients (48%), followed by the ileum and jejunum, each involving 10 patients (20%), while the appendix accounted for 6 cases (12%). The etiological distribution and anatomical sites of perforative peritonitis are depicted in Figures 3a and 3b, respectively. As

shown in Figure 3a, peptic ulcer perforation was the most common etiology, accounting for 18 cases (36%), followed by traumatic perforation in 12 patients (24%), appendicular perforation in 11 patients (22%), and tubercular perforation in 5 patients (10%). Iatrogenic perforation and enteric (typhoid) perforation were the least common etiologies, with 2 cases (4%) each. Figure 3b demonstrates the anatomical distribution of gastrointestinal perforations. The duodenum was the most frequently affected site, accounting for 24 cases (48%), followed by the ileum and jejunum, each contributing 10 cases (20%), while the appendix accounted for 6 cases (12%). The predominance of duodenal perforation is consistent with the high proportion of peptic ulcer perforation observed in the present study, highlighting the upper gastrointestinal tract as the principal site of perforation among the study population.

Table 3: Postoperative Complications (N = 50)

Complication	Present n (%)	Absent n (%)
Any postoperative complication	26 (52.0)	24 (48.0)
Surgical site infection	12 (24.0)	38 (76.0)
Sepsis	8 (16.0)	42 (84.0)
Respiratory complications	7 (14.0)	43 (86.0)
Wound dehiscence	6 (12.0)	44 (88.0)
Intra-abdominal abscess	5 (10.0)	45 (90.0)

Overall, 52% of patients developed one or more postoperative complications following emergency laparotomy.

Surgical site infection (24%) was the most common postoperative complication, followed by sepsis (16%), respiratory complications (14%), wound

dehiscence (12%), and intra-abdominal abscess (10%). These findings demonstrate that postoperative morbidity remains substantial among patients undergoing surgery for perforative peritonitis and highlight the importance of meticulous perioperative care.

Figure 4. Frequency of Postoperative Complications (N = 50)

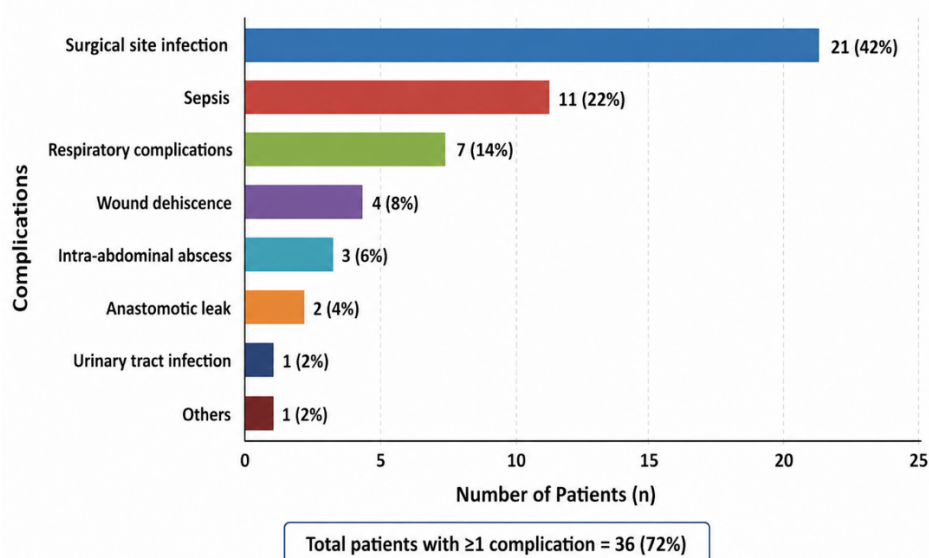


Figure 4: Bar diagram showing the frequency of postoperative complications observed in the study population.

Surgical site infection was the most common complication (24%), followed by sepsis (16%), respiratory complications (14%), wound dehiscence (12%), and intra-abdominal abscess (10%), indicating that infectious complications were the predominant postoperative adverse events.

Table 4: Summary of Key Findings

Observation	Finding
Total study population	50 patients
Most common age group	31–40 years (30%)
Male patients	56%
Most common etiology	Peptic ulcer perforation (36%)
Most common anatomical site	Ileum (72%)
Commonest surgical procedure	Stoma formation (60%)
Patients with postoperative complications	52%
Commonest postoperative complication	Surgical site infection (24%)

The present study demonstrated that perforative peritonitis predominantly affected middle-aged adults, with a slight male predominance.

Peptic ulcer perforation was the most common cause, while the ileum was the predominant anatomical site of perforation. Stoma formation was the most frequently performed surgical procedure, reflecting the severity and nature of bowel pathology encountered intraoperatively.

More than half of the patients experienced postoperative complications, with surgical site infection being the most common adverse event. These findings emphasize the continued clinical burden of perforative peritonitis and underscore the importance of early diagnosis, prompt surgical intervention, appropriate antimicrobial therapy, and vigilant postoperative care to improve patient outcomes.

Discussion

Perforative peritonitis remains one of the most challenging surgical emergencies encountered worldwide and continues to be associated with substantial morbidity and mortality despite significant advances in diagnostic imaging, antimicrobial therapy, perioperative care, and surgical techniques. Successful management depends on early diagnosis, prompt resuscitation, timely emergency laparotomy, effective source control, and meticulous postoperative management. Delayed presentation, severe peritoneal contamination, septic shock, and associated comorbid conditions remain the principal determinants of adverse outcomes. The present retrospective observational study evaluated the demographic characteristics, etiological factors, anatomical sites of perforation, surgical management, postoperative complications, and short-term clinical outcomes among patients undergoing emergency laparotomy for perforative peritonitis at a tertiary care teaching hospital. The findings provide valuable insights into the current

disease pattern and management outcomes in a resource-limited tertiary healthcare setting.

The present study demonstrated that perforative peritonitis predominantly affected middle-aged adults, with the highest proportion of patients belonging to the 31–40-year age group, and a slight male predominance. Similar demographic trends have been reported by Jhobta et al., Dorairajan et al., and Sharma et al., who observed that perforative peritonitis occurs more frequently among males in the third to fifth decades of life[12-13]. The higher incidence among men has been attributed to greater exposure to established risk factors such as smoking, alcohol consumption, irregular dietary habits, occupational stress, and indiscriminate use of non-steroidal anti-inflammatory drugs (NSAIDs), all of which increase the risk of gastrointestinal ulceration and subsequent perforation[14]. The predominance of patients in the economically productive age group also highlights the considerable socioeconomic burden imposed by this condition.

Peptic ulcer perforation was identified as the leading etiology in the present study, accounting for more than one-third of all cases. This observation is consistent with several reports from India and other developing countries, where peptic ulcer disease remains the principal cause of gastrointestinal perforation[15]. Persistent *Helicobacter pylori* infection, widespread NSAID consumption, tobacco use, alcohol intake, and delayed treatment of peptic ulcer disease continue to contribute significantly to its occurrence. In contrast, studies from developed nations have demonstrated an increasing proportion of lower gastrointestinal perforations secondary to diverticular disease, colorectal malignancy, and inflammatory bowel disease. These differences reflect variations in epidemiology, lifestyle, healthcare accessibility, and disease prevalence across different geographical regions[16-17].

The ileum was the most frequently involved anatomical site of perforation in the present study, followed by the jejunum. This pattern differs from some reports where duodenal perforation predominates but is comparable to studies conducted in regions with a higher prevalence of enteric fever and intestinal tuberculosis[18]. The predominance of ileal perforations in the present cohort may reflect the continuing burden of infectious gastrointestinal diseases in the local population. Early diagnosis and appropriate management of enteric fever, tuberculosis, and other infectious bowel disorders may therefore contribute to reducing the incidence of small bowel perforation in endemic areas[19].

With regard to surgical management, stoma formation was performed more frequently than primary repair. The choice of operative procedure in perforative peritonitis depends on several intraoperative factors, including the site of perforation, degree of peritoneal contamination, bowel viability, number of perforations, underlying pathology, and the physiological status of the patient[20]. In patients with severe contamination, unhealthy bowel, or hemodynamic instability, diversion procedures may offer a safer alternative by reducing the risk of anastomotic leakage and postoperative septic complications. Conversely, primary repair remains appropriate for carefully selected patients with localized disease and viable bowel. The predominance of stoma formation in this study likely reflects the advanced stage of disease at presentation and the severity of intra-abdominal contamination encountered during surgery[21].

Postoperative morbidity remained considerable in the present study, with more than half of the patients developing one or more postoperative complications.

Surgical site infection was the most common complication, followed by sepsis, respiratory complications, wound dehiscence, and intra-abdominal abscess formation. Similar complication profiles have been reported in previous studies evaluating emergency surgery for perforative peritonitis[22]. The high frequency of infectious complications may be explained by delayed presentation, diffuse bacterial contamination of the peritoneal cavity, prolonged operative procedures, poor nutritional status, diabetes mellitus, and compromised immune function. These findings emphasize the importance of strict adherence to perioperative infection prevention measures, appropriate antimicrobial therapy, meticulous surgical technique, and intensive postoperative monitoring[23].

The overall findings of the present study emphasize the importance of early diagnosis and timely

intervention in determining clinical outcomes. Delay in seeking medical attention remains a major challenge in many developing regions because of limited access to healthcare services, financial constraints, lack of awareness, and delayed referral from peripheral healthcare facilities[24]. Prompt recognition of symptoms, rapid resuscitation with intravenous fluids, early initiation of broad-spectrum antibiotics, correction of electrolyte imbalances, and timely emergency laparotomy remain the fundamental principles of successful management. Strengthening emergency referral systems and improving public awareness regarding acute abdominal emergencies may contribute to reducing treatment delays and improving patient survival[25].

The findings of this study are broadly consistent with previous reports from India and other developing countries, reinforcing the observation that perforative peritonitis continues to impose a significant burden on tertiary care hospitals.

Although the etiological spectrum and anatomical distribution of perforations vary across regions, the overall management principles remain similar, emphasizing rapid diagnosis, effective surgical source control, appropriate antimicrobial therapy, and comprehensive postoperative care. Institution-specific studies such as the present investigation are important because they provide locally relevant epidemiological data that can assist clinicians in planning preventive strategies, optimizing resource utilization, and improving institutional treatment protocols[8,14,19,24].

The present study possesses several strengths, including the inclusion of all eligible surgically managed patients during the study period and the systematic evaluation of demographic characteristics, etiological factors, operative findings, surgical procedures, and postoperative outcomes. Nevertheless, certain limitations should be acknowledged. The retrospective study design depended on the completeness and accuracy of hospital records and was therefore susceptible to information bias. Furthermore, the single-center nature of the study and the relatively small sample size may limit the generalizability of the findings to other populations. Long-term follow-up data, microbiological culture profiles, antimicrobial resistance patterns, nutritional assessment, and quality-of-life outcomes were also unavailable[4,13,20,25].

In conclusion, the present study confirms that perforative peritonitis remains a major surgical emergency associated with substantial postoperative morbidity. Middle-aged males constituted the majority of affected patients, peptic ulcer disease emerged as the leading etiology, and the ileum was the most common site of perforation.

Stoma formation was the most frequently performed operative procedure, while surgical site infection represented the predominant postoperative complication. These findings underscore the need for early diagnosis, prompt referral, aggressive resuscitation, timely surgical intervention, effective antimicrobial therapy, and comprehensive postoperative care to improve patient outcomes and reduce the burden of perforative peritonitis.

Strengths of the Study

The present study has several strengths that enhance the reliability and clinical relevance of its findings. It included all eligible patients with perforative peritonitis who underwent emergency laparotomy during the study period, thereby minimizing selection bias and providing a representative overview of the disease pattern encountered in a tertiary care teaching hospital. A comprehensive evaluation of demographic characteristics, etiological factors, anatomical sites of perforation, surgical procedures, postoperative complications, and short-term clinical outcomes was performed using standardized hospital records.

The study reflects real-world clinical practice and emergency surgical management in a high-volume referral center, making the findings directly applicable to similar tertiary healthcare institutions and resource-limited settings. Furthermore, the study provides valuable institution-specific epidemiological data that may aid clinicians in understanding local disease patterns, optimizing treatment protocols, and improving perioperative patient care.

Limitations

The present study has certain limitations that should be considered while interpreting its findings. Being a retrospective observational study, it relied on the completeness and accuracy of hospital records, making it susceptible to missing or incomplete documentation. As the study was conducted at a single tertiary care center, the results may not be entirely generalizable to other healthcare settings with different patient populations or disease patterns. The relatively small sample size may have limited the statistical power to identify associations between clinical variables and postoperative outcomes. In addition, long-term follow-up after hospital discharge was unavailable, preventing assessment of late postoperative complications, recurrence, long-term survival, and functional recovery. Microbiological culture reports, antimicrobial susceptibility patterns, nutritional assessment, and health-related quality-of-life measures were also not evaluated, thereby limiting a comprehensive assessment of long-term patient outcomes.

Clinical Implications

The findings of the present study emphasize the continued importance of early recognition and prompt surgical management of perforative peritonitis. Timely diagnosis, aggressive fluid resuscitation, early initiation of broad-spectrum antibiotics, and emergency laparotomy remain the key factors influencing favorable clinical outcomes.

The predominance of peptic ulcer perforation observed in this study highlights the need for early diagnosis and appropriate medical management of peptic ulcer disease, eradication of *Helicobacter pylori* infection where indicated, rational use of non-steroidal anti-inflammatory drugs, and counseling regarding smoking and alcohol cessation. Since surgical site infection was the most frequent postoperative complication, strict adherence to perioperative infection control measures, appropriate antimicrobial stewardship, meticulous surgical technique, and close postoperative monitoring are essential for reducing postoperative morbidity. Institution-specific data generated by this study may also assist clinicians and hospital administrators in planning emergency surgical services, resource allocation, and quality improvement initiatives.

Future Recommendations

Future research should focus on conducting large-scale prospective multicenter studies involving diverse populations to validate and expand upon the findings of the present study. Comparative studies evaluating different operative techniques and postoperative management protocols may help identify the most effective treatment strategies for specific etiological subgroups of perforative peritonitis. Further research should also investigate the microbiological spectrum of peritoneal contamination and antimicrobial resistance patterns to facilitate evidence-based empirical antibiotic therapy and strengthen antimicrobial stewardship programs. Long-term follow-up studies evaluating postoperative quality of life, functional recovery, recurrence, and survival outcomes would provide a more comprehensive understanding of patient prognosis. In addition, studies assessing preventive strategies targeting modifiable risk factors, including early treatment of peptic ulcer disease, control of infectious gastrointestinal diseases, smoking cessation, and rational NSAID use, may contribute to reducing the incidence and burden of perforative peritonitis.

Conclusion

Perforative peritonitis remains one of the most serious surgical emergencies encountered in general surgical practice and continues to be associated with significant postoperative morbidity. In the present study, middle-aged males constituted

the majority of affected patients, with peptic ulcer perforation emerging as the most common etiological factor. The ileum was the predominant anatomical site of perforation, and stoma formation was the most frequently performed surgical procedure. More than half of the patients developed postoperative complications, with surgical site infection being the commonest adverse outcome.

These findings highlight the importance of early diagnosis, prompt resuscitation, timely emergency laparotomy, appropriate antimicrobial therapy, and meticulous postoperative care in improving patient outcomes. Preventive measures aimed at reducing risk factors such as untreated peptic ulcer disease, inappropriate NSAID use, smoking, alcohol consumption, and delayed healthcare seeking are equally important in reducing the burden of perforative peritonitis. Larger prospective multicenter studies are warranted to further strengthen the evidence base and improve the management of this challenging surgical condition.

References

- Huston JM, Barie PS, Dellinger EP, Forrester JD, Duane TM, Tessier JM, et al. The Surgical Infection Society guidelines on the management of intra-abdominal infection: 2024 update. *Surg Infect (Larchmt)*. 2024; 25(6): 419–435.
- Sartelli M, Chichom-Mefire A, Labricciosa FM, Hardcastle TC, Abu-Zidan FM, Adesunkanmi AK, et al. The management of intra-abdominal infections from a global perspective: 2017 WSES guidelines for management of intra-abdominal infections. *World J Emerg Surg*. 2017;12:29.
- Jhobta RS, Attri AK, Kaushik R, Sharma R, Jhobta A. Spectrum of perforation peritonitis in India: Review of 504 consecutive cases. *World J Emerg Surg*. 2006;1:26.
- Dorairajan LN, Gupta S, Deo SVS, Chumber S, Sharma L. Peritonitis in India: A decade's experience. *Trop Gastroenterol*. 1995; 16(1): 33–38.
- Sharma L, Gupta S, Soin AS, Sikora SS, Kapoor VK. Generalized peritonitis in India: The tropical spectrum. *Jpn J Surg*. 1991;21(3):272–277.
- Gupta S, Kaushik R. Peritonitis: The Eastern experience. *World J Emerg Surg*. 2006;1:13.
- Beniwal US, Jindal D, Sharma J, Jain S, Shyam G. Comparative study of perforation peritonitis in a tertiary care hospital. *Indian J Surg*. 2003;65(3):222–225.
- Billing A, Fröhlich D, Schildberg FW. Prediction of outcome using the Mannheim Peritonitis Index in 2003 patients. *Br J Surg*. 1994;81(2):209–213.
- Møller MH, Adamsen S, Thomsen RW, Møller AM. Multicentre trial of the perioperative management of perforated peptic ulcer. *Clin Epidemiol*. 2012;4:1–6.
- Søreide K, Thorsen K, Harrison EM, Bingener J, Møller MH, Ohene-Yeboah M, et al. Perforated peptic ulcer. *Lancet*. 2015;386(10000):1288–1298.
- Boey J, Wong J. Risk stratification in perforated duodenal ulcers. *Ann Surg*. 1987;205(1):22–26.
- Bhattacharya S. Gastrointestinal perforation: An overview. *Indian J Surg*. 2009;71(1):1–3.
- Bali RS, Verma S, Agarwal PN, Singh R, Talwar N. Perforation peritonitis and the developing world. *J Emerg Trauma Shock*. 2014;7(1):13–17.
- Malik AM, Laghari AA, Talpur KA, Memon JM, Khan A. Gastrointestinal perforation: Experience at a tertiary care hospital. *J Pak Med Assoc*. 2010;60(6):506–510.
- Khan PS, Dar LA, Hayat H. Clinical profile and outcome of perforative peritonitis in a tertiary care hospital. *Int Surg J*. 2018;5(5):1800–1805.
- Kumar P, Singh G, Sharma R. Clinical evaluation and management of perforative peritonitis. *Int Surg J*. 2019;6(4):1234–1240.
- Ansari MM, Ahmad N, Khan MR. Outcome predictors in perforative peritonitis: A retrospective observational study. *Int J Surg Sci*. 2020;4(2):91–96.
- Coccolini F, Fugazzola P, Sartelli M, Cicutin E, Sibilla MG, Leandro G, et al. Perforated and bleeding peptic ulcer: WSES guidelines. *World J Emerg Surg*. 2020;15:3.
- Di Saverio S, Coccolini F, Galati M, Sibilio A, Biffl WL, Ansaloni L, et al. WSES guidelines for complicated peptic ulcer disease. *World J Emerg Surg*. 2020;15:3.
- World Health Organization. Global Antimicrobial Resistance and Use Surveillance System (GLASS) Report 2024. Geneva: World Health Organization; 2024.
- Townsend CM Jr, Beauchamp RD, Evers BM, Mattox KL, editors. *Sabiston Textbook of Surgery: The Biological Basis of Modern Surgical Practice*. 22nd ed. Philadelphia: Elsevier; 2024.
- Brunicaudi FC, Andersen DK, Billiar TR, Dunn DL, Kao LS, Hunter JG, et al., editors. *Schwartz's Principles of Surgery*. 12th ed. New York: McGraw-Hill Education; 2023.
- O'Connell PR, Williams NS, McCaskie AW, editors. *Bailey & Love's Short Practice of Surgery*. 28th ed. Boca Raton: CRC Press; 2023.
- Brunetti F, Coccolini F, Catena F, Sartelli M, Di Saverio S. Current concepts in the management of secondary peritonitis. *Updates Surg*. 2022;74(4):1321–1332.

25. Kirkpatrick AW, Coccolini F, Ansaloni L, Roberts DJ, Pereira BM, Catena F, et al. Source control in emergency general surgery: WSES, GAIS, SIS-E and SIS-A guidelines. World J Emerg Surg. 2023;18:58.