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Original Article

Early Postoperative Complications of Duodenal Ulcer Perforation: Study in a Tertiry Care Hospital in Bangladesh

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ABSTRACT

Perforation is a common complication of peptic ulcers. Due to rapidly spreading peritonitis, perforation is a life-threatening complication of peptic ulcer disease. It is associated with a high rate of mortality and morbidity. It needs prompt resuscitation and urgent, appropriate surgical management to reduce morbidity and mortality. This prospective observational study was conducted in the Department of Surgery, Jalalabad Ragib-Rabeya Medical College Hospital, Sylhet, from January 2021 to December 2023 to see early postoperative complications of duodenal ulcer perforation. Sixty duodenal ulcer perforations underwent open repair with omental patch and aged 18 to 60 years were enrolled. All patients were male. The mean age of the patients was 36.43±8.02 years (range, 24-60 years) and 46.7% were within the 31 to 40 years age group. Fifty percent of patients came to the hospital after 48 hours of symptoms. Site of the perforation was in the anterior wall of the first part of the duodenum in all cases. Peritoneal fluid was purulent (80.3%), fibrinous (10%) and bilious (6.7%). The size of the perforation was between 5 to 10 mm in 58.3% of cases, <5 mm in 21 35% and >10 mm in 6.7% of cases. Early postoperative complications were pneumonia (35%) followed by wound infection (28.3%). Mortality was 1.7%. The mean length of postoperative hospital stay was 10.28±2.92 days (range, 4-22 days). In most of the cases, the duration of operations was within 60 to 75 minutes (46.7%). In conclusion, duodenal ulcer perforation is more common in males and young adults. Early postoperative complications are high. Pulmonary infection and wound infections are the most common complications.

Keywords: *Duodenal ulcer, Perforation, Postoperative, Morbidity, Mortality.*

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INTRODUCTION

Perforation is a common complication of peptic ulcer. Perforated duodenal ulcer is mainly a disease of young men, but because of increasing smoking in women and use of NSAIDs in all age groups, nowadays it is common in all adult populations[1]. The incidence of peptic ulcer perforation rose from 1.6% in 1998 to 5.3% in 2002 and was established at 5% and overall accounted for 4.6% of acute abdomen. A common site of perforation is the first part of the duodenum and the prepyloric region of the stomach anteriorly[2].

Due to rapidly spreading peritonitis, perforation is a life-threatening complication of peptic ulcer disease, and it is associated with a high rate of mortality and morbidity. It needs prompt resuscitation and urgent, appropriate surgical management to reduce morbidity and mortality[3]. In spite of good management, there is about 30-50% mortality of duodenal ulcer perforation in older patients[4]. Preoperative shock, sepsis, and multi-organ failure are reported to be the leading causes of death in most patients with peptic ulcer

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perforation[5,6].

Free perforation into the general peritoneal cavity can be a catastrophic event, the signs and symptoms of which do not usually cause problems in diagnosis[7]. Once the diagnosis of perforation has been made, it is generally agreed that emergency surgery should be performed as soon as the patient has been adequately resuscitated[5].

Accepted therapeutic options are either simple closure or immediate definitive operation. Simple closure of a perforated peptic ulcer is a standard operation at many centres as a quick, straightforward procedure. Duodenal ulcer perforation is a common surgical emergency in surgery department; however, most of the patients present late (usually after 2-3 days) because of illiteracy, poverty and ignorance. In addition, most of the patients are admitted under the care of general practitioners for the first 1 or 2 days[8].

Suture closure of a perforated duodenal ulcer is an emergency and contaminated surgery. So, patients may frequently develop post-operative complications like wound sepsis, pneumonia, paralytic ileus, septicaemia, shock, renal failure, electrolyte imbalance, duodenal fistula, intrabdominal abscess, burst abdomen, etc[9].

This study was conducted to analyse the short-term outcome of duodenal ulcer perforation treated with simple closure in terms of associated complications, mortality and duration of hospital stay.

MATERIALS AND METHODS

This observational study was conducted in the Department of Surgery, Jalalabad Ragib-Rabeya Medical College Hospital, Sylhet, from January 2021 to December 2023. Patients aged 18 to 60 years, of both sexes, with duodenal ulcer perforation who underwent open repair with omental patch and thorough peritoneal toileting with normal saline were enrolled. Patients with major comorbidities such as diabetes mellitus, jaundice, chronic kidney disease, malignant disease, or active tuberculosis, or with symptoms of more than 10 days' duration were excluded. After admission, patients with suspected duodenal ulcer perforation underwent detailed history taking, including the onset, duration, and character of pain, and thorough clinical examinations. Relevant diagnostic investigations included a chest X-ray in erect posture and plain abdominal X-ray in left lateral decubitus position. Patients who met the inclusion criteria were included in the study. Sixty patients with duodenal ulcer perforation were selected in this manner.

After haemodynamic stabilization (pulse ≤100/min, systolic blood pressure >100 mmHg, and urine output >30 ml/min) and obtained informed written consent, patients were taken to the operating theatre. All patients received ceftriaxone and metronidazole immediately after admission, which was continued for 7 days post-operatively. Under general anaesthesia, a laparotomy was performed through an upper midline incision. The perforation site was identified and closed transversely with interrupted 2/0 atraumatic vicryl sutures, reinforced with an omental patch. Thorough peritoneal toileting was performed in all cases with normal saline, and a drain tube was placed in Morrison's pouch. The peritoneum and rectus sheath were closed with a continuous, single-layer mass closure using 1-prolene. The skin was closed with interrupted 3/0 prolene sutures. Patients remained in the recovery room for at least 12 hours, and after full recovery from anaesthesia, they were transferred to the general ward. Post-operative care and follow-up were continued throughout their hospital stay. Post-operative fluid and electrolyte management, antibiotics, and analgesics were continued. The wound was inspected daily from the 3rd to the 8th post-operative day for signs of wound infection using the ASEPSIS score[10]. Other post-operative complications were recorded and promptly addressed. Skin sutures were removed on the 8th post-operative day in uncomplicated cases. Upon discharge, all patients were advised to return to the outpatient department for a follow-up appointment 4 weeks after surgery. Ethical issues were maintained properly. Statistical analysis was performed manually and using SPSS (Statistical Package for the Social Sciences) version 21.0 for Windows. Mean and standard deviation were calculated for continuous data, and percentages were calculated for categorical data.

RESULTS

Out of 60 patients, 46.7% were within the 31 to 40 years age group, followed by 28.3% within the 24 to 30 years, 20% between 41 and 50 years and 5% within the 51 to 60 years age group. The mean age of the respondents was 36.43±8.02 years (range 24-60 years). All patients were males. The mean time lapse in hospitalisation was 44.08±18.29 hours (range 15-106 hours). Forty-five

Table-I: *Baseline characteristics of the patients (n=60).*

Baseline characteristics	Frequency	Percentage
Age (years)		
24-30	17	28.3
31-40	28	46.7
41-50	12	20
51-60	3	5
Time lapse in hospitalization (hours)		
15-24	10	16.7
25-48	20	33.3
49-72	27	45
>72	3	5

Table-II: *Operative findings (n=60).*

Operative findings	Frequency	Percentage
Peritoneal cavity		
Purulent exudate	50	83.3
Bilious exudate	4	6.7
Fibrinous exudate	6	10
Size of perforation		
<5 mm	21	35
5-10 mm	35	58.3
>10 mm	4	6.7

Table-III: *Distribution of the patients by early postoperative complications (n=60).*

Complications	Frequency	Percentage
Morbidity		
Wound infection	17	28.3
Wound dehiscence	3	5
Pneumonia	21	35
Leakage	2	3.3
Intra-abdominal abscess	2	3.3
Mortality		
Death	1	1.7
Survive	59	98.3

Table-IV: *Distribution of the patients according to duration of operation (n=60).*

Duration of operation (minutes)	Frequency	Percentage
45-60	17	28.3
60-75	28	46.7
75-90	12	20
90-105	03	5

percent of patients came to the hospital between 49-72 hours, 33.3% of patients between 25-48 hours, 16.7% of patients between 15-24 hours, and 5% of patients above 72 hours (table-I). The site of the perforation was in the anterior wall of the first part of the duodenum in all (100%) cases. The size of the perforation was between 5 to 10 mm in 35 (58.3%) patients, less than 5 mm in 21 (35%) patients and larger than 10 mm in 4 (6.7%) patients (table-II). Early postoperative complications were wound infection 17 (28.3%), pneumonia 21 (35%), wound dehiscence 3 (5%), leakage 2 (3.3%) and intra-abdominal abscess 2 (3.3%). Mortality was 1.7% (table-III).

The mean length of postoperative hospital stay of was 10.28±2.92 days (range, 4-22 days). The duration of operations was 60 to 75 minutes in 46.7% of cases, 45 to 60 minutes in 28.3% of cases, 75 to 90 minutes in 20% of cases and 90 to 105 minutes in 5% of cases (table-IV).

DISCUSSION

In this study, the mean age of the respondents was 36.43±8.02 years (range, 24-60 years). This result correlated with several studies[1,9,11]. But a higher mean (51.76±11.49 years) was also reported[2]. This study also revealed that 46.7% of patients were within the 31 to 40 years age group, followed by 28.3% within the 24 to 30 years, 20% between 41 and 50 years and 5% within the 51 to 60 years age group. In this regard, Jordan et al.[12] reported that the peak incidence of duodenal ulcer perforation was in the 4th decade (31 to 40 years) and the incidence was 30%. Hannan et al.[9] showed 34% of patients were between 30-40 years of age. Nuha and Kassama[13] reported 21.9% of cases in the age group of 30 to 39 years. Both studies supported the present study.

In the present study, all patients were male. This result was consistent with the study of Hannan et al[9]. But 6.7-15.3% of females were reported in other studies[1,2,8].

In the present study, the mean time lapse in hospitalisation was 44.08±18.29 hours (range 15-106 hours) and 45% of patients came to the hospital between 49-72 hours, 33.3% of patients between 25-48 hours, 16.7% of patients between 15-24 hours, and 5% of patients above 72 hours. Sarda and Garg[14] found that 37.3% of patients came to the hospital between 34-48 hours, 36% of patients within 24 hours and 26.7% after 48 hours. Ali et al.[4] found that 47.3% presented within twenty-four hours of onset of symptoms, 25.5% between 24 and 48 hours and 16.4% over three days afterwards. In Arven et al.[15] and Dakubo et al.[16] studies, 52.6% and 46.2% reached within 24 hours, respectively. Nasio and Saidi[17] found that the majority (57%) of patients had treatment 48 hours after the onset of symptoms. Reducing the surgical delay is the primary factor of importance to treat the patients with perforated peptic ulcer. In fact, a delay of each hour decreases the probability of survival by 2.4%[18]. The reasons for the treatment delays were not clear. This could have both pre-hospital and intra-hospital components. Patient choices are an important cause of treatment delays. Hospital treatment is expensive and the patients may seek care only when the pain is unbearable. Patients may take medications in the pre-hospital period with the hope that the symptom will abate. It is also possible that some clinicians managing the patients initially may not have considered perforation as a possible diagnosis. The specific patterns and reasons for delay need to be investigated.

Peritoneal fluid in this study was purulent exudate in 83.3% of patients, fibrinous in 10%, and bilious in 6.7% of cases. Hannan et al.[9] found that the nature of peritoneal

fluid was sero-sanguinous in 49%, bilious in 29% and purulent in 22% of cases. Ali et al.[4] found serous peritoneal fluid in 53%, cloudy/opalescent peritoneal fluid in 24% and frank peritoneal pus with fibrinoid adhesions in 24% of patients.

The site of the perforation was in the anterior wall of the first part of the duodenum in all (100%) cases. This result correlated with Hannan et al.[9] where they found that all perforations were present in the anterior wall of the first part of the duodenum. Nasio and Saidi[17] found that the site of perforation was the anterior wall of the first part of the duodenum in most of the cases (96.4%) and 3.6% of perforations were identified as posterior duodenal.

The size of the perforation was between 5 to 10 mm in 35 (58.3%) patients, less than 5 mm in 21 (35%) patients and larger than 10 mm in 4 (6.7%) patients. This result was supported by Elnagib et al.[19] who found that the size of the perforation was 5-10 mm in 55.6% of patients. In this regards, Hannan et al.[9] found that the size of the patient was less than 5 mm in 64% of patients, between 5 to 10 mm in 27% of patients and larger than 10 mm in 9% of patients. Arumugam et al.[20] found that the size of the perforation was >0.5 mm in 46% of patients and <0.5 mm was noted in 54% of patients.

Early postoperative complications were wound infection in 17 (28.3%), pneumonia in 21 (35%), wound dehiscence in 3 (5%), leakage in 2 (3.3%) and intra-abdominal abscess in 2 (3.3%) patients. This result correlated with Sarda and Garg[14] where they found that post-surgical complications were wound infection (30.6%) followed by chest infection (28%). Hannan et al.[9] found 21% of their patients developed one or more complications. Arumugam et al.[20] found that 17.2% of patients had wound infection, 6.4% of patients had septicaemia, electrolyte abnormalities were encountered in 21% of patients, and the morbidity rate was 17.02%. Ali et al.[4] found that 56.3% of patients had a smooth unremarkable postoperative course, while 43.7% developed one or more of the complications, like fever (36.4%), wound infection (21.8%), chest infection (20%) and intra-abdominal abscesses (5.5%). Baloch et al.[2] found that overall, 32% of patients developed postoperative complications. Wound infection was observed in 23% of patients, pneumonia in 11%, leakage in 6% and subdiaphragmatic abscess in 3% of patients.

In this study, mortality was in 1.7% of patients. This result was consistent with Ali et al.[4] where they found that the mortality rate was 2%. This result was nearly similar to the study of Sarda and Garg[14] where they found that the mortality rate was 2.6%. Bae et al.[21] showed it to be 3.17%.

The mean length of postoperative hospital stay was 10.28±2.92 days (range, 4-22 days). This result was almost similar to the study of Ali et al.[4] which reported that the mean duration of hospital stay was 10 days (range 7-21 days). Arumugam et al.[20] found the average duration of hospital stay to be 8.52 (range 8-15 days). Nasio and Saidi[17] found that the duration of hospital stay ranged from 3 days to 79 days with an average of 15 days. Baloch et al.[2] found the hospital stay ranged from 7 to 20 days (mean 9.76±1.93 days).

CONCLUSION

Duodenal ulcer perforation is more common in males and young adults. Early postoperative complications are high, and pulmonary infections and wound infections are the most common, whereas mortality is 1.7%. Prognostic indicators can assist in risk stratification for duodenal ulcer perforation. The use of this system can help to delineate high-risk patients and to identify the need for early intervention and prompt treatment for a better outcome for the patient.

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