Original Research Article

Study of factors affecting mortality and morbidity in patients presenting with peritonitis due to duodenal ulcer perforation

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Abstract

Background: Peptic ulcer disease in the general population had lifetime prevalence of 5-10% with incidence of 0.1–0.3% per year. Despite the tremendous improvement in preventive therapies, the rate of complication of this disease is still high and is burdened by high morbidity and mortality. In present study, we aimed to study factors affecting mortality and morbidity in patients presenting with peritonitis due to duodenal ulcer perforation at our tertiary hospital. **Material and Methods:** Present study was single-center, prospective, observational study conducted in patients admitted, diagnosed with duodenal ulcer perforation and surgically treated at our hospital. **Results:** In present study period total 56 patients were studied. All were male, most common age group was 51-60 years (37.5%) followed by 41-50 years (23.21%). Duration from onset of symptoms to admission was >24 hours (30.36%) in most of patients followed by 12-24 hours (28.57%). Most commons symptoms were pain in abdomen (100%), vomiting (100%). Anaemia (37.5%), LRTI and Pulmonary complications (19.64%), Diabetes mellitus (12.5%) and Hypertension (10.71%) were common comorbidities noted. Associated risk factors were previous history of PUD (41.07%), Alcohol use (64.29%), Cigarette smoking (51.79%) and Use of NSAIDs (12.5%). Presence of free gas under diaphragm was noted in 83.93% patients. Intraoperatively duodenal perforation diameter was 1–5 mm (60.71%) in most of patients followed by 6–10 mm (23.21%). Only 1 patient had duodenal perforation diameter was > 20mm. Common postoperative complications were wound infection (37.5%) and pulmonary infection (21.43%). In present study mortality within 1 month was noted in 13 patients (23.21%). Most common factors related to mortality were delayed presentation > 24 hours (61.54%), age > 60 years (46.15%), diabetes mellites (38.46%), Size of perforation > 1 cm (38.46%) and septicaemic shock (23.08%). **Conclusion:** Delayed presentation > 24 hours, age > 60 years size of perforation > 1 cm were common factors related to mortality in duodenal ulcer perforation patients.

Keywords: duodenal ulcer perforation; Peritonitis, Omentopexy, mortality

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INTRODUCTION

Perforated peptic ulcer is the most common cause among all causes of gastrointestinal tract perforations which is an emergency condition of the abdomen that requires early recognition and timely surgical management,[1] associated with short term mortality and morbidity in up to 30% and 50% of the total patients' respectively. [2] Peptic ulcer disease in the general population had lifetime prevalence of 5-10% with incidence of 0.1–0.3% per year. [3] The prevalence of H. pylori in the low socioeconomic classes and associated poverty, overcrowding, and poor hygiene have increased the incidence of duodenal and gastric perforations in all age groups particularly in the developing world.[4] H. pylori infection have increased resting and

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meal-stimulated gastrin levels and decreased gastric mucus production and duodenal mucosal bicarbonate secretion, all of which favor ulcer formation. Peptic ulceration occurs due to acid peptic damage to the gastro-duodenal mucosa, resulting in mucosal erosion that exposes the underlying tissues to the digestive action of gastro-duodenal secretions. The vast majority of perforations occur on the anterior side (only a few perforate on the posterior side and are covered perforations) and usually in the distal part (stomach) or the bulbous region (duodenum). The sudden release of gastric or duodenal contents into the peritoneal cavity through a perforation leads to a devastating sequel of events, Despite the tremendous improvement in preventive therapies, the rate of complication of this disease is still high and is burdened by high morbidity and mortality. In present study, we aimed to study factors affecting mortality and morbidity in patients presenting with peritonitis due to duodenal ulcer perforation at our tertiary hospital.

MATERIAL AND METHODS

Present study was single-center, prospective, observational study conducted in Department of Surgery, Government Doon Medical College, Dehradun, from March 2019 to February 2020. It was hospital based, observational study.

Inclusion criteria

Patients admitted, diagnosed with duodenal ulcer perforation and surgically treated at our hospital.

Exclusion criteria

Intraoperative patients diagnosed as gastric ulcer perforation.

A written informed consent was taken from patients or relatives for participation in study. After initial assessment and stabilisation, detailed history and other details (age, sex, occupation, clinical presentation, duration of symptoms) were collected. Diagnosis finalised based on clinical findings after a thorough examination, paracentesis (if needed) and investigations like plain Xray of erect abdomen. Routine investigations (CBC, LFT, RFT, urine microscopy, ABG, X ray abdomen erect) were done in all patients. All cases were managed surgically by Graham's omentoplasty. Final confirmation of diagnosis was intraoperative only. Intraoperative details (site and size of perforation, amount of peritoneal contamination, complications) were noted. Treatment, clinical course and postoperative complications were duly noted. Patients were discharged with advice regarding diet, rest, drugs to be taken and need for periodic check-up after satisfactory improvement. At follow up after 6 months, upper GI endoscopy was done to rule out chronic duodenal ulcer, if there is no response to conventional medical treatment. Data was collected and analysed using Microsoft Excel. Statistical analysis was done using descriptive statistics.

RESULTS

In present study period total 56 patients were studied. All were male, most common age group was 51-60 years (37.5 %) followed by 41-50 years (23.21%).

Table 1: Age wise distribution

Age (years)	No. of Patients	Percentage (%)
19-30	1	1.79
31-40	3	5.36
41-50	13	23.21
51-60	21	37.5
61-70	11	19.64
≥ 71	7	12.5

Duration from onset of symptoms to admission was >24 hours (30.36 %) in most of patients followed by 12-24 hours (28.57%). Most commons symptoms were pain in abdomen (100%), vomiting (100%). Anaemia (37.5%), LRTI and Pulmonary complications (19.64 %), Diabetes mellitus (12.5 %) and Hypertension (10.71%) were common comorbidities noted. Associated risk factors were previous history of PUD (41.07%), Alcohol use (64.29%), Cigarette smoking (51.79%) and Use of NSAIDs (12.5%). Presence of free gas under diaphragm was noted in 83.93% patients.

Table 2: General characteristics

Characteristics	No. of Patients	Percentage (%)
Duration from onset of symptoms to admission (in hours)		
0-6	8	14.29
6-12	15	26.79
12-24	16	28.57
>24	17	30.36
Symptoms		0
Pain abdomen	56	100

Vomiting	56	100
Abdomen Distension	43	76.79
Constipation / Loose stools	39	69.64
Fever	13	23.21
Co-morbidity		
Anaemia	21	37.5
LRTI and Pulmonary complications	11	19.64
Diabetes mellitus	7	12.5
Hypertension	6	10.71
None	26	46.43
Associated risk factors		
Previous history of PUD	23	41.07
Alcohol use	36	64.29
Cigarette smoking	29	51.79
Use of NSAIDs	7	12.5
Other		
presence of free gas under diaphragm.	47	83.93

Intraoperatively duodenal perforation diameter was 1–5 mm (60.71 %) in most of patients followed by 6–10 mm (23.21 %). Only 1 patient had duodenal perforation diameter was > 20mm.

Table 3: Size of duodenal perforation

Perforation diameter in mm	No. of patients	Percentage
1–5	34	60.71
6–10	13	23.21
11–15	5	8.93
16–20	3	5.36
>20mm	1	1.79

Common postoperative complications were wound infection (37.5 %) and pulmonary infection (21.43 %).

Table 4: Postoperative complications.

Postoperative complication	No. of patients	Percentage
Wound infection	21	37.5
Pulmonary infection	12	21.43
Intra-abdominal abscess	5	8.93
Septicaemic shock	4	7.14
Burst abdomen	3	5.36

In present study mortality within 1 month was noted in 13 patients (23.21 %). Most common factors related to mortality were delayed presentation > 24 hours (61.54 %), age > 60 years (46.15 %), diabetes mellites (38.46 %), Size of perforation > 1 cm (38.46 %) and septicaemic shock (23.08 %).

Table 5: Factors related to mortality

Factors	No. of patients (n=13)	Percentage
Delayed presentation > 24 hours,	8	61.54
Age > 60 years	6	46.15
Diabetes mellites	5	38.46
Size of perforation > 1 cm	5	38.46
Septicaemic shock	3	23.08

DISCUSSION

Pathology of duodenal ulcer perforation is traditionally related to a hypersecretory acid environment, dietary factors and stress. However, the increasing incidence of the Helicobacter pylori infection, the extensive use of NSAIDs, and the increase in alcohol and smoking abuse have changed the epidemiology of this disease.[5] Furthermore, iatrogenic duodenal perforations are becoming more common following the widespread use of endoscopic procedures, such as endoscopic retrograde cholangiopancreatography (ERCP).[6] Most ulcers that perforate are on the anterior wall of the duodenum or stomach. The release of food and digestive enzymes into the peritoneal cavity initially causes a chemical peritonitis. Secondary bacterial peritonitis evolves later, and as with bleeding ulcers 10% of these patients will die.[7,8] The

clinical presentation of gastroduodenal perforation is usually sudden onset of abdominal pain. Localized or generalized peritonitis is typical of perforated peptic ulcer, but may be present in only two-thirds of the patients.[5,9] G Bas *et al.* stated in their study that recognition of symptoms was significantly later in elderly patients thereby therapeutic delay increasing the mortality rate from 0–20%.[10] Similar findings were noted in present study. The diagnosis is made clinically and confirmed by presence of gas under diaphragm on radiograph, but absence does not exclude the presence of perforation. When chest x-ray does not show pneumoperitoneum, or a relatively well-patient with a sealed perforation and uncertain diagnosis, a contrast enhanced computed tomography scan (CECT) of the abdomen is useful as it has a high diagnostic accuracy of 98%.[11] Pavan Kumar *et al.*,[12] studied 50 cases of duodenal ulcer perforation (DUP), abdominal pain was the most common symptom and abdominal tenderness, rigidity, obliteration of liver dullness were important signs. Larger sized perforation, late presentation to hospital, associated co-morbid medical illness and presence of preoperative shock; all have negative impact on outcome. H. pylori eradication treatment is mandatory after simple closure of the perforation to prevent recurrence. Rohit DK *et al.*,[13] studied 45 patients, most of were male, presented with clinical signs of peritonitis between 24-48 hours after onset of the pain. Among the patients of peptic ulcer perforation, duodenal perforation (93.3%) is more common and which is the most common cause of perforation peritonitis. Exploratory laparotomy with simple closure of perforation with omental patch was done in all cases. The most common post-operative complication was wound infection (57.5%). The overall mortality was 11.1%. In study by G Kishore Babu *et al.*,[14] most common age group is 60–70 years. Male to female ratio of 7:1. Highest incidence occurred during the months of September and October. Common precipitating factors were smoking, alcohol, NSAIDS. Among 110 patients 12 presented in shock, with mortality of 66%. Delayed presentation > 24 hours, Size of perforation > 1 cm, peritoneal contamination > liter were associated with increased mortality. Common postop complications were wound infection, Pneumonia. Mortality is more in elderly age group that is in patients more than 60 years of age. Similar findings were noted in present study. Kumar *et al.* stated that ulcer perforation greater than 5 mm is an independent risk factor for releak when simple closure with omental patch alone is performed.[15] Current reports advocate omental patch closure only, often laparoscopically with postoperative anti H. pylori therapy.[16,17] Several different procedures, such as a jejunal serosal patch, Roux en-Y duodenojejunostomy, pyloric exclusion, and several variations of omental plugs have been described for large duodenal defects when the defect is felt too large to perform a primary repair. World society of emergency surgery guidelines recommended tailored approach based upon the location of the ulcer for the treatment of perforated duodenal ulcers. In case of large duodenal ulcers, we suggest considering the need of resections or repair plus/minus pyloric exclusion/external bile drainage and duodenostomy only in extreme circumstances Laparoscopic approaches to closure of duodenal perforation are now being applied widely and may become gold standard in the future especially in patients with perforations less than 10 mm size presenting within the first 24 hours of onset of pain.[20]

CONCLUSION

Perforation of the duodenum with spillage of intraluminal contents into the peritoneal cavity is a serious health concern. Delayed presentation > 24 hours, age > 60 years size of perforation > 1 cm were common factors related to mortality in duodenal ulcer perforation patients.

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