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Clinical Profile and Outcome of Surgical Treatment of Perforated Peptic Ulcers in Bangladesh: A Tertiary Hospital Experience

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Abstract **Original Research Article**

Introduction: Peptic ulcer disease occurs when open sores, or ulcers, form in the stomach or first part of the small intestine. Many cases of peptic ulcer disease develop because a bacterial infection eats away at the protective lining of the digestive system. People who frequently take pain relievers are more likely to develop ulcers. ***Aim of the study:*** *The study aimed to evaluate* the Clinical Profile and Outcome of Surgical Treatment of Perforated Peptic Ulcers in Bangladesh. ***Methods:*** This was a combined retrospective and prospective study of patients operated on for peptic ulcer perforations at Khulna Medical College Hospital Khulna, Bangladesh, from January 2021 to December 2021. The subjects of this study included all patients who were operated on for peptic ulcers at Khulna Medical College Hospital Khulna during the period under study. ***Result:*** A total of 145 patients were enrolled and analyzed. Figure-1 shows the age distribution of the study; 65(44.83%) patients were under-aged <65, 55(37.93%) patients were from the age range 65-80, and 25(17.24%) patients were under-aged >80. The gender distribution of the study is shown in figure-2. Most of them had abdominal-related problems, whereas 91(62.76%) patients were male and 54(37.24%) were female. The clinical outcomes, there is half of the patients had a blood transfusion, 14(9.66%) patients had re-bleeding, 9(6.21%) patients had surgery problems, and only 7(4.83%) patients had a 30-day mortality rate. Patients needed to stay in the hospital for around 0-45 days, where the median hospital stay is six days. ***Conclusion:*** Perforation of peptic ulcers remains a frequent clinical problem in our environment, predominantly affecting young males not known to suffer from PUD. Simple closure with an omental patch followed by Helicobacter pylori eradication was effective with excellent results in the majority of survivors despite patients' late presentation in our centre.

Keywords: Clinical Profile, Outcome, Surgical Treatment, Perforated Peptic Ulcers.

INTRODUCTION

Peptic ulcer disease (PUD) is the ulceration in the gastrointestinal tract caused by acidity that results in mucosal corrosion, extreme pain, and discomfort. The corrosion must be ≥0.5 cm and occurs due to an imbalance between the stomach and duodenum digestive stashing. Acidity, racy food and stress are not the only causes of peulcersulcer as utmost ulcers are due to Helicobacter pylori infection [1]. The stomach and duodenum contain a mucosal filling that protects them from digestive concealment. Peptic ulcers can be distributed as gastric or duodenal ulcers (more common). Another type of PUD has been described as videlicet idiopathic PUD, an ulcer without definite causes. E.g. Helicobactor pylori infection, family history, NSAIDS abuse, hyperactive- gastrinemiaetc [2]. The threat factors or etiological factors of PUD may be Helicobacter pylori infection, stress, family history, racy diet, age, gender, smoking, alcohol consumption or excrescences resulting in a redundant acid product. The common symptoms of PUD include nausea, puking, heartburn, and burning pain in the stomach, while in severe cases puking of blood, black coprolite or severe

pain in the stomach can be observed [1]. Peptic ulcer complaint, though prevalence has recently dropped with the arrival of anti-bacterial remedies and proton pump impediments, is still a common health problem worldwide [3]. About 4 million people are affected in the world every time with peptic ulcers [4]. In India, it is more current in the southern part, and about 10- 20 cases encounter complications, of which 2- 14 cases are reported with perforations [5]. The common point of perforation is the prepyloric, pyloric and duodenal region [6]. Despite recent advances in the opinion and operation of peptic ulcers, the perforation rate is still adding. It has become one of the significant health challenges, especially in young individuals. [1] *The study aimed to evaluate* the Clinical Profile and Outcome of Surgical Treatment of Perforated Peptic Ulcers in Bangladesh.

METHODOLOGY & MATERIALS

This was a combined retrospective and prospective study of patients operated on for peptic ulcer perforations at Khulna Medical College Hospital Khulna, Bangladesh, from January 2021 to December 2021. The subjects of this study included all patients who were operated on for peptic ulcers at Khulna Medical College Hospital Khulna during the period under study. Patients with incomplete data were excluded from the study. Patients treated conservatively and those who failed to consent for H.I.V. infection were also excluded from the study. The data were collected using a performed questionnaire; variables included in the questionnaire were; the patient's demographic data (age, sex), associated medical premorbid illness, duration of illness, symptoms and history of ulcer or liver disease, endoscopic diagnosis, endoscopic intervention, medical treatment, surgical therapy the timing of surgical treatment, site of perforation, size of perforation, type of surgical procedure, postoperative complication, length of hospital stay. The duration of symptoms was defined as the period between the initial pain perception due to perforation and the operation. The statistical analysis was performed using the statistical package for social sciences (SPSS) version 20.0 for Windows (SPSS, Chicago, IL, U.S.A.). The mean ± standard deviation (S.D.), median and ranges were calculated for continuous variables, using proportions and frequency tables to summarize categorical variables. Continuous variables were categorized. Chi-square (c2) tests were used to test for the significance of association between the independent (predictor) and dependent (outcome) variables in the categorical variables. The level of importance was considered as $P < 0.05$. Multivariate logistic regression analysis was used to determine predictor variables that predict the outcomes.

RESULT

This is a retrospective study; a total of 145 patients were enrolled and analyzed. Figure-1 shows the age distribution of the study; 65(44.83%) patients were under-aged <65, 55(37.93%) patients were from the age range 65-80, and 25(17.24%) patients were under-aged >80. The gender distribution of the study is shown in figure-2. Most of them had abdominal-related problems, whereas 91(62.76%) patients were male and 54(37.24%) were female. From the study, we found 142(97.93%) patients with severe abdominal pain, 128(88.28%) patients with abdominal tenderness, 110(75.86%) patients with abdominal distention, etc (Table-1). Table-2 shows the postoperative complication of the study; 70 (48.28%) patients had surgical site infection, 52(35.86%) patients had postoperative pyrexia, and 40(27.59%) patients had pulmonary disease, etc. these are the major postoperative complications. From the endoscopic findings, we found more than 50% of patients had gastric ulcers and a high-risk ulcer (Forrest Ia-LLb), almost 50% of patients had low-risk ulcers (Forrest IIC-III) and 65(44.83%) patients had duodenal ulcers (Table-3). In this study, there were 127(87.59%) patients who had ulcers sized <2cm, 60(41.38%) patients had helicobacter pylori, 18(12.44%) patients had ulcers more significant than 2cm, and 14(9.44%) patients had shock (Table-3). Table-4 shows the required treatments and therapies; 85(58.62%) patients needed endoscopic therapy, and 75(51.72%) patients required initial hemostasis; types of initial hemostasis of the study population are also shown in table-4. According to the clinical outcomes, there is half of the patients had a blood transfusion, 14(9.66%) patients had re-bleeding, 9(6.21%) patients had surgery problems, and only 7(4.83%) patients had a 30-day mortality rate. Patients needed to stay in the hospital for around 0-45 days, where the median hospital stay is six days (Table-5).

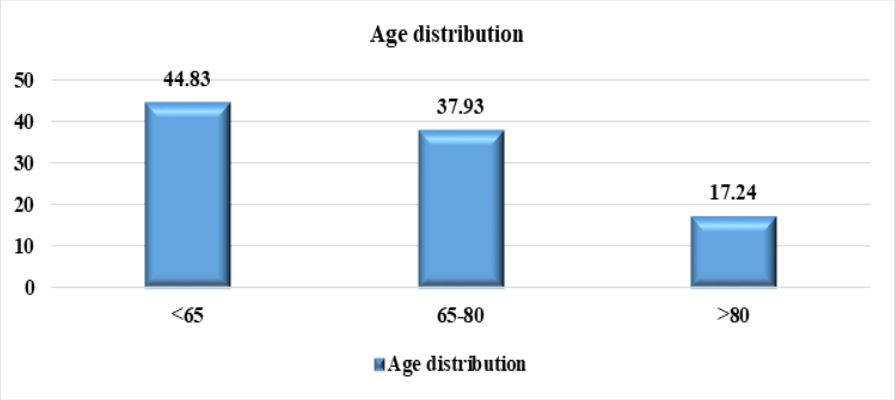

Figure-1: Age distribution of the study population (N=145)

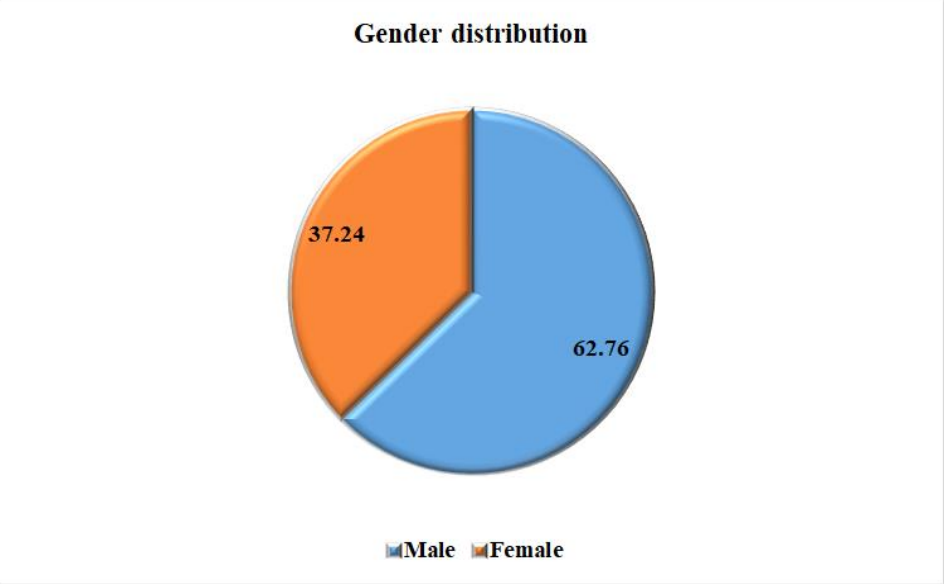

Figure-2: Gender distribution of the study population (N=145)

Table-1: Clinical presentation of the study (N=145)

Sing & Symptoms	Frequency	Percentage
Severe abdominal pain	142	97.93
Abdominal distention	110	75.86
Vomiting	54	37.24
Nausea	52	35.86
Severe dyspepsia	48	33.10
Constipation	43	29.66
Fever	31	21.38
Shock	48	33.10
Abdominal tenderness	128	88.28
Classical signs of peritonitis	97	66.90

Table-2: Postoperative complications of the study population (N=145)

Complications	Frequency	Percentage
Surgical site infections	70	48.28
Post-operative pyrexia	52	35.86
Pulmonary infection	40	27.59
Intra-abdominal abscess	29	20.00
Wound dehiscence/burst abdomen	29	20.00
Re-perforation	23	15.86
Septic shock	17	11.72

Complications	Frequency	Percentage
Enterocutaneous fistula	17	11.72
Peritonitis	17	11.72
Incisional hernia	12	8.28
Cardiopulmonary arrest	12	8.28
Acute renal failure	6	4.14
Paralytic ileus	6	4.14

Table-3: Clinical characteristics of the study population (N=145)

Characteristics	Frequency	Percentage
Endoscopic findings		
Gastric ulcers	80	55.17
Duodenal ulcers	65	44.83
High-risk ulcers (Forrest Ia-IIb)	75	51.72
Low-risk ulcers (Forrest IIc-III)	70	48.28
Ulcer size		
<2cm	127	87.59
≥2cm	18	12.41
Shock	14	9.66
Helicobacter pylori	60	41.38
Comorbidity (ASA class)		
ASA I	20	13.79
ASA II	41	28.28
ASA III-IV	84	57.93
Medication		
NSAIDs	41	28.28
Acetylsalicylic acid	29	20.00
Antiaggregation therapy	4	2.76
Anticoagulant therapy	8	5.52
Proton pump inhibitors or H2 blockers	13	8.97

Table-4: Treatments and therapies

Variables	Frequency	Percentage
Treatment		
Endoscopic therapy	85	58.62
Initial hemostasis	75	51.72
Types of initial hemostasis		
Epinephrine	58	40.00
Endoclips	29	20.00
Epinephrine + endoclips	50	34.48
Heater probe	6	4.14
Heater probe + epinephrine	2	1.38

Table-5: Clinical outcomes of the study population (N=145)

Outcome	Frequency	Percentage
Re-bleeding	14	9.66
30-day mortality	7	4.83
Blood transfusion	72	49.66
Surgery	9	6.21
Median hospital stay (days, range)	6, (0-45)	

DISCUSSION

In this study, 145 patients were enrolled over one year, giving an average of …. cases annually. This figure is similar to what was reported by Schein et al. Many et al. in South Africa reported a low incidence of perforated PUD [7, 8]. It is also possible that some clinicians managing the patients may not have considered perforation as a possible diagnosis. More than 90% of our patients had a classical presentation with sudden onset of sharp epigastric pain, as most of the studied patients were young aged in contradistinction to elderly patients in whom silent perforations usually occur [9, 10]. As reported in other studies, associated premorbid illness was documented

in 7.1% of cases [11-13]. Associated premorbid illnesses have been reported to influence the outcome of patients with perforated peptic ulcers [11]. In the present study, associated premorbid illness predicted the outcome of patients with perforated peptic ulcers. In the case of a perforated PUD ulcer, free intraperitoneal gas is less likely to be seen if the interval between the perforation and radiological examination is short [14]. Recently, Computerized tomography (CT) scans with oral contrast are now considered the reliable method of detecting small pneumoperitoneum before surgery and the gold standard for diagnosing perforation [15, 16]. Abdominal ultrasonography has also been superior to plain radiographs in the diagnosis of free intraperitoneal air [16]. None of these imaging studies was used to diagnose free intraperitoneal air in our study. We relied on plain radiographs of the abdominal/chest to establish the diagnosis of free intraperitoneal air, which was demonstrated in 65.8% of cases. We could not establish, in our study, the reason for the low detection rate of free air under the diaphragm. In our study, duodenal ulcer perforation was the most common perforation, with a duodenal to gastric ulcer ratio of 12.7:1. This is comparable to a study in Kenya which reported a duodenal to gastric ulcer ratio of 11.5:1 [17]. A high duodenal to gastric ulcer ratio of 25:1 was reported in Sudan [18]. A Ghana study reported a higher incidence of gastric ulcer perforations than duodenal ulcer perforation [19]. Low duodenal to gastric ulcer ratios of 3:1 to 4:1 have been reported in the western world [17, 19]. Gastric ulcer is considered a rare disease in Africa, 6-30 times less common than duodenal ulcers [19, 20]. There was no obvious explanation for these duodenal to gastric ulcer ratio differences. In this study, Graham's omental patch of the perforations with either a pedicled omental patch or a free graft of omentum was the operation of choice in our centre. A similar surgical treatment pattern was reported in other studies [9, 14, 21, 22]. This is a rapid, easy and life-serving surgical procedure that is effective with acceptable mortality and morbidity [22, 23]. Although this procedure has been associated with ulcer recurrence rates of up to 40% in some series, Graham's omental patch of PUD perforations remains a surgical procedure of choice in most centres, and the recurrence, the procedure should be followed by eradication of H. pylori [22, 24]. Simple closure of perforation with an omental patch and proton pump inhibitors have changed the traditional definitive peptic ulcer surgery of truncal vagotomy and drainage procedures [25]. Definitive surgery is indicated only for those who are reasonably fit and presented early to the hospital for surgery [22]. Definitive peptic ulcer surgery increases operative time, exposes the patient to prolonged anaesthesia, and increases the risk of postoperative complications. This is especially true in developing countries, including Africa, where patients often present late with severe generalized peritonitis [26]. In the present study, only one patient who presented early with a stable haemodynamic state underwent definitive peptic ulcer surgery of truncal vagotomy and drainage. Recently, laparoscopic repair of perforated peptic ulcers has also been reported, which is believed to help reduce postoperative morbidity and mortality [27, 28]. The laparoscopic technique enclosing perforated peptic ulcers is being practised in several centres in developed countries. Still, it has not yet been tried in any of our hospitals in this country [27, 28]. The overall complication rate in this series was 29.8% which is comparable to what was reported by others [14, 29]. A high complication rate was reported by Montalvo Javé *et al*., [30]. This difference in complication rates can be explained by differences in antibiotic coverage, meticulous preoperative care and proper resuscitation of the patients before operation, improved anaesthesia and a somewhat better hospital environment. In other studies, surgical site infection was the most common complication [21-23]. The high surgical site infection rate in the present study may be attributed to contamination of the laparotomy wound during the surgical procedure. A perforated peptic ulcer is a serious condition with an overall reported mortality of 5%-25%, rising to as high as 50% with age [11, 30, 12, 29]. In this study mortality rate was high in patients who had aged ≥ 40 years, delayed presentation (>24 hrs), shock at admission (systolic BP < 90 mmHg), HIV positivity, and low CD4 count (< 200 cells/µl) and concomitant diseases. Also, gastric ulcers were associated with increased mortality risk. Boey's score, which is a score based on scoring factors such as shock on admission, confounding medical illness, and prolonged perforation, is a useful tool in predicting outcomes [32]. In this study, the Boey score was a good predictor of mortality and postoperative complication and, therefore, should be used in our setting as a tool for predicting outcomes in patients with perforated peptic ulcers. Since tests for detecting H. Pylori were not possible in our patients due to logistic problems, we did not consider this in our discussion. However, using the 'triple regime' produced excellent results in 82.6% of our patients, comparable to the results from recent studies, which have successfully used simple closure followed by eradication of H-Pylori as a treatment for perforated peptic ulcers [9, 14, 21, 22, 33].

Limitations of the study

The study was conducted in a single hospital with small sample size. So, the results may not represent the whole community.

CONCLUSION AND RECOMMENDATIONS

Peptic ulcer perforation has become a common health problem that affects young adults, especially males. Helicobacter pylori infection, dietary habits like spicy and oily foods, smoking, alcoholism or drugs like NSAIDs are the risk factors associated. Perforations, once they occur, require a surgical emergency, and the most commonly used treatment modality is closure with a mental patch. Each treatment for perforated ulcer is a

critical factor in minimizing complications and mortality.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee.

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