

## Factors predicting the outcome of patients in peptic ulcer perforation.

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### Abstract:

**Background:** Peptic ulcer perforation is a major surgical problem. There are many risk factors that influence morbidity and mortality in perforated peptic ulcer disease. The aim of our study was to determine relations between postoperative morbidity and perioperative risk factors in perforated peptic ulcer.

**Materials and Methods:** : In total, 100 patients who underwent emergency surgery for perforated peptic ulcer in Mysore medical college, General Surgery Department, between June 2018 and June 2019 were included in this study. The clinical Data regarding age, gender, complaints, time elapsed between onset of symptoms and hospital admission, physical examination findings, co-morbid diseases, laboratory and imaging findings, operative methods, post operative complications, length of hospital stay ,morbidity and mortality were collected retrospectively.

**Results:** The study group included 72 (72%) male and 28 (28%) female patients. The mean age was 60 years. Forty patients (40%) had at least one co-morbid disease. In the postoperative period, 38 patients (38%) had complications. The most common complication was wound infection. Mortality was observed in 27 patients (27%). The most common cause of mortality was sepsis. In our study age over 60 years, presence of co-morbidities and late time at presentation, shock at presentation were noted as independent risk factors for morbidity and mortality.

**Conclusion:** Early diagnosis, prompt resuscitation and urgent surgical intervention are essential to improve outcomes. Exploratory laparotomy and omental patch repair remains the gold standard treatment

**Key Word:** Pepticulcer perforation, morbidity, mortality, risk factors, time to admission.

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### I. Introduction

Peptic ulcer disease (PUD) occurs due to an imbalance between stomach acid-pepsin and mucosal defense mechanisms. It affects 4 million people worldwide annually<sup>[1]</sup>. About 10%-20% of patients with PUD will have complications and 2%-14% of the ulcers will perforate causing an acute illness<sup>[4,5]</sup>. Perforation is a serious complication of PUD and patients with perforated peptic ulcer (PPU) often present with acute abdomen that carries high risk for morbidity and mortality<sup>[6]</sup>. The lifetime prevalence of perforation in patients with PUD is about 5%<sup>[2]</sup>. PPU carries a mortality ranging from 1.3% to 20%<sup>[8-10]</sup>. Thirty-day mortality rate reaching 20% and 90-d mortality rate of up to 30% have been reported<sup>[11,12]</sup>. In this study, determine relations between postoperative morbidity and perioperative risk factors in perforated peptic ulcer.

### II. Material And Methods

The files of 100 patients, who were clinically diagnosed with PPU and underwent emergency surgery that is primary closure + omentoplasty operated at Mysore medical college , General Surgery department , were retrospectively examined after the obtainment of written consent from patients regarding the usage of data in medical research and approval from Ethics Committee, mysore medical college and research institute. The patients who underwent different surgical procedures or had malignant ulcer perforations, Giant perforations, primary peritonitis of other causes as corrosive acid perforation, associated traumatic injury to other organs were excluded from the study. The time to presentation was considered to be the time elapsing between the onset of symptoms and presentation to the hospital. The diagnosis of Peptic ulcer perforation was made based on history, physical examination, routine laboratory studies and radiologic imaging.

The following parameters were noted in each patient,

- 1.age
- 2.sex
- 3.time elapsed between onset of symptoms and presentation

4. symptoms at presentation
5. physical examination findings
6. Co-morbid diseases
7. vital parameters- which included pulse rate, blood pressure, respiratory rate, hydration status
8. organ failure
9. imaging studies
10. lab parameters
11. operative method and findings
12. post operative complications
13. length of hospital stay
14. morbidity and mortality

Organ failure was defined as, \*Renal failure: creatinin level >177 µmol/L or urea level >67 mmol/L or oliguria <20 mL/hour. Pulmonary failure: PO<sub>2</sub> <50 mm-Hg or PCO<sub>2</sub> >50 mm-Hg. Intestinal obstruction: paralysis >24 hours or complete mechanical obstruction. Shock: hypodynamic or hyperdynamic<sup>(2)</sup>

Preoperative shock was defined as a systolic blood pressure below 90 mm-Hg

Mortality was defined as death during the hospital stay.

Morbidity was assessed in terms of

1. Length of hospital stay
2. Post-operative complications
  - Burst abdomen
  - Surgical site infection
  - Leak at the repaired site
  - Pulmonary complications pneumonia, atelectasis, pleural effusion.
  - sepsis
  - UTI
  - renal failure

All patients were kept nil by mouth after diagnosis and NG tube and urinary Foleys catheter were inserted. After Adequate fluid resuscitation and pre operative . Ceftriaxone 1 g and metronidazole 500 mg IV injections patients were taken for emergency open laparotomy with primary closure of perforation with omental patch repair with aspiration of the free gastrointestinal content in the abdomen, irrigation using at least 1000 cc normal saline 0.9% with drain placed in Morrison pouch in all the patients and in the pelvic site if necessary. Their nasogastric tubes were withdrawn on post-operative days 3-4. On post-operative day 4, the patients were started on liquid diet. Post-operative antibiotic treatment was maintained for 7-10 days.

**Study Design:** Retrospective study

**Study Location:** This was a tertiary care teaching hospital based study done in Department of General Surgery, at Mysore medical college and research institute, Mysore.

**Study Duration:** between June 2018 and June 2019

**Sample size:** 100 patients.

**Inclusion criteria :** Patients >18 years of age admitted to the Surgical ICU with critical illness.

**Exclusion criteria:**

- Patient with known history of thyroid disorders
- Patient with intake of drugs altering thyroid hormone levels
- Pregnant patients

### III. Result

72 (72%) of the patients were male and 28 (28%) were female patients and the mean age was 60 years. The mean time for presentation to the hospital was 32 hours. While 24 (24%) of the patients had shock at presentation, 40 of them (40%) were identified to have at least one comorbid disease. It was identified that perforation was most frequent in the pre-pyloric region (72 patients, 72%). The length of hospital stay was longer in patients who developed morbidities.

**Table 1:** The demographic and characteristic clinical findings of the patients are indicated

1.age	60 years
2.sex	
Male	72(72%)
female	28(28%)
3.time elapsed between onset of symptoms and presentation	32 hours
4.symptoms at presentation	
Abdominal pain	100(100%)

Nausea-vomiting	92(92%)
5.physical examination findings	
Tenderness	100(100%)
Guarding	96(96%)
Rebound tenderness	96(96%)
6.Co-morbid diseases,n (%)	
Cardiovascular disease	10(10%)
Pulmonary disease	8(8%)
Diabetes mellitus	12(12%)
Urinary system disease	4(4%)
Malignancy	0(0%)
Other	6(6%)
7.signs of shock, n (%)	8(8%)
8.organ failure	1(1%)
9.imaging studies,Free air on AXR, n (%)	98(98%)
10. perforation sites	
Pre pyloric	72(72%)
gastric	28(28%)
11.length of hospital stay	10±4 days
12.morbidity	38(38%)
13.mortality	27(27%)

AXR: upright abdominal X-ray;

In the post-operative period, 38 patients (38%) developed morbidity. The most frequent morbidity was wound infection. 27 (27%) patients died. The most frequent reason for mortality was sepsis.

**Table 2:** The reasons for morbidity and mortality in the post-operative period are shown.

Morbidity and mortality causes	
Morbidity, n (%)	Total 38 (38%)
Wound infection	15 (39.4)
Pleural effusion	9 (23.6)
Atelectasis	5 (13.1)
Pneumonia	4 (10.5)
Acute renal failure	3 (7.8)
Fistula	1 (2.6)
Urinary tract infection	1 (2.6)
Mortality, n (%)	Total 27 (27%)
Sepsis	20 (74%)
Myocardial infarction	1 (3.7%)
Pulmonary etiology	6 (22.2%)

In our study age over 60 years, presence of co-morbidities , late time at presentation of more than 24 hrs from the onset of symptoms , shock at presentation were noted as independent risk factors influencing morbidity and mortality.

#### IV. Discussion

Gastroduodenal peptic ulcer disease (PUD) is a common problem with significant geographic variation in prevalence. In Western countries, the incidence of PUD has steadily declined and the prevalence is much higher in developing countries. Such variations are likely related to the prevalence of *Helicobacter pylori*, smoking, and the use of ulcerogenic drugs, such as nonsteroidal antiinflammatory drugs. The advent of histamine H<sub>2</sub>-receptor antagonists (H<sub>2</sub> blockers) in the 1970s and the development of proton pump inhibitors (PPIs) in the late 1980s led to further acid reduction and faster, more efficient healing of active ulcer disease. PUD complications include bleeding, perforation, and gastric outlet obstruction. Perforation is the second most common with an annual incidence of 11 operations per 100,000 population. PPU carries a mortality ranging from 1.3% to 20%<sup>[8-10]</sup>. Thirty-day mortality rate reaching 20% and 90-d mortality rate of up to 30% have been reported<sup>[11,12]</sup>.

Most common age at presentation of perforated peptic ulcer is 4<sup>th</sup> and 5<sup>th</sup> decades and incidence among males is more than in females 9 ratio of MALE :FEMALE is 2-8:1 in literatures<sup>(14, 15-18)</sup>. While the mean age of our patients was 60years , the male/female ratio was 2.5:1.

It was reported that free sub-diaphragmatic air was identified in the direct X-ray images of 47.2-80% of patients with PUP<sup>(14, 15,19)</sup>. Parallel with these data, 98% of the patients in our study were identified to have free air in their X-ray images.

The post-operative morbidity rate in peptic ulcer perforation ranges between 21-42%<sup>(14, 20, 21)</sup>. Pulmonary and wound site infections are the most common causes. In our study, the morbidity rate was 38%. Similar to the literatures, our patients were identified to have wound site infections and pulmonary complications as the most common causes. We found in our study that age above 60, presence of a co morbid disease, late time at presentation, shock at presentation were factors that significantly influenced morbidity. Kim et al<sup>(22)</sup> stated that age above 60 and female sex constituted the risk factors that influenced post-operative morbidity. In our study, PUP was often seen among men whereas sex was not a significantly influencing factor for morbidity. In our study, 52% of our patients were above the age of 60.

Many studies have reported that the time to presentation at the hospital being over 24 hours had a significant increase in mortality and morbidity<sup>(14, 16, 18)</sup>. In our study, the average time to presentation was calculated to be 32 hours and similar correlation was identified between the time to presentation and morbidity.

The presence of shock on presentation associated with increasing mortality has been reported in some studies.<sup>(25, 26)</sup> and similar finding was noted in our study.

There are studies indicating that morbidity rates increase depending on the presence of concomitant diseases in patients with peptic ulcer perforation<sup>(14, 22-24)</sup>. Similarly, we identified that our patients who had concomitant diseases had higher morbidity rates.

The post-operative mortality rate in peptic ulcer perforation ranges between 4-30%<sup>(14, 27, 28, 22, 29, 30, 34)</sup>. Mortality has been reported to be due to multiple organ failure and pneumonia. In our study, our mortality rate was 27%. The most frequent reasons for mortality in our patients were sepsis and pulmonary problems. The higher mortality in our local study could be due to older age, concomitant co-morbidity and patients with pre-operative shock. The factors influencing mortality in our patients were as follows: age above 60, time to presentation longer than 24 hours, shock at the time of presentation, co morbid diseases

Arici et al.<sup>(28)</sup> reported that mortality significantly increased in PUP patients above the age of 60. Koçer et al.<sup>(14)</sup> stated that mortality was 1.4% below the age of 65, while it was 37.3% above 65 years of age. In our study, being above the age of 60 was found to have a significant influence on mortality. However, in our study sex did not have any influence on mortality. Parallel with studies indicating that time to presentation longer than 24 hours influenced the development of mortality, we also noted that mortality was significantly increased in patients those patients whose time to presentation was longer than 24 hours<sup>(14, 16, 18)</sup>.

There are publications reporting that the presence of shock at the time of presentation increased mortality, we noted that our patients who had shock on presentation had a significantly increased mortality<sup>(32,33, 14, 18, 31)</sup>. Hence patients presenting with PUP in the presence of a shock, have to be taken into the operating room immediately after the correction of fluid-electrolyte imbalance.

The presence of concomitant diseases in PUP patients influenced mortality rates<sup>(14, 22-24)</sup>. We also found that the presence of a concomitant disease had a significant influence on mortality.

The length of hospital stay following surgery in patients with PUP ranges between 7-12.5 days<sup>(16, 17)</sup>. In our study, the mean length of hospital stay was 10±4 days. Excluding patients who developed mortality from the assessment, length of hospital stay was found to be significantly higher in the group that developed morbidity which could be because of the complications that developed in the post-operative period.

## V. Conclusion

In spite of the developments in peptic ulcer disease treatment, peptic ulcer perforation remains a serious surgical problem. Patients above the age of 60, with a time to presentation longer than 24 hours, presence of shock at the time of presentation and concomitant diseases, are patients at high risk for post-operative morbidity and mortality, close monitoring of which can help reducing mortality and morbidity. . Early diagnosis, prompt resuscitation and urgent surgical intervention are essential to improve outcomes

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