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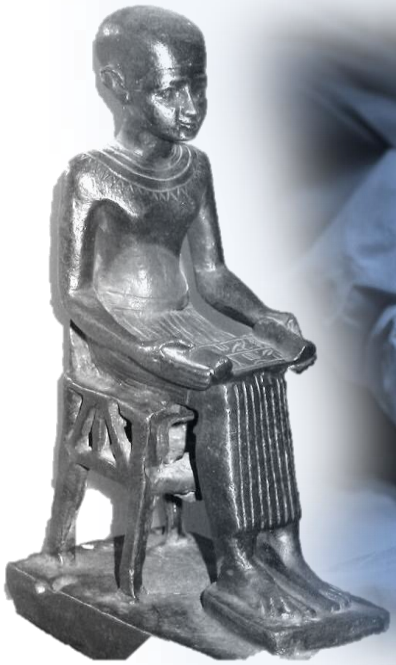

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Original Article

Clinical Outcome and Factors Related in Patients with Perforated Peptic Ulcer at a South Indian Tertiary Care Hospital

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Abstract

Background: Significant morbidity and mortality are linked to perforated peptic ulcers [PPU], especially in low- to middle-income nations. The purpose of this study was to examine the clinical outcome of PPU patients and identify factors that could be altered to enhance outcomes.

Methods: A retrospective analysis was conducted on the hospital's case sheet database in Medical Records department [MRD] after getting approval from Ethics committee. The cohort for analysis consisted of all patients at our hospital who received a PPU diagnosis between January 2023 and November 2024. The variables collected include age, comorbid profile, Boey score, type of surgery performed and complications. The study comprised patients with a confirmed single diagnosis of perforated peptic ulcer disease who were 13 years of age or older.

Results: A total of 182 patients were part of the cohort. The mean age was 45 years, and the male to female ratio was 5:1. The most prevalent comorbidity was hypertension, and the only known risk factor for PUD was non-steroidal anti-inflammatory drugs. Pre-pyloric ulcers were most common in 60.4% of the study participants, followed by duodenal ulcers in 23.07% and stomach ulcers in 16.4%. In 82.6% of patients who had surgical treatment, omental patch repair was the most frequent operative procedure, followed by primary closure in 17.4%. Eighty percent of the patients in this study who did not need relaparotomy underwent an omental patch during their index procedure, while twenty percent underwent primary closure and debridement. None of the patients had a Boey score of 0.

Conclusion: The Boey score was a strong predictor of both death and leak rate in our PPU patients. Although adding age as a variable could aid in mortality prediction in our context, more study is required to completely comprehend the clinical implications.

Keywords: Peptic Ulcer; NSAIDs; Prediction; Hypertension; Boey score.

INTRODUCTION

Gastrointestinal ulcers, primarily in the stomach and duodenum, are referred to as peptic ulcer disease [PUD]. It is distinguished by excessive acidity, which causes mucosal erosions that are extremely painful and uncomfortable. PUD is an endoscopic diagnosis since mucosal erosions must, by definition, be greater than 3 to 5 mm and evident down to the submucosa [1].

It results from an imbalance between mucosal defences that prevent acid digestion and acid-pepsin release. About 8.09 million people worldwide suffered with PUD in 2019 [2].

About 5 million adults in the US suffer with PUD each year, and there are 500,000 new cases and 4 million recurrences recorded annually. PUD patients might have a wide range of clinical outcomes, from a quick recovery with medication to those who experience bleeding, perforation, or obstruction of the gastric outlet [3,4].

One of the most dangerous side effects of PUD, perforation is when all of the digestive tract's layers are broken and can result in significant morbidity and even death [5].

Patients with perforated peptic ulcers [PPU] are known to have a poorer prognosis if they are older, have substantial comorbidities, or present later [6,7].

This is particularly crippling for nations with limited resources **[7,8].** Information regarding the clinical course and results of PPU illness patients is scarce, particularly in low- and middle-income [LMIC] nations **[9].**

The most popular scoring methods for forecasting the progression of PPU disease are the Boey score, peptic ulcer perforation score [PULP], and American Society of Anaesthesiologists [ASA] score [10].

Despite its high mortality predictions [11], the PULP score is complex and impractical in a therapeutic setting. The ASA score's subjective nature further limits its relevance to PPU [12].

The Boy score is now one of the most widely used scoring systems for PPU result prediction due to its exceptional accuracy and relative ease of use [13,14]. Hence our study intends to characterize the course of therapy followed by patients with perforated PUD and identify the elements that lead to poor outcomes.

METHODS

A retrospective analysis was conducted on the hospital's case sheet database in Medical Records department [MRD] after getting approval from Ethics committee [IEC/56/2022]. The cohort for analysis consisted of all patients at our hospital who received a PPU diagnosis between January 2023 and November 2024.

The study comprised patients with a confirmed single diagnosis of perforated peptic ulcer disease who were 13 years of age or older. Patient demographics, clinical presentation, medical comorbidities, Boey score, management, and outcome were among the information gathered. In-hospital mortality, leak rate, necessity for relaparotomy, and intensive care unit stay were among the outcome factors gathered. Hypertension, diabetes mellitus, HIV infection status, and coronary artery disease were among the comorbidities that were recorded. Because of its link to PUD, the usage of non-steroidal anti-inflammatory medicines was added as a comorbidity.

Three criteria were used to generate the Boey score: the presence of a major comorbidity, a systolic blood pressure reading below 100 mmHg, and a delayed presentation of more than 24 hours. Each of the three variables that were present earned the patient one point; the lowest possible score was zero, and the highest was three [13].

Omental patch repair, debridement with primary repair, partial gastrectomy, and t-tube repair were among the procedures carried out. A midline laparotomy incision was used for all procedures. Whether the original repair was intact or leaking was noted for patients who had re-laparotomies. Clinical results and imaging, such as CT scans or contrast feeds, which confirmed a confined leak, were the basis for the choice to treat patients non-operatively. Once they could tolerate a full ward meal and the stomach pain had subsided, they were released from the hospital after receiving conservative management with Helicobacter pylori eradication therapy.

Based on the anatomical description of the ulcer's position as provided in the operating notes, the location of the ulcer was classified into three groups. This encompassed duodenum, prepyloric, and gastric. Any ulcers in the stomach's fundus, body, or antrum were considered gastric ulcers. All ulcers discovered within 5 cm of the pylorus were classified as prepyloric ulcers, and all ulcers discovered farther away from the pylorus up to the fourth segment of the duodenum were classified as duodenal ulcers. The days from admission to discharge were used to represent the length of hospital stay.

The clinical features were displayed using both descriptive and graphical statistics. To ascertain whether or not a distribution was normal, the Kolmogorov-Smirnov test was employed. We looked for significant variations in the features of patients with PPU prevalence using the Mann-Whitney U test.

RESULTS

A total of 182 patients were part of the cohort. The mean age was 45 years, and the male to female ratio was 5:1. The most prevalent comorbidity was hypertension, and the only known risk factor for PUD was non-steroidal anti-inflammatory drugs [NSAIDs]. Nine people who passed away had hypertension as a risk factor and hypertensive disease alone as a comorbidity; the other comorbidities, most frequently diabetes, were linked to the other individuals. NSAID use was the sole risk factor for PPU illness in one of the patients who passed away. Three patients who passed away had a history of coronary artery disease, while another had a history of hypertension and renal failure. The cohort's demographics, comorbidities, and fatalities are displayed in **Table [1]**.

Pre-pyloric ulcers were most common in 60.4% of the study participants, followed by duodenal ulcers in 23.07% and stomach ulcers in 16.4%. In 82.6% of patients who had surgical treatment, omental patch repair was the most frequent operative procedure, followed by primary closure in 17.4%. One patient had a t-tube repair, while two patients had partial gastrectomy.

Eighty percent of the patients in this study who did not need relaparotomy underwent an omental patch during their index procedure, while twenty percent underwent primary closure and debridement. The type of repair done and the outcome of the operation did not significantly correlate. None of the patients had a Boey score of 0. [**Table 2**]

Table [1]: Demographics and comorbidities

Parameter		Values	Death
Age	**Mean±SD**	43±16.2	-
Gender (n,%)	Male	141 (77.4%)	17
	Female	41 (22.6%)	9
Comorbidities	None	117 (64.2%)	11
	Hypertension	34 (18.6%)	9
	Diabetes	19 (10.4%)	1
	Cardiac	5 (2.7%)	3
	Pulmonary	3 (1.6%)	1
	Renal	2 (1.09%)	1
	Other	1 (0.54%)	1
	NSAIDs use	15 (8.2%)	1

Table [2]: Operative findings, Boey score and outcome

Variable		n	%
Ulcer location	Prepyloric	110	60.4
	Duodenal	42	23.07
	Gastric	30	16.4
Boey score	1	102	56.4
	2	56	30.7
	3	24	13.1
Outcome	Survived	146	80.21
	Died	36	19.79

DISCUSSION

In this study, we found that the Boey score, age, female gender and requirement for relaparotomy all significantly raised the risk of in-hospital death in PPU patients. The research population's 12% death rate was greater than the 10% documented in the global literature [15,16].

The majority of the patients had a Boey score of 1, and none had a score of 0, which may help to explain this. On the other hand, the majority of patients present with a Boey score of 0. This is supported by statistics from worldwide literature. The demographic character of foreign cohorts is reflected in the male-to-female ratio of 5:1 and the mean age of 45.6. The following factors cannot be changed: female gender, white race group, age over forty, and the requirement for relaparotomy. According to other research, there is a correlation between growing older and mortality [17].

Data from international literature have not confirmed the higher risk linked to feminine gender [18].

The sole independent predictor of a leak was the Boey score. Patients who experienced a leak had an average Boey score of 2, which may be related to the fact that every criterion in the score either reflects or promotes physiological disruption that may be a factor in poor recovery.

A study by **Gbenga *et al.*** [19] perforated PUD accounts for high morbidities and mortalities in our setting. Abuse of NSAIDs and herbal concoction ranked highest among the risk factors.

Because the surrounding tissue was too brittle for primary closure, the omental patch was the most often used surgical approach for the surgical management of the patients in this study population. The operating surgeon determined that two of the patients needed gastrectomy since they had extensive ulcers with surrounding friable tissue and no appropriate omentum for patch healing.

At relaparotomy, one was discovered to have an anastomotic leak, and the other passed away prior to the procedure. It was

discovered that the patient who underwent a t-tube repair had a duodenal ulcer encircled by friable tissue and no viable omentum for a patch. The t-tube was taken out a few days later, and the patient was sent home in stable health without ever needing a relaparotomy. These figures were insufficient to make any meaningful inferences regarding t-tube repair or gastrectomy for PPU.

Our study's primary **limitation** was its dependence on the attending physicians to thoroughly interview and record the pertinent medical history and risk variables related to PPU at the time of admission. Since many people still have trouble telling the difference between duodenal and pre-pyloric ulcers, this was especially important when the location of the ulcer was mentioned after surgery. Therefore, we were unable to assess whether or not the repair was intact in those patients who did not have relaparotomy. Since this was a retrospective study, this was unavoidable.

Conclusion: Our results suggest that when risk stratifying patients with PPU at admission, doctors should think about changing the Boey score to include age more than forty. The effect of gender on mortality has to be further studied. There was a substantial correlation between a leaking fix and a Boey score greater than 1. For patients who have been carefully chosen, non-operative management is still an option. The most popular management approach in our context for PPU is omental patch repair, which is a safe and efficient surgical technique.

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Conflicts of Interest: There are no conflicts of interest

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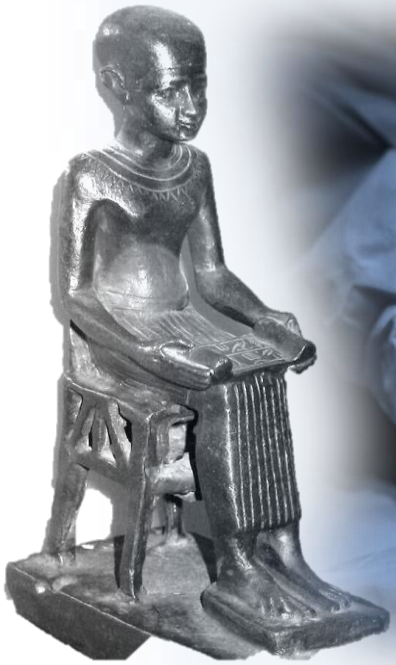

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