

SPECTRUM OF PERFORATIVE PERITONITIS-A PROSPECTIVE OBSERVATIONAL STUDY

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ABSTRACT

Objectives: Peritonitis secondary to gastrointestinal perforation is a common surgical emergency that has significant mortality and morbidity rates. The aim was to study the etiologies of perforative peritonitis, treatment modalities, and treatment options.

Methods: This was a prospective observational study conducted between January and December 2020. Patients with perforative peritonitis either clinically or radiologically were included in the study after obtaining informed consent. Etiology of perforation, surgical procedures, complications, and outcomes was observed and collected in preformed pro forma. Data were collected in Microsoft Excel and analyzed.

Results: Out of 94 patients, 92 underwent emergency surgery. About 56.38%, (n=53/94) were in the age group of 31–60 years, 86.17%, n=81/94 were males, 79.78%, (n=75/94) presented late to the hospital, abdominal pain and tenderness were seen in all patients and pneumoperitoneum was seen in 58.51%, (n=55/94). The most common cause was peptic ulcer (46.80%, n=20/94) and the most common site of perforation was the first part of the duodenum (35.10%, n=33/94). About 84.04%, (n=79/94) of surgeries were uneventful while surgical site infection was the common complication (40%, n=6/15). About 80.85%, (n=76/94) of patients recovered uneventfully while 19.14% (n=18/94) expired.

Conclusion: Peptic ulcer being the common etiology indicates improper peptic ulcer management. Early presentation to the hospital and prompt resuscitation with surgical interventions can improve recovery and reduce mortality in perforative peritonitis.

Keywords: Peptic ulcer, Perforation, Peritonitis.

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INTRODUCTION

Peritonitis is inflammation due to the reaction of the peritoneal cavity to the contents of the perforated viscus. While primary peritonitis is spontaneous and does not need surgical intervention, secondary peritonitis arises from perforation and is therefore amenable to surgical therapy [1]. Perforation introduces irritants like gastric acid and bile into the peritoneal cavity and is associated with significant mortality and morbidity rates.

Diagnosis is made clinically and confirmed by the presence of pneumoperitoneum on radiographs. Non-operative management is successful in patients identified to have a spontaneously sealed perforation proved by water-soluble contrast gastroduodenogram [2]. Operative management consists of time honored practice of omental patch closure, but this can be done by the laparoscopic method. Laparoscopic approaches to closure of duodenal perforation are now being applied widely, especially in patients with perforations of size <10 mm presenting within the first 24 h of onset of pain [3].

Perforation of the ileum, vermiform appendix, and infarcted bowel are common causes of peritonitis and needs surgical intervention. The objective of operative protocol is to correct the underlying pathology, while avoiding any serious incidents and to adopt a surgical procedure with minimal complications [4]. The present study was aimed to determine the etiologies of hollow viscus perforation leading to peritonitis and to analyze the management modalities and disease outcomes in patients with perforative peritonitis.

METHODS

This was a prospective observational study conducted in patients admitted with features of perforative peritonitis at the Department of General Surgery, Government Villupuram Medical College and Hospital, Mundiyampakkam, Tamilnadu, India between January and December

2020. The study was approved by the Institutional Ethics Committee of Chengalpattu Medical College. All patients, of age more than 13 years, who presented with features of perforative peritonitis either clinically or radiologically and with positive peritoneal fluid culture were included in the study, after obtaining written informed consent from patient/patient's attenders. Patients with post-operative peritonitis, patients with esophageal perforation, and patients with peritonitis due to enterocutaneous fistula were excluded from the study.

Sociodemographic details of the patients were entered in the proforma. After blood and urine investigations (complete hemogram, blood grouping, renal function test, serum electrolytes, blood sugar, urine albumin, and deposits), chest X-ray and abdomen erect X-ray films were taken, followed by an ultrasound scan of the abdomen and pelvis. In doubtful cases, abdominal paracentesis was performed. When the patient was stabilized and anesthetic fitness obtained, an emergency laparotomy was performed under general anesthesia. Peritoneal cavity was explored serially in all quadrants. Every procedure was completed only after peritoneal lavage with 4–5 l of normal saline and a drain was left depending on the level of contamination. All investigation results, surgical details, complications, and outcomes were entered in the pro forma. All details were entered in Microsoft Excel and analyzed. Quantitative variables were expressed as mean and standard deviation, while categorical variables were given as frequencies and proportions.

RESULTS

In the present study to determine the etiologies of hollow viscus perforation with peritonitis, there were 94 patients who were admitted during the study period, out of which 92 patients underwent emergency laparotomy. Age of the patient was divided into three groups, namely <30 years, 31–60 years, and >60 years for analysis.

More than half of the patients in the present study were in the age group of 31–60 years (56.38%, n=53/94). Most of the patients were males (86.17%, n=81/94). Most of the patients in the present study presented after 48 hours of perforation at the hospital (79.78%, n=75/94). Trauma as the cause of perforation was seen in only 11.70% of patients (n=11/94). Abdominal pain was the most common symptom seen in all patients (100%, n=94/94), followed by abdominal distension (37.23%, n=35/94) and vomiting (21.28%, n=20/94). Tenderness was the most common sign elicited in the present study population (100%, n=94/94), followed by guarding (81.91%, n=77/94) and rigidity (75.53%, n=71/94).

Obliteration of liver dullness was elicited in 45.74% of patients (n=43/94), while pneumoperitoneum (as evidenced in X-ray of chest and abdomen erect view) was seen in 58.51%, (n=55/94). The most common etiology for perforative peritonitis was peptic ulcer (46.80%, n=44/94) followed by inflammatory pathology (typhoid, appendicitis, etc.), which was seen in 21.27% (n=20/94) (Fig. 1). During laparotomy procedure, the most common site for perforation was an anterior wall of the first part of the duodenum (35.10%, n=33/94) followed by perforation of the appendix (21.27%, n=20/94) (Fig. 2).

Most of the surgeries were uneventful (84.04%, n=79/94). The most common complication encountered was surgical site infection (40%, n=6/15) followed by bile leak (33.33%, n=5/15) (Fig. 3). While most of the patients recovered without complications (80.85%, n=76/94), 19.14% (n=18/94) of the patients expired in spite of management, the most common reason being septicemia.

DISCUSSION

The present study was designed to determine the etiologies of hollow viscous perforation leading to peritonitis, to analyze the management modalities and disease outcomes in these patients. There were 94 patients who were admitted during the study period, out of which 92 patients underwent emergency laparotomy while two patients were managed conservatively.

In the present study, 56.38% of the patients were in the age group of 31–60 years, while in the study by Patil *et al.* (30%) and Garg *et al.* (22.74%), many of the patients were in the age group 21–40 years [1,6]. Majority (86.17%) of the patients were males which was similar to the study by Patil *et al.* (84%), Garg *et al.*, and Kumar *et al.* (86.27%) [1,6,7].

The most common etiology for perforative peritonitis was peptic ulcer (46.80%) in the present study, which was similar to the results by Garg *et al.* (58.48%) and Thirumalagiri *et al.* (52.0%) [6,8].

Abdominal pain was the most common symptom followed by abdominal distension and vomiting in the present study. In the study by Garg *et al.* following abdominal pain and distension, constipation and fever were observed more (82.3% and 72.9%) [6]. Distension was found only in 37.2% of cases (35/94) in the present study. This was especially seen in appendicular perforation, where there is little spillage and peritonitis is localized.

Presence of air under the diaphragm is a hallmark of hollow viscous perforation, but its absence does not exclude the possibility of perforation. In the present study, it was found only in 58.5% of cases. The most common site for perforation was an anterior wall of the first part of the duodenum (35.10%). This was similar to the study by Patil *et al.* (46%) and Thirumalagiri *et al.* (52.0%) but in the study by Garg *et al.*, the most common site of perforation was stomach (72.22%) [1,6,8]. While the next common site of perforation was appendix in the present study, it was ileum in the study by Garg *et al.*, Thirumalagiri *et al.*, and Singla *et al.* [6,8,9].

When patients with perforative peritonitis were taken up for surgery, the decision for definitive surgery was reserved, based on the operative finding of the extent of peritoneal cavity contamination. Definitive surgery was not performed when gross contamination of the peritoneum was encountered. In the case of duodenal ulcer perforation

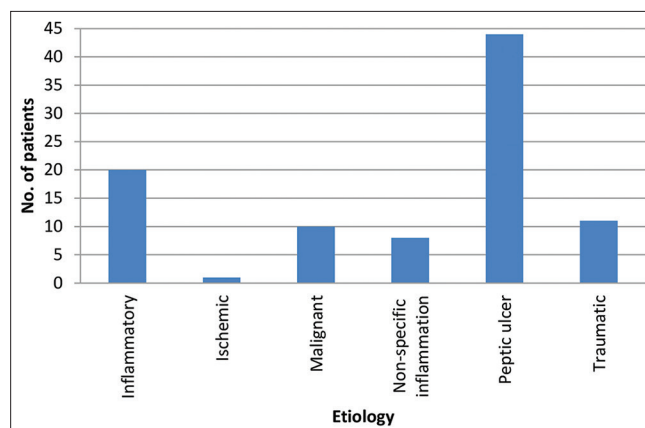


Fig. 1: Distribution of etiology of perforation in patients with peritonitis (n=94)

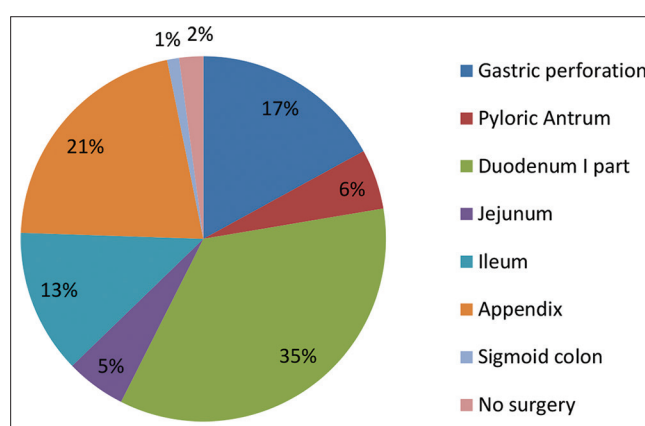


Fig. 2: Distribution of sites of perforation in patients with perforative peritonitis (n=94)

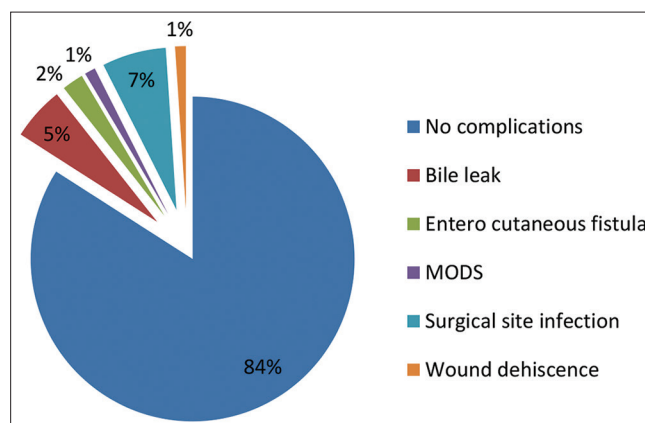


Fig. 3: Distribution of complications in patients with perforative peritonitis (n=94)

and gastric perforation, simple closure with Graham live omental patch was performed. Perforation of the appendix was managed by appendectomy in all cases. Primary closure of perforation was the treatment of choice when ileal perforations were small while in large perforations, resection, and anastomosis were usually performed.

Surgical site infection was the most common complication encountered in the present study, which was similar to the results by Patil *et al.* (20%) and Garg *et al.* (52.45%), while lower respiratory infection was the commonest complication in the study by Thirumalagiri *et al.* (12%) [1,8].

In the present study, 79.78% of patients presented late (>48 h after perforation) to the hospital. In the study by Kumar *et al.*, 65.36% (n=100/153) had presented after 24 h and they had concluded that late presentation was an adverse factor for survival. Complications were seen more when patients presented late to the hospital, and had poor nutrition with anemia and hypoproteinemia or dehydration with hypotension. As this study was done in a rural tertiary hospital, many poor patients utilize this facility but present late for treatment.

About 19.14% of patients expired in the present study, in spite of management. The overall mortality was 15.87% (20/126) in the study by Patil *et al.*, 12.63% (35/277) in the study by Garg *et al.*, 8% (4/50) in the study by Thirumalagiri *et al.*, and 5% (5/100) in the study by Singla *et al.* [1,6,8,9]. Mortality was common in elderly patients, patients who presented late to the hospital, and patients who presented with hypotension.

CONCLUSION

Peritonitis due to duodenal ulcer perforation was commonly observed in the present study population. This indicates improper treatment of peptic ulcer disease, as proton pump inhibitors have virtually eliminated ulcer perforation and its complications. Early presentation to the hospital and prompt resuscitation with surgical interventions can improve recovery and reduce mortality in perforative peritonitis. Comprehensive peritoneal lavage can reduce the incidence of post-operative infections and morbidity.

ETHICAL APPROVAL

Obtained from Institutional Ethics Committee of Chengalpattu Medical College, Chengalpattu, Tamil Nadu, India.

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SL analyzed data and approved the study. AM analyzed data and critically analyzed manuscript. PK analyzed and interpreted data. KK conceptualized, designed study, and prepared the manuscript.

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CONFLICT OF INTEREST

None declared.

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