

A Study of Duodenal Ulcer Perforation Post-operative Outcome in A Tertiary Center

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Abstract

Introduction: Time trends in the epidemiology of perforated peptic ulcer disease reflect complex, multifactorial etiologies. Based on today's fast and instant lifestyle, it is evident that the epidemiology of peptic ulcer disease largely reflects environmental factors, primarily *Helicobacter pylori* infection, nonsteroidal anti-inflammatory drug (NSAID) use, and smoking.

Aim: The aim is to study the relationship between post-operative morbidity and comorbid illness and pre-operative risk factors in cases of duodenal ulcer perforation.

Methods: All non-malignant and non-traumatic duodenal ulcer perforation cases above the age of 12 years were taken. A total of 50 cases of duodenal perforation were studied over 18 months. The patients were treated with perforation closure with live omental patch repair after initial resuscitation and correction of electrolyte imbalances under the cover of broad-spectrum antibiotics.

Results: 24 patients had smoking history and 19 patients had history of alcohol consumption. 29 patients had the previous history of peptic ulcer disease. 17 patients had the history of NSAID intake. The size of the perforation >0.5 mm was noted in 23 patients. The amount of peritoneal contamination >1 L was noted in 29 patients. 8 patients had wound infection, 3 patients had septicemia, electrolyte abnormalities were encountered in 21% of patients, and morbidity rate was 17.02%.

Conclusion: Age, associated comorbid conditions, duration of symptoms, and clinical condition at the time of presentation all contribute in determining the post-operative morbidity and mortality.

Key words: Duodenal ulcer, Morbidity, Perforation

INTRODUCTION

Duodenal ulcers occur due to an imbalance between gastroduodenal mucosal defense mechanisms and the damaging forces, particularly gastric acid and pepsin. Hyperacidity is not a prerequisite for duodenal ulcers. Failure of mucosal defenses against gastric acid and pepsin results in ulceration. The sudden release of gastric or duodenal contents into the peritoneal cavity through the

perforation can lead to a sequence of events, which if not managed properly can result in mortality.^[1,2] In spite of the development in diagnostic and treatment modalities in peptic ulcer disease, the incidence of duodenal perforation seems to be unchanged and even increased incidence has been reported in older age groups. Mortality is influenced by a number of factors which include patients age, sex, site of the ulcer, treatment delay, concurrent disease, pre-operative shock, and type of anesthesia used.^[3] A majority of the factors are interrelated, and for instance, the treatment delay is likely to increase the mortality rate. Despite a lot of evidence in the literature, the knowledge regarding factors influencing the mortality that occurs after peptic ulcer perforation is limited.^[4,5] The purpose of this study is to find the factors that influence the mortality and morbidity among operated cases of duodenal

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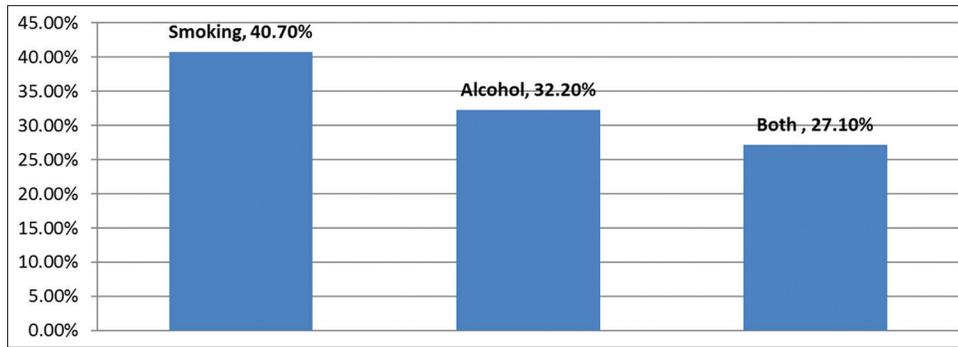


Figure 1: Distribution of personal habits

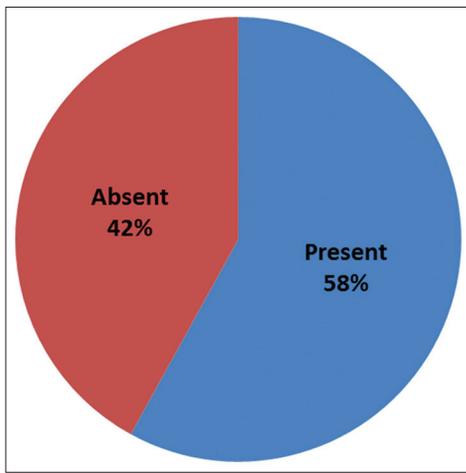


Figure 2: Distribution of peptic ulcer disease

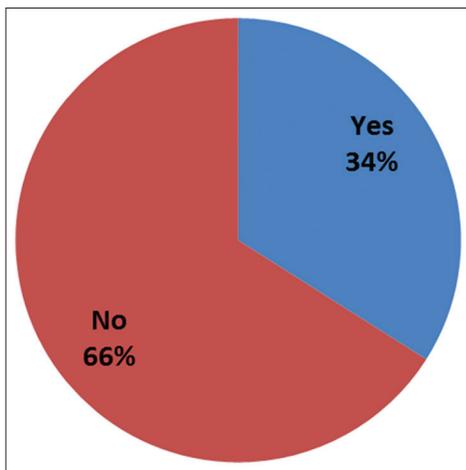


Figure 3: Distribution of nonsteroidal anti-inflammatory drug intake

ulcer perforation. There are multiple numbers of factors affecting the mortality and morbidity which would be dealt with in this study.

Aim

The aim is to study the relationship between post-operative morbidity and comorbid illness and pre-operative risk factors in cases of duodenal ulcer perforation.

MATERIALS AND METHODS

This study comprises of prospective analysis of the patients diagnosed with duodenal ulcer perforation in Tirunelveli Government Medical College, Tirunelveli.

Inclusion Criteria

All non-malignant and non-traumatic duodenal ulcer perforation cases above the age of 12 years were included in the study.

Exclusion Criteria

Traumatic perforation and perforated malignant ulcers were excluded from the study. The following data were collected from the hospital records such as age, sex, previous history of ulcer, nonsteroidal anti-inflammatory drugs (NSAID) intake, duration of symptoms, size of perforation, and the amount of peritoneal contamination. The outcome of treatment was elaborated by post-operative complications, hospital stay, and death.

A total of 50 cases of duodenal perforation were studied over 18 months. Of these 50 cases, 47 undergone laparotomy, and the perforation in all these cases was present in the anterior aspect of the first part of the duodenum. The patients were treated with perforation closure with live omental patch repair after initial resuscitation and correction of electrolyte imbalances under the cover of broad-spectrum antibiotics.

All the patients were continued treatment with anti-*Helicobacter pylori* regimen postoperatively.

RESULTS

In this study, 7 female and 43 male patients were enrolled. Most of the cases were in the more than 40 years age group. 24 patients had smoking history and 19 patients had a history of alcohol consumption [Figure 1]. 29 patients had the previous history of peptic ulcer disease [Figure 2]. 17 patients had the history of NSAID intake

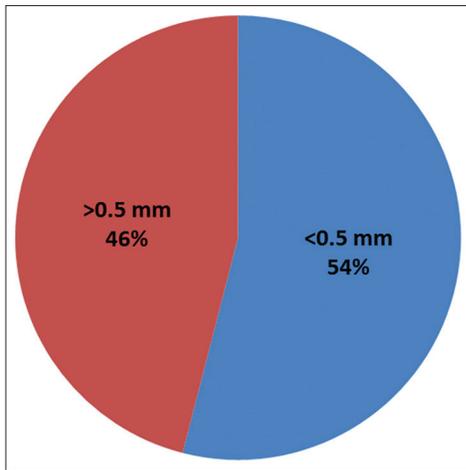


Figure 4: Distribution of size of perforation

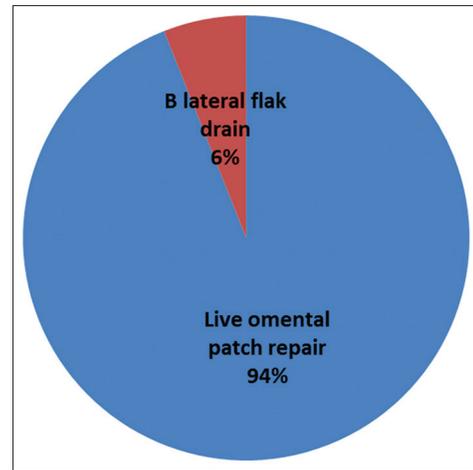


Figure 6: Management

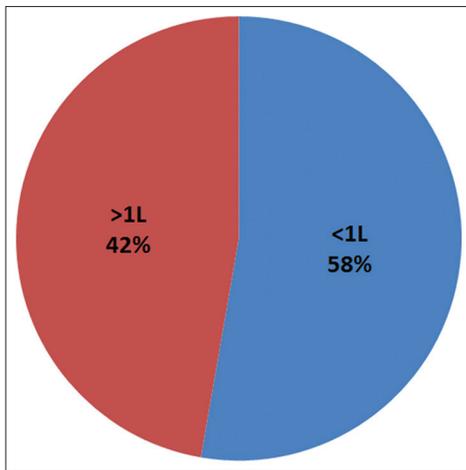


Figure 5: Distribution of amount of peritoneal contamination

[Figure 3]. The size of the perforation >0.5 mm was noted in 23 patients [Figure 4]. The amount of peritoneal contamination >1 L was noted in 29 patients and <1 L was noted in 21 patients [Figure 5]. Of 50 patients, 47 cases were treated with simple closure with omental patch. 3 cases were treated with B/L flank drain under local anesthesia because of poor general condition of the patient [Figure 6]. The average duration of symptoms was found to be 1.24 days (1–4 days). Average delay from the time of admission to surgery is 3.48 h (2–6 h). Average duration of hospital stay found to be 8.52 (8–15 days). Of total, 47 cases had undergone surgery, 8 patients had wound infection, 3 patients had septicemia, electrolyte abnormalities were encountered in 21% of patients, and morbidity rate was 17.02%. Of total cases 50, 6 patients expired due to septicemia, and mortality rate was 12%.

DISCUSSION

No single factor can readily identify patients at high risk for a poor outcome, but older age, presence of comorbidity,

Table 1: Peak incidence

Author	Years
Taylor ^[9]	>50
Hannan <i>et al.</i> ^[10]	31–40
Our study	40–49

Table 2: Gender incidence

Authors	Male-to-female ratio
Paul and Jack ^[11]	26:1
Rodney Maingot ^[12]	5:1
Our study	16:1

and delay to surgery have consistently been associated with higher risk of death. Clearly, identification of modifiable risk factors with the potential to improve outcome is of greatest interest. In a systematic review covering over 50 studies with 37 pre-operative prognostic factors comprising a total of 29,782 patients, risk factors consistently associated with mortality were found. Only two-thirds of the studies provided confounder-adjusted estimates [Tables 1 and 2].^[6]

Sepsis is frequently present and a leading cause of death in patients with perforated peptic ulcer (PPU). An estimated 30–35% of patients with PPU have sepsis on arrival at the operating theater, and sepsis is believed to account for 40–50% of fatalities. Within 30 days of surgery, >25% of the patients develop septic shock,^[7] which carries a mortality rate of 50–60%. Accordingly, investigation and interventions aimed at preventing, detecting, and treating sepsis in PPU patients may reduce mortality and morbidity. This can be accomplished by systematically assessing for the signs of sepsis and treating according to the principles of the surviving sepsis campaign, including fluid resuscitation, cultures, empirical broad-spectrum antibiotics, and source control.^[8] A multidisciplinary perioperative approach based on such principles has been

evaluated in a non-randomized clinical trial for PPU, with a statistically significant reduction in mortality shown (number-needed-to-treat of 10).

The age of patients in this study is ranging from 18 to >60 years. The peak age incidence was between 40 and 49 years, but age is no bar for the perforation.

In the current study of 50 cases, only 7 cases of females with perforated duodenal ulcers were observed. Our study found male predominance for perforated duodenal ulcers which correlates to the reported observation.

Patients aged above 50 years with a history of NSAID intake are at increased risk for duodenal ulcer perforation, and 34% of the patients had a history of NSAID intake.

Chronic use of NSAIDs including low-dose aspirin is associated with gastrointestinal mucosal injury. However, major adverse events are relatively infrequent. Patients with multiple risk factors such as a previous history of peptic ulcer disease, increasing age, coprescription of corticosteroids and anticoagulants, and high-dose and long-term use of NSAIDs are at the highest risk of major gastrointestinal toxicity. In patients with multiple risk factors, physicians need to assess these risks before prescribing NSAIDs and adopt risk-minimizing strategies.^[13]

Patients aged >60 years and associated comorbid illness had the highest rate of wound infection. 17 patients had associated comorbid illness. Of the 8 patients who had wound infection, 6 patients had associated comorbid illness and 50% of them were above 50 years of age. Electrolyte imbalance included hyponatremia in 21% of patients, hypokalemia in 19% of patients, and elevated serum creatinine in 18% of patients. Mortality rate was 12%, of which 3 patients were treated with B/L flank drain because of the very poor general condition of the patient at the time of admission, and all these patients were above the 60 years age group; of the operated patients, 6% mortality is present, and in these patients, there were associated comorbid illness and delay in presentation and amount of peritoneal contamination were all significantly present.

CONCLUSION

Duodenal ulcer perforation is more common in the age group of >40 years. Majority of the patients are male. Associated risk factors include smoking, alcohol intake, NSAID intake, and history of automated peritoneal dialysis. Morbidity rate is 17%, and wound infection and dyselectrolytemia are the most common. Mortality and morbidity are significantly higher in patients with comorbid illness. Age, associated comorbid conditions, duration of symptoms, and clinical condition at the time of presentation all contribute in determining the post-operative morbidity and mortality. Prognostic indicators can assist in risk stratification for PPU. The use of this system can help to delineate high-risk patients and to identify the need of early intervention and prompt treatment for a better outcome of the patient.

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