

Study of Duodenal Ulcer Perforation Post-operative Outcome

T Gnanakkumar

Assistant Surgeon, Department of General Surgery, Government Medical College Hospital, Ramanathapuram, Tamil Nadu, India

Abstract

Background: The epidemiology of perforated peptic ulcer disease has changed throughout time, reflecting complicated, multiple etiologies. It is clear that the epidemiology of peptic ulcer disease is largely influenced by environmental variables, particularly *Helicobacter pylori* infection, alcohol intake, and smoking, given today's rapid and quick lifestyle.

Aim: In cases of duodenal ulcer perforation, the goal is to investigate the association between post-operative morbidity and concomitant illness, as well as pre-operative risk factors.

Materials and Methods: A total of 46 cases were included in study, within the age range of <19 to >60. In this study, we compared the outcomes of perforation closure techniques and open approaches in terms of complications, mortality, and hospital stay.

Results: About 48% patients had smoking history and 31% patients had history of alcohol consumption. About 64% patients had the previous history of peptic ulcer disease. The size of the perforation >0.5 mm was noted in 54% patients. The amount of peritoneal contamination >1 L was noted in 48% patients. Nine patients had wound infection, four patients had septicemia, electrolyte abnormalities were encountered in 19% of patients, and morbidity rate was 8%

Conclusion: Age, concomitant illnesses, the duration of symptoms, and the clinical status at the time of presentation all play a role in post-operative morbidity and death.

Key words: Duodenal ulcer, Morbidity, Perforation, Smoking, Wound infection

INTRODUCTION

Despite the widespread availability of current proton pump inhibitors, duodenal ulcer perforation remains a common occurrence. Duodenal ulcers are caused by an imbalance between the protective systems of the gastroduodenal mucosa and the destructive forces, mainly stomach acid and pepsin.^[1] Duodenal ulcers are not caused by hyperacidity. Ulceration occurs when the mucosal defences against stomach acid and pepsin fail. The rapid discharge of stomach or duodenal contents into the peritoneal cavity through a perforation can set off a chain of events that can result in death if not controlled carefully.^[2]

In spite of advancements in peptic ulcer disease diagnostic and therapeutic approaches, the frequency of duodenal perforation appears to be stable, with an even higher incidence observed in older age groups.^[3] Patients' age, sex, ulcer site, treatment delay, concurrent disease, pre-operative shock, and type of anaesthesia used are all factors that influence mortality. The majority of the factors are interconnected, and treatment delays, for example, are likely to increase death rates. Despite a wealth of evidence in the literature, our understanding of the factors that influence mortality after peptic ulcer perforation is limited.^[4]

Vagotomy was used in the past to lower the recurrence rate of peptic ulcers; however this is no longer essential due to advances in medical therapy.^[5] Primary perforation closure and full peritoneal cavity washout is a straightforward treatment that has become the gold standard. The use of Graham's omental patch to repair an uncomplicated duodenal ulcer perforation can be done laparoscopically in less than 1 h. Furthermore, the use of laparoscopy may minimise the length of stay in the hospital.^[6]

Access this article online



www.ijss-sn.com

Month of Submission : 07-2021
Month of Peer Review : 08-2021
Month of Acceptance : 08-2021
Month of Publishing : 09-2021

Corresponding Author: Dr. T Gnanakkumar, Department of General Surgery, Government Medical College Hospital, Ramanathapuram, Tamil Nadu, India.

Cellan-Jones originally published the pedicled omental patch for “plugging” these perforations in 1929, however it is usually, and incorrectly, credited to Graham, who described the use of a free graft of the omentum to repair the perforation in 1937. This operation involves drawing a strand of omentum across the perforation and holding it in place with full thickness sutures inserted on either side of the perforation, and it has become the “gold standard” for treating such perforations. However, significant duodenal perforations may occasionally be detected, posing a risk of post-operative leakage if the perforation is closed with this simple approach. Other surgical procedures for proper closure may include partial gastrectomy, jejunal serosal patch, jejunal pedicled graft, free omental plug, suturing of the omentum to the nasogastric tube, proximal gastrojejunostomy, or even gastric disconnection.^[7] There is very little information in the literature about the definition, occurrence, and treatment of major duodenal ulcer perforations. This study summarises our experience treating this subset of duodenal ulcer perforations, as well as the factors that determine mortality and morbidity.

MATERIALS AND METHODS

Inclusion Criteria

The study covered all cases of non-malignant and non-traumatic duodenal ulcer perforation in people over the age of 12.

Exclusion Criteria

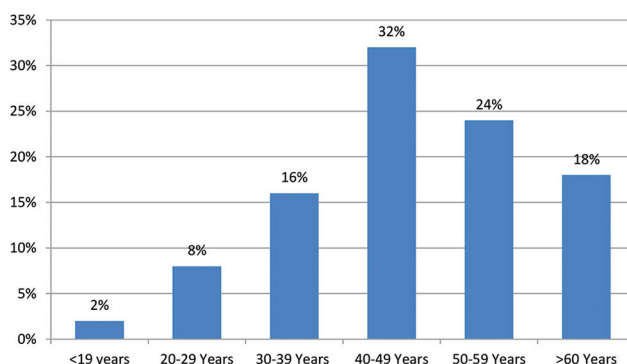
The study eliminated traumatic perforation and perforated malignant ulcers. Age, sex, previous history of ulcer, nonsteroidal anti-inflammatory drug use, duration of symptoms, extent of perforation, and amount of peritoneal contamination were all obtained from hospital records. Post-operative problems, hospitalization, and death all contributed to the treatment’s outcome.

Over the course of 18 months, 50 cases of duodenal perforation were investigated. 47 of the 50 cases required laparotomy, and the perforation was found on the anterior aspect of the first part of the duodenum in all of them. After initial resuscitation and correction of electrolyte imbalances, the patients were treated with perforation closure with live omental patch repair under the influence of broad-spectrum antibiotics.

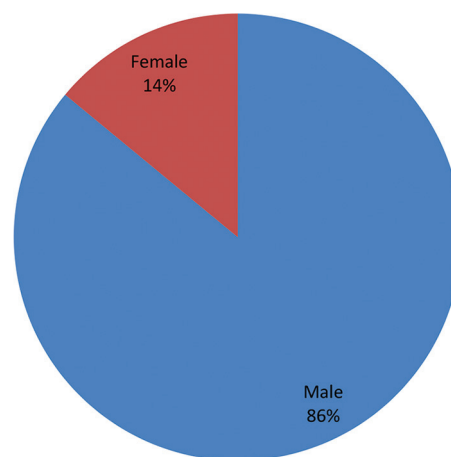
All the patients were continued treatment with anti-Helicobacter pylori regimen postoperatively.

RESULTS

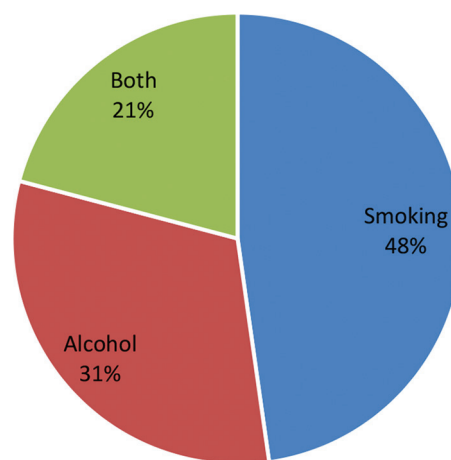
This study enrolls patients in six age groups; <19, 20–29, 30–39, 40–49, 50–59 and >60 years, with a highest patient



% of 32 recorded in group 40–49 followed by 24 in 50–59 year age group. Age groups >60, 30–39, 20–29 and those <19 years displayed 18, 1, 8 and 2% of patients.

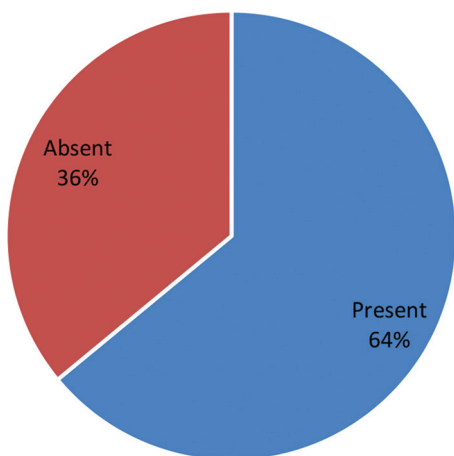


Among the patients enrolled in study, 86% were male and 14% were female.

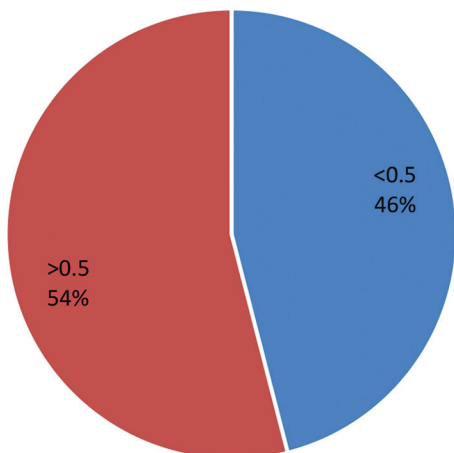


Peptic Ulcer

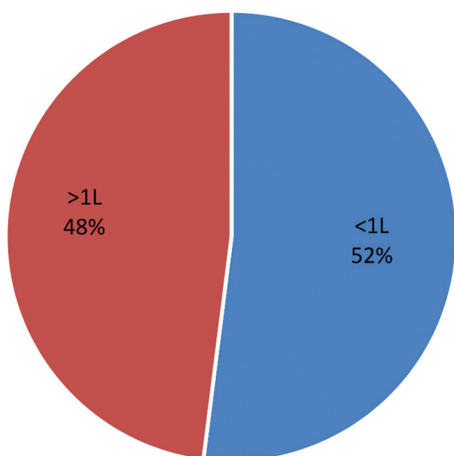
Patients with smoking habits were found to exist in a larger proportion (48%) than those with alcohol consumption (31%). However, those with both smoking and alcohol



consumption habits were found to occur (21%). Duration of symptoms was found to be 1.48 Days (1–4 Days). Average delay from the time of admission to surgery is 4.12 h (2–6 h). About 64% of patients were identified with a previous history of peptic ulcer.



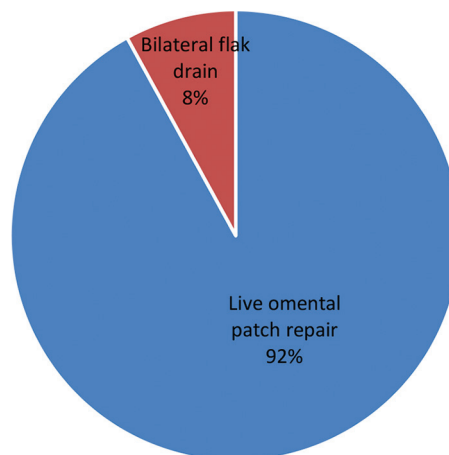
Size of Perforation



Peritoneal Contamination

The size of the perforation >0.5 mm was noted in 54% patients. The amount of peritoneal contamination >1 L

was noted in 48% of patients and <1 L was noted in 52% patients. Among the patients, 92% cases were treated with simple closure with omental patch repair, 2% cases were treated with B/L flank drain.



Management

Average duration of hospital stay found to be 9.25 (9–16 Days). Of total 46 cases had underwent surgery, nine patients had wound infection, four patients had septicaemia. Electrolyte abnormalities were encountered in 19% of patients and mortality rate was 8% due to septicaemia.

DISCUSSION

Despite advances in medical treatment, duodenal ulcer perforation remains a common occurrence. It can affect adults of various ages. Clearly, laparoscopic surgery saves time and money. It should be explored as an option to open repair if knowledge and facilities are available.^[8] Despite a wealth of evidence in the literature, our understanding of the factors that influence mortality after peptic ulcer perforation is limited. In cases of duodenal ulcer perforation, the goal of the current study was to assess the association between post-operative morbidity and concomitant illness, as well as pre-operative risk factors.

A higher incidence duodenal ulcer was recorded among patients within age groups of the 4th and 5th decade, with a predominant occurrence among males (86%). Only 14% of females with perforated duodenal ulcers were found in the current investigation. Male predominance for perforated duodenal ulcers was discovered in our analysis, which matches the stated observation. A similar incidence was reported earlier in the study reported by Arumugam *et al.*^[9] The patients in their study range in age from 18 to 60 years old. The highest age for perforation was between 40 and

49 years old, although there is no age limit for perforation similar to our findings.

In agreement with other studies,^[9,10] more than 60% of patients had no past history suggestive of peptic ulcer disease. As found in our study, risk factors such as smoking and alcohol consumption were also found in patients in a likely investigation earlier reported by Arumugam *et al.*^[9] Current observation reports a durable pain for a period of 1.48 days and a mean delay from the time of admission to surgery to be 4.12 h. According to Gavit *et al.*,^[11] there is a link between the length of symptoms and the post-operative result. Better post-operative outcome was hence observed with earlier the hospitalisation and operation.

Although no single predictor can reliably identify patients at high risk for a bad result, older age, comorbidities, and surgery delay have all been linked to a higher chance of death. Clearly, finding modifiable risk variables that have the potential to enhance outcomes is the most important goal. Risk variables consistently related with death were discovered in a comprehensive review that included over 50 studies with 37 pre-operative prognostic factors and a total of 29,782 patients. Only two-thirds of the studies reported estimates that were adjusted for confounders.^[12]

This study records the most common size of perforation to be >0.5 cm as seen in 54% of cases. A similar perforation size ranging from 0.5 to 3 cm indicating to need of additional procedure to reduce complication was earlier reported by Gavit *et al.*^[11] Peritoneal contamination degree of intensities < and >1L was reported in patients. Higher degree of peritoneal contamination was observed as a significant risk factor for duodenal ulcer in a study previously conducted by Bupicha *et al.*^[13]

Among the patients, 92% of them underwent live omental patch repair and the rest were subjected to bilateral flank drain. Graham's omental patch (Graham's omentopexy) of the perforations was performed in 83.3% of cases as reported by Chalya *et al.*^[14] The median overall length of hospital stay was 9.25 days (9–16 days). Overall length of hospital stay of 14 days was earlier reported by Chalya *et al.*^[14] Patients who developed complications stayed longer in the hospital per their observations. Minimal to fatal complications observed in this study with the most common complication being wound infection, septicaemia as well as electrolyte abnormalities. Mortality due to septicaemia was reported to occur (8%). A similar high recurrence in wound infection was reported by Arumugam *et al.*^[9] They also reported the presence of electrolyte imbalance included

hyponatremia and elevated serum creatinine in their study. The mortality rate was 12%, with three patients receiving B/L flank drains due to the patient's poor general condition at the time of admission, and all of these patients were over 60 years old; of the operated patients, 6% mortality was present, with associated comorbid illness, delay in presentation, and amount of peritoneal contamination all being significantly present in these patients.^[9]

CONCLUSION

Perforation of the duodenal ulcer is more likely in people over the age of 40. Male patients make up the majority of the patients. Smoking, alcohol consumption, and a history of automated peritoneal dialysis are all risk factors. The morbidity rate is 8%, and wound infection is common. Patients with comorbid illnesses have a much higher mortality and morbidity rate. Age, concomitant illnesses, the duration of symptoms, and the clinical status at the time of presentation all play a role in post-operative morbidity and death. Prognostic signs can help in duodenal ulcer risk categorization. The usage of this approach can aid in identifying high-risk patients and determining the need for early intervention and therapy in order to improve the patient's outcome.

REFERENCES

- Graham DY. History of *Helicobacter pylori*, duodenal ulcer, gastric ulcer and gastric cancer. *World J Gastroenterol* 2014;20:5191.
- Smith A, Contreras C, Ko KH, Chow J, Dong X, Tuo B, *et al.* Gender-specific protection of estrogen against gastric acid-induced duodenal injury: Stimulation of duodenal mucosal bicarbonate secretion. *Endocrinology* 2008;149:4554-66.
- Chung KT, Shelat VG. Perforated peptic ulcer-an update. *World J Gastrointest Surg* 2017;9:1-12.
- Hassan M. Postoperative outcome of duodenal ulcer (DU) perforation in Rajshahi medical college hospital: A study of 300 cases. *Sch J App Med Sci* 2021;1:86-91.
- Thomopoulos KC, Vagenas KA, Vagianos CE, Margaritis VG, Blikas AP, Katsakoulis EC, *et al.* Changes in aetiology and clinical outcome of acute upper gastrointestinal bleeding during the last 15 years. *Eur J Gastroenterol Hepatol* 2004;16:177-82.
- Gupta S, Kaushik R, Sharma R, Attri A. The management of large perforations of duodenal ulcers. *BMC Surg* 2005;5:1-5.
- Kolandasamy C. Non Traumatic Hollow Viscus Perforation of the Gastro Intestinal Tract: A Comprehensive Analysis (Doctoral dissertation, Stanley Medical College, Chennai); 2006.
- Durai R, Razvi A, Uzkalnis A, Ng PC. Duodenal ulcer perforation: A district hospital experience. *Acta Chirurg Belgica* 2011;111:23-5.
- Arumugam SS, Parthiban G, Ramprasad A, Anandan H. A study of duodenal ulcer perforation post-operative outcome in a tertiary center. *Int J Sci Stud* 2018;6:38-41.
- Nuhu A, Madziga AG, Gali BM. Acute perforated duodenal ulcer in Maiduguri: Experience with simple closure and *Helicobacter pylori* eradication. *West Afr J Med* 2009;28:384-7.
- Gavit SM, Ahirrao BM. A study of risk factors, early evaluation and management of duodenal ulcer perforation peritonitis. *Galore Int J Health Sci Res* 2020;5:66-76.

12. Møller MH, Adamsen S, Thomsen RW, Møller AM. Preoperative prognostic factors for mortality in peptic ulcer perforation: A systematic review. *Scand J Gastroenterol* 2010;45:785-805.
13. Bupicha JA, Gebresellassie HW, Alemayehu A. Pattern and outcome of perforated peptic ulcer disease patient in four teaching hospitals in Addis Ababa, Ethiopia: A prospective cohort multicenter study. *BMC Surg* 2020;20:1-8.
14. Chalya PL, Mabula JB, Koy M, Mchembe MD, Jaka HM, Kabangila R, *et al.* Clinical profile and outcome of surgical treatment of perforated peptic ulcers in Northwestern Tanzania: A tertiary hospital experience. *World J Emerg Surg* 2011;6:1.

How to cite this article: Gnanakkumar T. Study of Duodenal Ulcer Perforation Post-Operative Outcome. *Int J Sci Stud* 2021;9(6):113-117.

Source of Support: Nil, **Conflicts of Interest:** None declared.