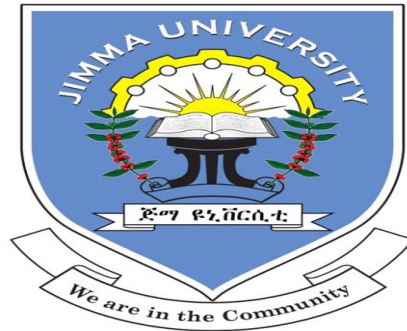


PATTERN OF PRESENTATION AND TREATMENT OUTCOME OF
PERFORATED PEPTIC ULCER DISEASE PATIENTS, AT JIMMA
UNIVERSITY MEDICAL CENTER, JIMMA, ETHIOPIA: A TWO YEAR
RETROSPECTIVE REVIEW



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Pattern of Presentation and Treatment Outcome of Perforated Peptic Ulcer Disease patients, at Jimma University Medical Center, Jimma, Ethiopia.

JANUARY, 2022

Jimma Ethiopia

Declaration

I, the undersigned, declare that this thesis is my original work, has not been presented for a degree, specialty certificate in this or any other university and that all sources of materials used for the thesis have been fully acknowledged.

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This thesis has been submitted for examination with my approval as University advisor

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Abstract

Background: Peptic ulcer perforation is one of the acute complications of peptic ulcer disease with significant morbidity and mortality. It occurs in 2-10% of patients with ulcer disease and its principal treatment is surgical.

Objective: To describe pattern of presentation and treatment outcome of patients operated for perforated peptic ulcer disease from June 1, 2020 to May 30, 2022 at JUMC, Jimma, Ethiopia.

Methodology: The study was retrospective descriptive cross sectional study. SPSS Version 26 used for analysis. The mean, standard deviation (SD), median and ranges were calculated for continuous variables and proportions and frequency tables were used to summarize categorical variables. Multivariate logistic regression was used for the significance of association between the independent and dependent variables in the categorical variables.

Result: Totally, 73 patients were studied. Males were 91.8% with male to female ratio of 11.2:1. The age range is from 15 to 70 years and the peak age of incidence was at the 4th decade. Previous history of dyspepsia was the most common risk factor identified (57.5%). Over 78% of the patients presented after 24 hours of onset of symptoms. Abdominal pain, tenderness and guarding were present in all patients at presentation. Perforations were located on the anterior first part of the duodenum in 74%, making duodenal to gastric perforation 3:1. Size of diameter of the perforation ranges from 3-80mm and is 10 mm or less in 83.6% patients. Repair with omental pedicle flap (Cellan Jones) was done in 87.7% of patients. Post-operative complications were recorded in 33(45.2%) patients and hospital-acquired pneumonia was the commonest. Degree of peritoneal contamination was significantly associated with postoperative morbidity and mortality ($P<0.05$).

Conclusion: In this study the overall morbidity and mortality is found to be high. Repair with omental pedicle flap (Cellan Jones) was the most common repair procedure. In this study degree of peritoneal contamination was significantly associated with postoperative morbidity and mortality.

Recommendation: Prospective research has to be done to accurately assess known risk factors for PPUD. The hospital unit in charge of keeping records needs to pay attention to the alarmingly high number of lost patient charts caused by improper data handling. Awareness creation for nearby health facility staffs on the importance of early referral and health education for the community for early health care seeking behavior needs to be done.

Key words: Perforation, Peptic ulcer disease, Morbidity, Mortality, Pattern

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List of Abbreviations

AKI- Acute Kidney Injury

AIDS- Acquired Immune Deficiency Syndrome

BP-Blood Pressure

H. Pylori-Helicobacter Pylori

ICU-Intensive Care Unit

JUMC- Jimma University Medical Center

NSAID- Non-steroidal Anti-Inflammatory Drug

OR- Operation Room

PPU- Perforated Peptic Ulcer

PR- Pulse Rate

PUD-Peptic Ulcer Disease

SSI- Surgical Site Infection

WBC- White Blood Count

ZES- Zollinger-Ellison Syndrome

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Chapter I

1. Introduction

1.1. Background

Peptic ulcers are localized lesions that extend into the sub-mucosa or deeper in the stomach or duodenal mucosa(1). Each year, 4 million people around the world are impacted. Peptic ulcer disease (PUD) is thought to affect 1.5% to 3% of people(2). Complications affect 10%–20% of PUD patients, and 2%–14% of ulcers perforate, resulting in an acute sickness(3).

A major side effect of PUD is perforation, and patients with PPU frequently have an acute abdomen with a significant risk of morbidity and mortality. The lifetime prevalence of perforation in patients with PUD is about 5%. The mortality rate for PPU ranges from 1.3% to 20%. There have been reports of 30-day mortality rates up to 20% and 90-day mortality rates up to 30%(4).

Symptoms of PUD include abdominal pain, upper abdominal discomfort, bloating and feeling of fullness. Gastric juice and gas enter the peritoneal cavity as PUD progresses and eventually perforates, causing chemical peritonitis. PPU is characterized by the sudden development of abdominal pain or the abrupt worsening of preexisting abdominal discomfort. Usually, despite normal analgesics, the pain never totally goes away, forcing the patient to need medical help. Efflux of gastro-duodenal contents-induced chemical peritonitis and excruciating pain result in tachycardia. PPU is characterized by the triad of abrupt onset of abdominal discomfort, tachycardia, and abdominal rigidity (5).

Three phases can be identified in the clinical presentation. Symptoms including epigastric discomfort, tachycardia, and chilly extremities are typical in the first phase, which begins within 2 hours after start. The second phase (within 2–12 hours) is marked by nonspecific discomfort that gets worse with activity. There may be typical symptoms like abdominal stiffness and right lower quadrant discomfort. Abdominal distension, pyrexia, and hypotension with abrupt circulatory collapse may be visible in the third phase (greater than 12 hours). Early intervention is essential since the likelihood of survival decreases by 2.4% every hour after the onset of symptoms (5).

On an erect chest X-ray, 75% of PPU have open air under the diaphragm. A diagnosis of PPU is made in a patient with upper abdominal symptoms when there is free air on an erect chest X-ray(6). It is advised to get a CT scan since it can rule out acute pancreatitis that doesn't require surgical intervention and has a diagnosis accuracy of up to 98%(5).

Numerous methods of perforation closure (and their variations) were described, including simple closure, closure with a vascularized omental pedicle (Cellon-Jones), and closure with a free omental plug (Graham's). Although its efficacy has not been proven, several facilities still practice placing a sub-hepatic drain following closure. The patient's status at presentation, presenting delay, and surgical intervention are all known to have an impact on the patient's fate(7).

1.2. Statement of problem

Between 10% and 20% of those who have peptic ulcer disease will experience a complication (bleeding, perforation, blockage) during the course of their illness, and when this happens, surgical intervention is frequently needed. PPUD was shown to be the third most common cause of acute abdomen in a study of adult patients at Tikur Anbessa Teaching Hospital in Addis Abeba, Ethiopia. The research's death rate was found to be 28.6%(8).

More than 70% of PUD-related deaths are caused by acute perforations. Despite advancements in perioperative care, the incidence and mortality from perforated peptic ulcer surgery have remained constant or even slightly risen(9).

It is evident from the literature that perforated peptic ulcer patients exhibit variances in age, sex, and presentation patterns, making it challenging to simply apply to our patients the characteristics that have been found as predicting poor prognosis elsewhere. If the goal is to limit morbidity and mortality, PPU needs special attention with timely resuscitation and appropriate surgical care. Most of published literatures at country level were done at capital city of the country which may not reflect socio-demography and risk factors for PPUD in every corner of the country.

1.3. Significance of the Study

PPU is associated with high morbidity and mortality. In our institution at Jimma University medical center, PPU looks common cause of acute surgical abdomen in adult population from monthly operative activity and there is no published study done so far on pattern of patients'

presentation, risk factors and treatment outcome. The result of the study will inform and guide public health authorities/policy makers so that awareness creation on prevention and for early presentation of the patients with clinical condition of PPUD. Study could be also a bench mark for other researchers

Chapter II

2.1. Literature Review

A one-year retrospective analysis of 235 patients at the Tikur Anbessa Teaching Hospital in Addis Abeba, Ethiopia, from January 1 to December 31, 2000, revealed that PPUD was the third most frequently occurring cause of acute abdomen, accounting for 9% of cases(8).

A 51-patient 5-year retrospective observational study on the clinical presentation and surgical management of peptic ulcer perforation in a tertiary hospital in Mogadishu, Somalia, revealed that the study population's age ranged from 18 to 70 years old and had a 7.5:1 male to female ratio. Its incidence was highest in third decade, and symptoms last from one to ten days. In this study, the majority of patients—43.1%—presented between 48 and 72 hours after the onset of symptoms, compared to just 5.8% of patients who did so within 24 hours. Thirteen percent of patients came in more than 5 days after their symptoms first appeared(10).

The most frequent presenting symptoms were sudden start of acute epigastric pain in 82.4% of cases, abdominal tenderness in 41.80% of cases, and vomiting in 60.80% of cases. Twenty nine percent of the total of patients had systolic pressure below 90 mmHg, while 74.5% of patients had clinical sign of peritonitis. Nearly half of the patients had received therapy for dyspepsia in the past; 45.1% had a history of taking painkillers, including non-steroidal anti-inflammatory medications (NSAIDS); and 47.1% had smoked cigarettes in the past. Pleural effusion was the most frequent complication observed in these patients, accounting for 29 (56.9%). Acute renal failure, which affected half of the patients in this study (23), was the second most prevalent event. Nearly one-third (16.4%) of the patients had surgical site infections, but those who sought treatment within 24 hours after developing symptoms were unaffected. In this study, post-operative complications were statistically significantly associated with delayed presentation > 48 hours after the beginning of symptoms ($P < 0.005$). Only two cases of sealed perforation underwent peritoneal lavage, and practically all cases of Graham omental repair were completed. Mortality rate was 7.8% as four patients passed away(10).

A retrospective study on acute peptic ulcer perforations and treatment outcomes at El Obeid Hospital in Western Sudan with 53 patients (50 males, 94.3%; 3 females, 5.7%; male to female ratio, 16.7:1) revealed that 96% of the patients experienced severe epigastric pain, 96%

vomiting, and 96% of them also experienced fever. On examination, 10 patients (18.9%) exhibited acute intestinal obstruction, making up 60.4% of the patients (32 cases) with acute abdomen. Three further patients (5.7%) showed up in shock. Only two (3.8%) of the cases were perforated stomach ulcers, while 96.2% of the cases involved perforated duodenal ulcers. Within the first section, there were two gastric pre-pyloric ulcers and 51 anterior duodenal perforations. One patient had a partial gastrectomy, while the other had a simple stitching procedure to close a gastrointestinal ulcer. The two stomach ulcers were biopsied, but no histological evidence of cancer was seen(11).

The three most common side effects (26.4%) were post-operative fever (12 patients), septicemia (9 patients), and surgical site infection (6 individuals). Four patients (7.6%) who presented after 48 hours had postoperative mortality. They were all older patients, one of whom passed away following a partial gastrectomy leak, and the other three of whom had duodenal perforations arrived in shock(11).

In a retrospective research on the presentation and treatment of PPUD in a tertiary facility in south Nigeria, 28 males and 8 females were evaluated, with a male to female ratio of 3.5:1. Their median age was 42.1 years, with ages ranging from 24 to 65.

The time that symptoms lasted before being reported to the hospital ranged from two hours to six days, with a mean of 3.71.4 days. Within 24 hours of the onset of symptoms, four individuals (11.1%) presented. Twelve (33.3%) patients had taken non-steroidal anti-inflammatory medicines (NSAIDS) for a period of time ranging from 1 to 3 years with an average of 1.7 0.8 years, while twenty-four (55.6%) patients had a history of peptic ulcer disease (PUD) with symptoms lasting from 1 to 8 years on average. The other 4 (11.1%) patients arrived at the hospital for the first time without having previously used NSAIDs or PUD. Severe epigastric pain, vomiting, and abdominal distension were the most frequent presenting symptoms in 36 (100%), 22 (66.7%), and 10 (27.8%) individuals, respectively. Thirty patients (83.3%) had peritonitis symptoms, with eight (22.2%) of them arriving in shock (systolic blood pressure less than 90 mmHg). Plain chest/abdominal radiographs were taken of 18 patients (50%) with free gas under the diaphragm visible in 11 (61.1%) of them(12).

In 104 patients who had surgical intervention for perforated peptic ulcers over a 5-year period at Nigeria's Irrua Specialist Teaching Hospital between April 1, 2010, and March 31, 2015, a prospective study found a male to female ratio of 3.5:1. The gastric to duodenal ulcer ratio was 1.88:1, with 68 (65%) patients having perforated gastric ulcers and 36 (35%) having perforated duodenal ulcers. The age range was between 17 - 95 years. With a standard deviation of 16.1 years, the mean age was 49.99 years. 37.75 years old was the average age for duodenal ulcer perforation (SD 11.08 years). The median age for perforation of a stomach ulcer was 55 years (SD 15.19 years). Only forty-five patients (43.2%) had a history of antiulcer treatment within the six months before to perforation, whereas sixty-two patients (59.6%) had no history of peptic ulcer disease. Patients from lower socioeconomic classes comprised the majority of the population. 41 farmers made up the single-largest group (39.4%), followed by 12 dealers (11.5%), 8 students (7.7%), 6 pastors, and 6 teachers (5.7%). Pain was the most frequent cause of presentation, occurring in every patient, and vomiting was the second most frequent symptom, occurring in 70 (67%) patients. 95 (91%) individuals with plain chest or erect lateral decubitus radiographs had air under the diaphragm(13).

In this study, risk variables were found to include the use of NSAIDs by 39 patients (37.5%), including the youngest patient, ingesting herbal mixtures by 18 patients (17.3%), dry fasting by six patients (5.7%), including four pastors and two women, and smoking by five patients (4.8%)(13).

The number of pyoperitoneum at laparotomy varied from 1 L, 24 (23.1%), between 1 and 2 L, 57 (54.8%), and >2 L, 23 (22.1%). The sizes of perforation ranged in 1 cm, 51 (49%), between 1 and 2 cm, 39 (37.5%), and >2 cm, 14 (13.5%). Graham's omentopexy was the chosen type of repair for 72 (69.2%) patients, while the others had simple edge closure. No patient underwent a definitive antiulcer procedure. There were 9 reoperations, 5 of which were for intraabdominal collections with repair intact and 4 for repair leakage. Any malignancy was not found in any of the samples sent for histology. The mortality rate was 17.3% with 18 deaths, and two of those deaths included reoperations(13).

Forty six patients with intra-operative findings of a perforated peptic ulcer were studied in a five-year prospective study at the Ekiti State University Teaching Hospital (EKSUTH), Ado-Ekiti, Ekiti State, South western Nigeria from June 2015 to May 2020. The patients' ages ranged from

21 to 85 years (mean, 49.9 ± 16.3 years), with the median age being 54 years (IQR 33.3- 60.0). 7 (15.2%) women and 39 men (84.8%) made for a 5.5:1 male to female ratio. At the time of presentation, all of the patients (100%) had abdominal pain that lasted from 6 hours to 9 days (mean, 2.71.9 days), and 10 (21.7%) of the patients also experienced shock. Only 16 (34.8%) individuals had a history of dyspepsia, and only one had endoscopic confirmation of a peptic ulcer and received adequate antiulcer care, while the other six had insufficient care. Ten (21.7%) patients had concurrent medical conditions, including advanced prostate cancer, two cases of alcoholic liver disease, two cases of diabetes mellitus, and three cases of osteoarthritis(14).

Air under the diaphragm was detected by plain chest radiograph in 37 (80.4%) of the patients, and NSAIDs, herbal concoctions (a combination of local gin and palm wine, spices, and bitters), alcohol, smoking, and previous dyspepsia were all potential risk factors for PUD/perforation(14).

The ratio of duodenal to gastric perforation in this study was 1.7:1, with 29 (63%) perforations in the anterior first part of the duodenum and 17 (37%) at the prepyloric region of the stomach. In the female, there was only one stomach perforation. Individuals with perforations of 1 cm, 1-2 cm, and >2 cm were represented by 13 (28.3%), 29, and 4 (8.7%) patients, respectively. Biopsies performed on all patients who had stomach perforations revealed no signs of cancer. Graham's patch technique was used to repair perforations in 27 cases (58.7%), whereas omentoplasty was used to close the remaining cases. Wound infection occurred in 10 (21.7%) participants and was the most frequent consequence. Both pneumonia and an intra-peritoneal abscess occurred in two patients (4.3%) each. The patient who had an intra-peritoneal abscess underwent re-exploration and abscess drainage whereas the other patient passed away. Mortality and postoperative complications are substantially correlated (P 0.0001). For patients without surgical difficulties, the mean hospital stay was 8.8 days; for those with issues, it was 13.6 days (P=0.03). A 17.4% mortality rate was recorded with eight patient deaths. Age 60 years (p = 0.04), premorbid illness (p = 0.01), delayed presentation 48 hours (p = 0.01), shock (p = 0.01), and intra-peritoneal effluent 2000ml (p = 0.03) were linked with mortalities, while presentation duration 48 hours was substantially associated with complications.(14).

28 patients who underwent peptic ulcer perforation surgery at Nairobi's Kenyatta National Hospital (KNH) between January 2005 and December 2005 were retrospectively reviewed. The male to female sex ratio in this study was 8.3:1, and the median age of the patients was 35.4

years, ranging from 11 to 78. The majority of patients (57.1%) were under the age of 35, and vomiting and rapid onset abdominal discomfort were the most frequently reported presenting complaints(15).

The average length of the symptoms was 7.5 days. Three patients (10.7%) had a history of taking NSAIDs on a regular basis, and 11 patients had used alcohol, 11 patients smoked, and 11 patients had experienced dyspepsia in the past. The majority of the perforations were duodenal and anterior. 7 patients (or 25%) experienced complications, which included 3 wound infection instances, 3 re-perforations/leaks, and 1 re-operation for a burst abdomen. Five patients received transfusions of whole blood ranging from two to six units. Out of 28 instances, 4 people died, for a mortality rate of 14.3%. Treatment delay ($p=0.007$) and acute perforation (p) were the factors substantially linked to complications.(15).

A study of 142 patients with perforated peptic ulcer disease treated at the University Teaching Hospital of Kigali (CHUK), Rwanda, between January 2013 and June 2018 revealed a 4 to 1 male to female patient ratio. The majority of patients were between the ages of 20 and 30 (27%) and 31 to 40 (26%), respectively. 84(59%) patients, were under the age of 40. Few patients had co-morbidities, and the average number of days that symptoms lasted before presentation was 4. The number of days that symptoms lasted before presentation ranged from 1 to 7 days. Rarely was hypotension present. Seventy percent of the patients arrived at the hospital within 24 hours after their onset of symptoms (like abdominal pain, fever, nausea and vomiting). Only 29 (20%) patients had a fever when they first arrived, whereas 99 (70%) had tachycardia. Abdominal distention was the most frequent clinical symptom, and all patients demonstrated signs of generalized peritonitis, either rebound or guarding. The study found that 28% of patients died while 48% of patients experienced complications. Sepsis was the most common developed complication (28%) followed by pneumonia (20%), unexpected reoperation (15%), surgical site infection (10%), and DVT/PE (1%) and ICU admission (22%) with a hospital stay duration of 1 to 45 days(16).

The risk of death increased in this study with the occurrence of any post-operative complication ($p0.001$), sepsis ($p0.001$), advanced age (greater than 61) ($p=0.03$), pneumonia ($p=0.007$), unexpected re-operation ($p0.001$), lack of insurance ($p=0.034$), and operator qualification ($p=0.003$). In 27 (19%) cases, consultant surgeons were present in the operating theatre, but

residents operated on 115 (81%) of the patients. Turbid fluid was the most typical intraperitoneal fluid discovered after laparotomy, and pre-pyloric 46 (32%) was the most typical perforation site. For all patients in this investigation, a pedicled omentum was used in a modified Graham's perforation repair(16).

a combined retrospective and prospective analysis of 84 patients who underwent surgery at Bugando Medical Center for perforated peptic ulcers between April 2006 and March 2011; the male to female ratio was 1.3:1. Their modal age range was between 21 and 30, and their median age was 28. The average length of the illness was 5.8 days. 69.0% of the patients had never previously received treatment for peptic ulcer disease. Alcohol consumption, non-steroidal anti-inflammatory drug use, and smoking were all reported by 10.7%, 85.7%, and 64.3% of people, respectively. Eight (9.5%) patients were HIV positive with a median CD4 count of 220 cells/ μ l. The duodenum accounted for the majority of perforations were found (90.4%), and the ratio of duodenal to stomach ulcers was 12.7:1. In 83.3% of instances, Graham's omentopexy was used to repair the perforations. The incidence of complications and mortality were, 29.8% and 10.7% respectively. Premorbid disease, HIV status, CD 4 count below 200 cells/l, treatment delay, and acute perforations were the factors substantially associated with complications (P 0.001). The mortality rate was higher in patients with age >40 years, delayed presentation (>24 hrs), shock at admission (systolic BP 90 mmHg), HIV positivity, low CD4 count (200 cells/l), gastric ulcers, complications, and presence of comorbidities (P 0.001).The median overall length of hospital stay was 14 days(17).

A retrospective cross sectional study on 101 patients on Outcome and Associated Factors in Dessie Referral Hospital, Ethiopia over three years from June 1/ 2016 - May 30/2019 G.C depicted most perforations were located on the first part of duodenum 93 (92.1%). Graham's omental patch was the most common surgical managements of the perforations. Complications such as superficial surgical site infection (11.9%), wound dehiscence (6.9%), respiratory infections (14.9%), postoperative collections (7.9%), acute kidney injury (5%) and ECF (1%) were identified. A perforated peptic ulcer post-operative complications were substantially correlated with comorbidity, SBP > 90 mmH, and age > 50(18).

Between June 1, 2013, and June 30, 2016, 87 patients who underwent acute perforated peptic ulcer surgery at the Minilik II Memorial Referral Hospital in Ethiopia were the subject of a

retrospective analysis and they were 75 male and 12 female patients. Their mean age was 33.4 years, and their ages ranged from 23 to 74. 38 people (43.6%) out of the total were in the 31–40 age range. In 37 (43.0%), there was previous history of treatment for dyspepsia and or PUD while History of use of Chat and Cigarettes were reported in 44 (50.5%) and 41 (47.1%) of patients respectively during the illness(9).

This study found a substantial seasonal predisposition in the frequency of perforated peptic ulcer disease, with 39 (44.8%) of the patients undergoing surgery between July and September, which is the Ethiopian rainy season which was found to be statistically significant ($P < 0.05$). Only 9 people (10.3%) had symptoms that lasted fewer than six hours at the time of presentation. The most frequent presenting symptoms were nausea/vomiting in 79 (90.8%) of the patients and abrupt onset of epigastric pain that became very severe in 83 (95.5%) of the patients. Sixteen patients (18.3%) presented in hypotensive state. Plain abdominal x-ray was done in 53 patients and showed air under the diaphragm in 39 (75%) of the patients(9).

In 77 (88.7%) of the patients, intra-operative findings revealed perforation of the anterior side of the first segment of the duodenum, with the perforations averaging 0.5 cm in width in 69 (89.6%) of the cases. In 10(11.3%), the distal stomach was perforated. More than 1000ml of intraperitoneal gastric content combined with pus were found in 78 (90.7%) patients(9).

All patients had surgical management, and 83 (95.4%) of them underwent pedicled omental patch repair after Cellan-Jones. After collecting a biopsy from the ulcer margin, four patients (4.5%), all of whom had stomach perforations, were managed without the use of an omental patch. Based on the intraoperative observations, malignant gastric ulcer was strongly suspected; however, only one of them was histopathologically proved to be an adenocarcinoma(9).

Twenty (22.9%) of the patients experienced a total of 42 sequelae, with wound infection accounting for the majority (15.8%) of these cases. Ten of the patients (11.4%) required relaparotomies, and four (4.5%) required two re-laparotomies: Reoperation was necessary due to intraperitoneal collection without patch failure in 4 (4.6%) cases and failed omental patch in 6 (6.8%). All six patch failures received peritoneal lavage, pedicled omental repatching of the perforated location with an extra vagotomy, and gastro-jejunostomy during the initial re-

laparotomy. In 4 (75%) of these patients, the re-patch failed. As a result, one of these patients had a second re-laparotomy and re-patch, and three other patients required a jejunoserosal patch repair treatment. Eight patients (10.3%) died from duodenal and one from stomach perforation, respectively. Eight patients died from septic shock and multiple organ failure (3 following the first patch surgery, 1 following the first re-patch surgery, 1 following the second re-patch surgery, 1 following the jejuna-serosal patch, and 2 following re-laparotomy for recollection), and one patient died from fulminant hepatic failure in the context of chronic liver disease. The mean and median post-operative stays were 8.4 and 17.2 days, respectively. Post-operative hospital stays ranged from 1 to 56 days(9).

In a prospective cohort study of 97 patients who underwent surgery for perforated peptic ulcer disease between June 1, 2018, and May 31, 2019, in four teaching hospitals connected to the Department of Surgery of the School of Medicine, College of Health Science, Addis Ababa University, it was discovered that there were 6.5 times as many men as women among the patients, and that their ages ranged from 16 to 76, with a mean of 31.9 and a median of 27. 15 people, or 15.5%, came from outside the city. Muslim 16.5% and orthodox Christian 77.3% respectively. 44 (45.4%) of all patients reported regularly consuming alcohol, and 33% reported smoking. 17 (17.5%) of the patients used the addictive native stimulant khat (*Catha edulis*). Even though 73 (75.3%) individuals reported having PUD, 90 (92.8%) had *Helicobacter Pylori* at the time of presentation. Thirteen (13.4%) individuals experienced perforation during fasting(19).

44 (45.4%) of the patients showed up within 24 hours, and 33 did so between 24 and 48 hours after the starting of their abdomen pain. All patients presented with abdominal pain, and 85 (87.6%) of those who underwent physical examination had generalised peritonitis. Hypotension was present in 17 (17.5%), while elevated WBC count was seen in 45 (46.4%). 83 of the 97 (85.6%) patients had X-ray evidence of free peritoneal air(19).

In 91 (93.8%) cases, the perforation was found anteriorly in the first part of the duodenum, and in 79 (81.3%) cases, its diameter was smaller than 10 mm. In 72 (74.2%) of the patients, the peritoneal GI content was less than one liter. 65 (67.1%) patients had their omental patch repaired using a vascularized patch, while 28 (28.8%) patients used a free patch(19).

16 (16.5%) of the patients experienced serious problems, including surgical site infection, pneumonia, post-operative collection, and patch failure. 94 (96.6%) patients were discharged feeling better, while 3 (3.1%) passed away. 53 patients, or 54.6%, were discharged in less than 7 days. Higher age (> 40 years), longer time at presentation (> 48 h), hypotension at presentation, and higher degree of peritoneal contamination were significant risk indicators (P 0.05) in terms of morbidity and mortality(19).

136 patients who underwent surgery between January 2013 and December 2017 were included in a retrospective review conducted at Saint Paul's Hospital Millennium Medical College (SPHMMC), Addis Ababa, Ethiopia, to determine patient presentation, management, and postoperative complications of perforated peptic ulcer disease (PPUD). The male to female ratio in this study was 5.5:1. The patients' mean and median ages were 36.05 and 30 years, respectively. The peak incidence was between 15 and 30 years. 105 patients, or 77.2%, of the total, were under the age of 45. The majority of the patients (50.7%) were from cities(4).

Eighty-two (60.0%) of the patients had a history of dyspepsia or PUD treatment. Of the 51 records in the file, 24 patients (47.05%) disclosed a history of recent alcohol consumption. Comorbid conditions included diabetes mellitus, bronchial asthma, chronic liver disease, congestive heart failure, and retrovirus infection in five (3.7%) of the patients (RVI)(4).

A total of 52.2% of patients arrived within 24 hours after the commencement of their symptoms, with symptom duration ranging from 1 to 8 days. 13% of the patients had systolic blood pressure that was higher than 90 mmHg, and all of the patients had quick start of severe stomach discomfort, nausea, and vomiting. All of the patients with systolic blood pressure under 90 mmHg arrived within 24 hours of the onset of symptoms. All of the patients had palpable abdominal soreness. WBC count was normal in 67 patients (49.3%), although leukocytosis was present in 5 patients (40.3%). The initial segment of the duodenum had the most perforations (121, 89%), and the ratio of duodenal to gastric perforations was 8.1:1. The ulcers were 5 mm in size on average. Eighty-eight percent (64.7%), or 5 mm, and eight percent, or >10 mm, or 35 percent, of the perforations were between 5 and 10 mm. The average and median peritoneal fluid volumes were 1293 and 1000 milliliters, respectively, with a range of 100 to 6000 milliliters. 126 of the patients, or 92.6%, had Graham's omental patch. Duodenal perforations spontaneously closed in four patients. The remaining two patients had simple closure of the perforation,

whereas the remaining four patients with gastric ulcers underwent simple closure with gastro-jejunostomy. For 84 patients (61.8%), sub-hepatic drains were kept(4).

The most frequent postoperative complication was superficial surgical site infection (20, 27.4%). Acute renal injury (7, 9.7%), wound dehiscence (10, 13.7%), hospital-acquired pneumonia (16, 21.9%), postoperative collections (12, 16.4%), and repair site failure (8, 10.9%) were the other complications. Postoperative morbidity was strongly correlated with old age, being female, comorbidity, hypotension, tachycardia, and delayed presentation (P 0.05). The mean age of patients who experienced complications was 40.18 17 years, compared to 34.7 16.2 years for patients who did not (P=0.25). Only 9% of patients who presented within the first 24 hours of their illness experienced postoperative complications, compared to 35% of those who presented beyond that time (P=0.000). When compared to those without hypotension, only 19% suffered complications, while 44% of those with hypotension did (P=0.019). Four of the five comorbidly sick patients experienced surgical complications (P=0.001)(4).

Nine patients among all (6.6%) passed away at the hospital after surgery. The leading cause of death (88.9%) was severe sepsis related to multiple organ failure. Mortality was strongly correlated with advanced age, concomitant disease, tachycardia, and the occurrence of postoperative sequelae. The mortality group had a higher mean age (52 14.2 years) than the survivors (mean 34.9 16 years). Patients who died had considerably older average ages (P=0.04). Three patients (33.3%) with comorbidities were among the nine patients who passed away after surgery (P = 0.001). All patients who passed away (88.9%) had surgical complications except for one (P = 0.001). Although there was no statistically significant association between late presentation (>24hrs) and mortality (P=0.36), 66.6% of reported deaths patients who presented 24 hours after the onset of symptoms. There is no statistically significant correlation between mortality and hypotension or the magnitude of the perforation. Except for superficial surgical site infections, all complications had a big impact on mortality. The postoperative hospital stay for those who had complications was 18.6 14.7 days, which is significantly longer than patients who did not develop complications(4).

Conceptual Framework

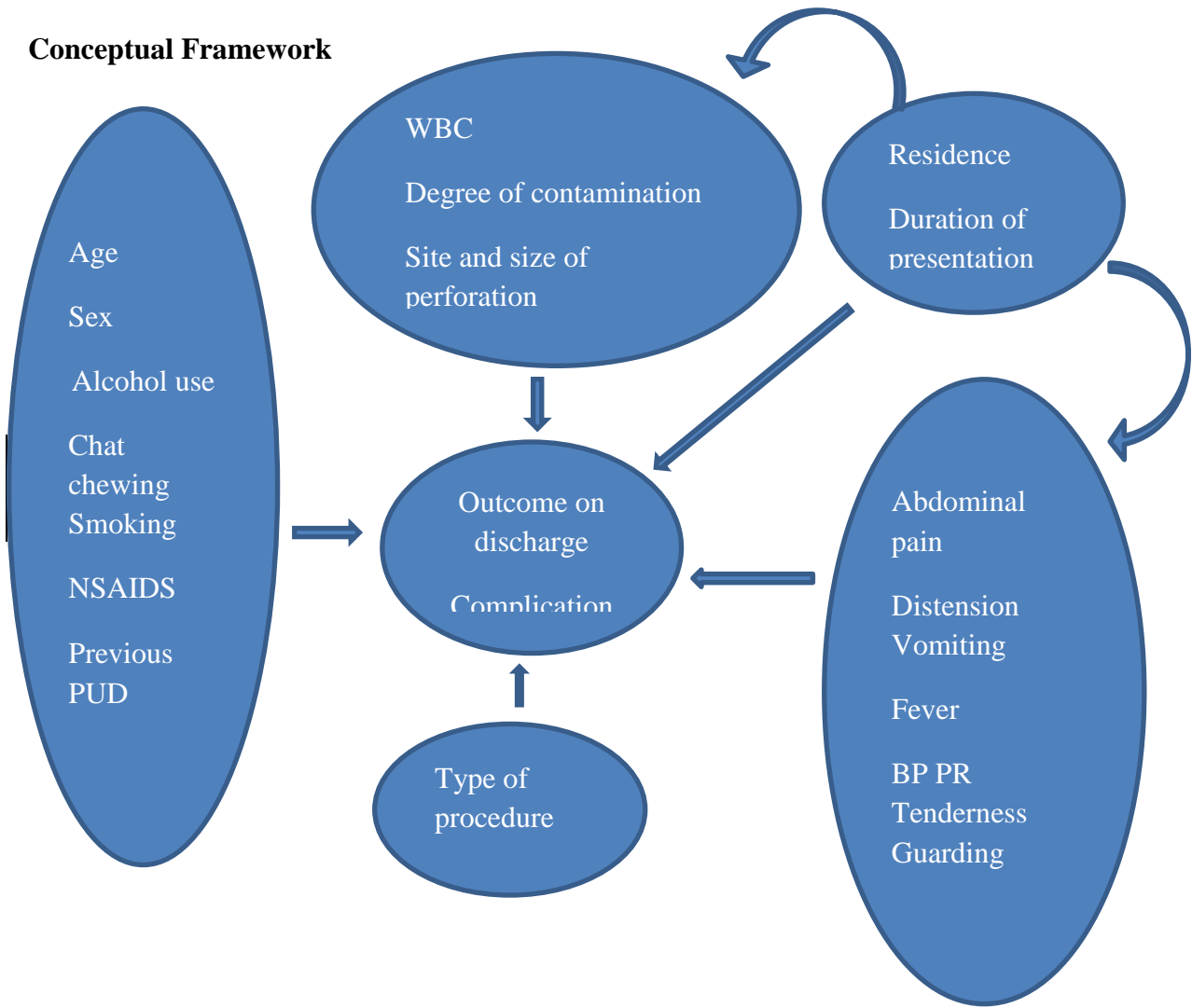


Figure 1 conceptual framework on pattern of presentation and treatment outcome of perforated peptic ulcer disease

Chapter III

3.1. Objectives

3.1.1. Main Objective

- To describe pattern of presentation and treatment outcome of patients operated for perforated peptic ulcer disease from June 1, 2020 to May 30, 2022 at JUMC, Ethiopia

3.1.2. Specific Objectives

- To describe the clinical presentation pattern of patients with perforated peptic ulcer disease
- To assess the type of management and outcome of patients with perforated peptic ulcer disease
- To determine the factors that affect management outcome of patients with perforated ulcer disease

Chapter IV

4.1. Methods and Materials

4.1.1. Study Area and Period

The study was conducted at JUMC, in Surgery Department from June 1, 2020 to May 30, 2022 G.C. JUMC is found in Jimma town, which is located 350km southwest of Addis Ababa. It is the biggest teaching and referral hospital in the south western part of the country. It is one of the universities in Ethiopia known for its pioneer in community-based education. There are 8 specialty Units (Internal Medicine, Surgery, Gynecology and Obstetrics, Ophthalmology, Dermatology, Psychiatry, pediatrics and Anesthesia) run by the Hospital.

Surgery department has its own sub-specialty unit like Plastic Surgery, pancreatic and Hepato-Biliary Surgery, Orthopedic Surgery, Pediatric Surgery, Gastro-Intestinal Oncologic Surgery, Neurosurgery and Urologic Surgery apart from General Surgery. Surgical emergency ward has 36 beds. Major OR has 8 tables one for emergency surgery the rests are for elective.

Surgical ICU has 8 beds and three functioning mechanical ventilators. For all mentioned units above Elective surgery is being operated five days a week on 7 tables both for Surgery and Gynecology and obstetrics electives.

4.1.2. Study Design and Materials

The study was retrospective descriptive cross sectional design. Operation room registration book was used as entry point to have list of patients who had intra operative finding of perforated peptic ulcer during study period. SPSS Version 26 used for analysis. The mean, standard deviation (SD), median and ranges were calculated for continuous variables and proportions and frequency tables were used to summarize categorical variables. Multivariate logistic regression was used for the significance of association between the independent and dependent variables in the categorical variables. The level of significance was considered as $P < 0.05$. Results were presented with bar chart, tables, and histogram and described using texts.

4.1.3. Source Population

All patients who underwent emergency exploratory laparotomy for peritonitis at JUMC during study period are source population.

4.1.4. Study Population

All patients who underwent emergency exploratory laparotomy and found to have perforated peptic ulcer disease during study period

4.1.5. Inclusion Criteria

All patients for whom emergency laparotomy was done and found to have Perforated Peptic Ulcer Disease (PPUD) from June 1, 2020 to May 30, 2022 G.C will be included in the study.

4.1.6. Exclusion Criteria

Patients with viscus perforation other than Peptic Ulcer Disease (PPUD), and lost or incomplete charts were excluded from the study.

4.1.7. Sample Size and Sampling Techniques

A convenience sampling method is used: all perforated peptic ulcer disease patients meeting the inclusion criteria operated during the study period were included.

4.1.8. Study Variables

4.1.8.1. Independent variables

- Age
- Address
- risk factors
- duration of symptoms before presentation
- presenting symptoms
- site of perforation
- size of perforation
- type of procedure done
- amount of GI content

4.1.8.2. Dependent variables

- outcome on discharge
- postoperative complications

4.1.9. Operational Definition

Duration of presentation: the time span between the initial pain perception due to perforation and visit to hospital.

Patch failure: disruption of initial patch repair for perforated peptic ulcer disease

Hospital stay: number days patients stayed in hospital from visit to hospital to discharged improved or death

Management Outcome: is either discharged improved or died after operative management was done for perforated peptic ulcer disease

4.1.10. Data analysis procedure

Data analysis was done with SPSS Version 26 after exported from Epidata. Descriptive analysis was used and frequency statistics, cross-tabulation and multivariate analysis used

4.1.11. Ethical Consideration

Before starting the research, as per the basic principles of World Medical Association Declaration of Helsinki, ethical review committee of Jimma University approved the proposal and provided a support letter. The support letter was given to the head of Jimma university Medical Center. All information was kept confidential during data collection and will be maintained during publication of results.

4.1.12. Limitation of the Study

The study was retrospective our data was limited to patients charts that could be retrieved from record room. There were a number of missed charts which made our response rate low. Also treatment outcome we were referring was till time date of discharge.

4.1.13. Dissemination of Results

The research will be submitted to Jimma University postgraduate and research study office. It will be presented on a national association meeting like, Ethiopian surgical society meeting. It will also be made available for a publication on international journals. Further, it will be uploaded and made available on the Website of Jimma University.

Chapter V

5. 1. Results

Sociodemographic data: During the study period, 106 patients underwent emergency laparotomy for perforated peptic ulcers; of these, 33 patients were excluded from the study due to incomplete data and failure to meet the inclusion criteria making the response rate 70%.

Seventy three patients with perforated peptic ulcer were enrolled in the study consisting of 67 (91.8%) males and 6(8.2%) females with a male to female ratio of 11.2 to 1.

The age range of the patients in the study is from 15 to 70 years with a mean and median of 38.6 ± 13.8 and 38 years respectively. The peak age of incidence was at the 4th decade.

Sixty one (83.6%) patients were from jimma zone while others were from areas surrounding jimma zone. Residence of patients shown in figure 2

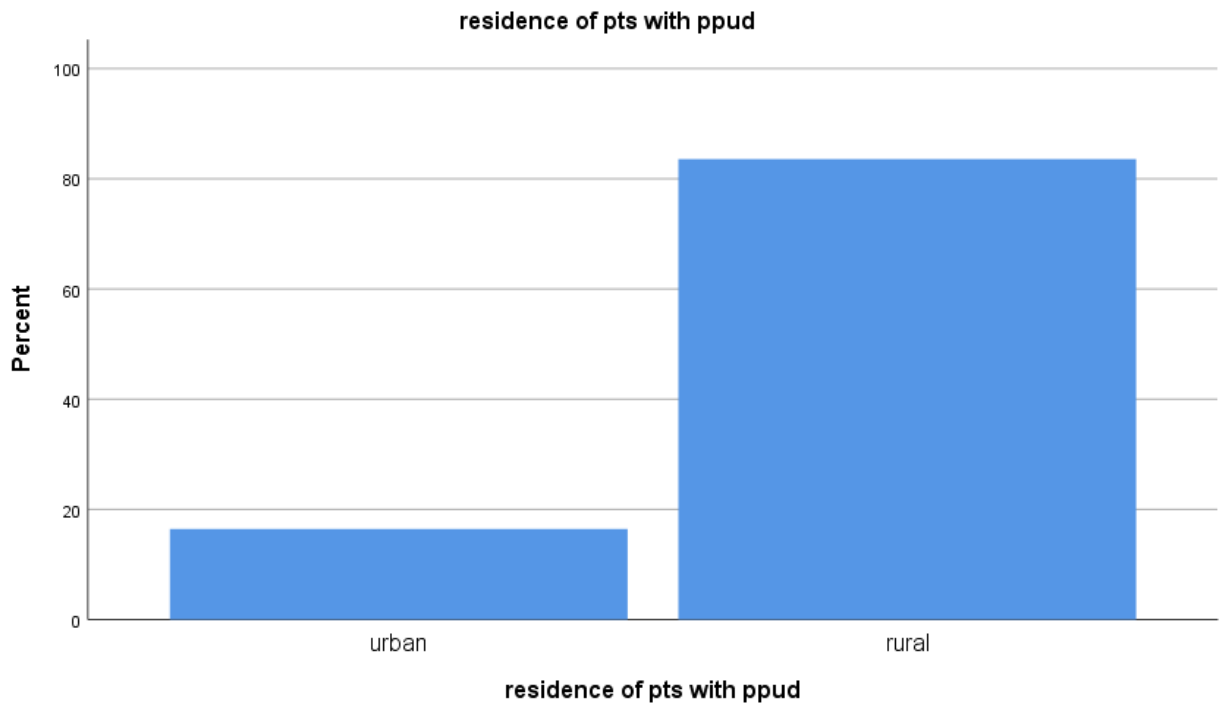


Figure 2 Bar chart showing residence of patients with perforated peptic ulcer disease, at Jimma University Medical Center, Ethiopia.

One (1.4%) patient had documented comorbidity that was on follow up and on medication for hypertension.

Risk Factors:

Forty-two (57.5 %) patients reported previous history of dyspepsia or a history of treatment for peptic ulcer disease. Seven (9.6%) patients have history of smoking or recent smoking among 63 documents with the record (table 1).

Table 1 Risk factors data of patients with perforated Peptic ulcer disease, at Jimma University Medical Center, Ethiopia

Risk factors	Present No (%)	Absent No (%)	Undocumented No (%)
Previous history of dyspepsia	42(57.5)	31(42.5)	0
Smoking	7(9.6)	56(76.7)	10(13.7)
Chat chewing	6(8.2)	45(61.6)	22(30.1)
Use of NSAIDS	0	56(76.7)	17(23.3)
Alcohol consumption	2(2.7)	53(72.6)	18(24.7)
H. Pylori positive	2(2.7)	2(2.7)	69(94.5)

Presentation:

The duration of symptoms ranged from 4 hours to 7 days making the mean and median 2.38 ± 1.88 days and 2 days respectively. Sixteen (21.9%) of the patients presented within twenty four hours of onset of symptoms; over 78% of the cases presented more than 24 hours after the onset of symptoms (figure 3).

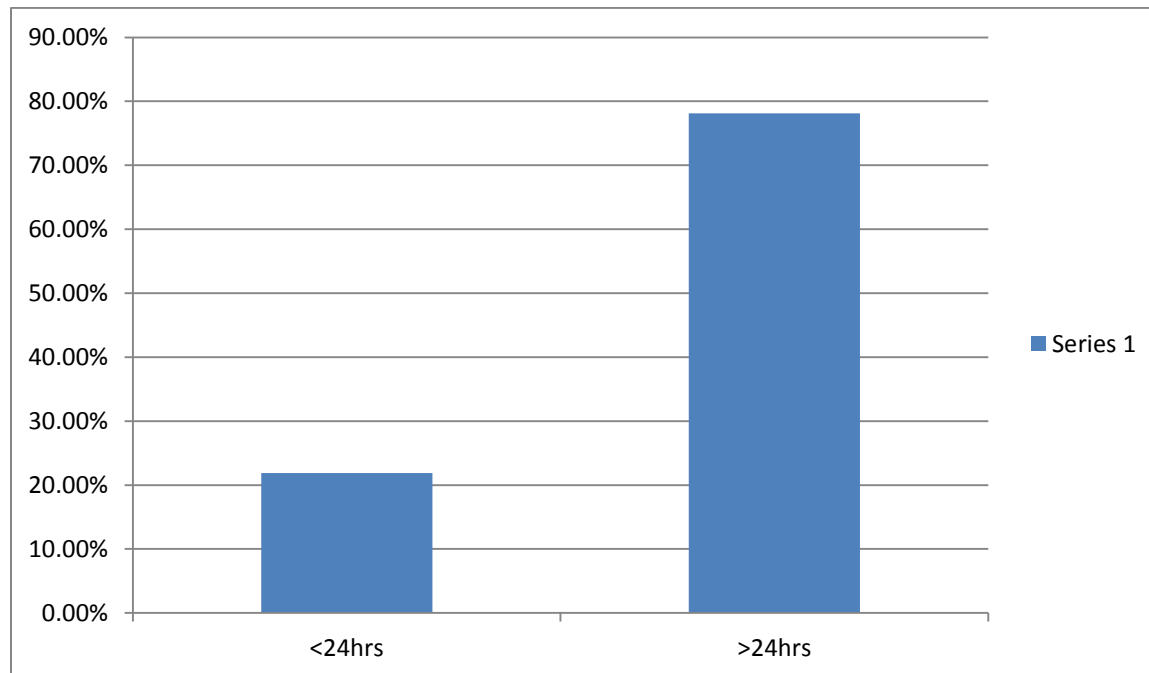


Figure 3 Duration of presenting compliant of patients with perforated peptic ulcer disease at presentation, at Jimma University Medical Center, Ethiopia

All patients in the current study presented with abdominal pain 73(100%), abdominal distension was reported by 57(78.1%), vomiting 55 (75.3%) and fever 24(32.9%). Seven (9.6%) patients presented with un-recordable systolic blood pressure on the arm and four (5.5%) patients presented with not palpable radial pulse. Seven (9.6%) patients presented with systolic BP<90mmHg and fifty six (76.7%) patients presented with PR>100beats/minute. Abdominal tenderness and guarding were demonstrable in all of the patients.

WBC count was normal (4000-11000/mm³) in 32(43.8%) patients, 28(38.4%) of the patients had leukocytosis (WBC> 11,000 /mm³), 13(17.8%) patients had leucopenia of WBC less than 4000/mm³.

Twenty seven (37%) patients had normal range RFT, 15(20.5%) had deranged RFT and 31(42.5%) patients had no RFT done (table 2).

Table 2 Clinical presentation and laboratory finding of patients with perforated peptic ulcer disease, at Jimma University Medical Center, Ethiopia.

Clinical presentation		Number	Percent
<i>1.Presenting compliant</i>	<i>Abdominal pain</i>	73	100
	Abdominal distension	57	78.1
	Vomiting	55	75.3
	Fever	24	32.9
Duration of presentation	< 24hrs	16	21.9
	24-48hrs	28	38.4
	48-72hrs	13	17.8
	>72hrs	16	21.9
Physical finding			
	Abdominal tenderness	73	100
	Guarding	73	100
SBP	Not recordable	7	9.6

	< 90 mmhg	7	9.6
	=/> 90 mmhg	59	80.8
PR	Not palpable	4	5.5
	< 100	13	17.8
	=/> 100	56	76.7
Lab finding			
WBC at presentation	Leucopenia	13	17.8
	Normal	32	43.8
	Leukocytosis	28	38.4
RFT at presentation	Normal range	27	37
	Deranged	15	20.5
	Not done	31	42.5

Intraoperative and procedure done

In fifty five (75.3%) patients perforations were located on the anterior first part of the duodenum, whereas the remaining 18 (24.7%) patients' perforations were on the pre pyloric stomach. The duodenal to gastric ulcer perforation ratio was 3:1. Size of perforation ranges from 3mm to 80mm with mean and median size of perforation 10.23 ± 11.96 mm and 5 mm respectively. Forty seven (64.4%) of the perforations were ≤ 5 mm and twelve (16.4%) were >10 mm, the rest 14(19.2%) were between 5 and 10mm.

The amount of peritoneal fluid varied from 200 to 6000 milliliters with a mean and median of 1813.7 and 1500 milliliters respectively (table 3).

Table 3 Intra-operative finding of patients with perforated peptic ulcer disease, at Jimma University Medical Center, Ethiopia.

		Number	Percent
Location of perforation	Duodenum	55	75.3
	Pre-pyloric/gastric	18	24.7
Size of perforation	< 10mm in diameter	49	67.1
	10– 20 mm in diameter	16	21.9
	> 20mm in diameter	8	11
Peritoneal contamination	< 1L	21	28.8
	1-2L	24	32.9
	>2L	28	38.3

For the majority, 64(87.7%) of the patients repair was done with omental pedicle flap (Cellan Jones). In three (4.1%) patients primary repair of perforations with reinforcement with omental pedicle flap and in two (2.7%) patients repair of perforation with falciform ligament pedicle flap was done. Repair with pedicled omental flap; and Truncal vagotomy and gastro-jejunosomy was done for one patient with prepyloric anterior gastric perforation and the patient discharged improved. Repair with pedicled falciform ligament, pyloric exclusion, gastro-jejunosomy, decompressive dedunosomy and feeding jejunosomy done for one patient with anterior 2nd part of dudenum perforation and the patient discharged improved. Repair with omental pedicled flap and gastrojejunosomy with feeding jejunistomy in one patient and gastrojejunosomy without feeding jejunosomy done in other patient. Patient for whom feeding jejunistomy done discharged improved and patient for whom feeding jejunosomy not done died (table 4). Sub-hepatic drain was put for 21(28.8%) patients.

Table 4 Method of repair for perforated Peptic ulcer disease patients, at Jimma University Medical Center, Ethiopia.

Type of procedure	Number	Percent
Repair with omental pedicle flap	64	87.70%
Primary repair with reinforcement with omental pedicle flap	3	4.10%
Repair with falciform ligament pedicle flap	2	2.70%
Repair with pedicled omental flap; and Truncal vagotomy and gastro-jejunosomy	1	1.40%
Repair with pedicled falciform ligament, PE, GJ, DD and FJ	1	1.40%
Repair with omental pedicled flap and GJ with FJ	1	1.40%
Repair with omental pedicled flap and GJ	1	1.40%

Remark- DD: decompressive duodenostomy, FJ: feeding jejunosomy GJ: gastrojejunosomy,PE: pyloric exclusion

Postoperative outcome

Sixty nine post-operative complications were recorded in 33(45.2%) patients. Of these, Hospital-acquired pneumonia (20, 29%) was the commonest. The other complications were postoperative intra- abdominal collections (19, 27.5%), surgical site infection (16, 23.3%), patch failure (7, 10.1%) and wound dehiscence (7, 10.1%). Seventeen (23.3%) patients were re-operated for repair site failure, intra-abdominal collection and wound dehiscence. Sixty one (83.6%) patients

were discharged improved and twelve (16.4%) died. More than half (61.6%) patients were discharged within 8 days (table 5).

Multivariate analysis was done for possible factors affecting postoperative morbidity and mortality; and degree of peritoneal contamination was significantly associated with postoperative morbidity and mortality ($P < 0.05$). Out of 67 male patients 28(41.8%) of them developed complication.

Table 5 Morbidity, Mortality, Duration of hospital stay of patients with perforated peptic ulcer disease, at Jimma University Medical Center; Ethiopia.

Variables		Number	Percent
Morbidity	Hospital-acquired pneumonia	20	29
	postoperative collections	19	27.5
	surgical site infection	16	23.3
	patch failure	7	10.1
	wound dehiscence	7	10.1
Hospital stay	< 7days	19	26
	7-14 Days	41	56.2
	>14 days	13	17.8
Outcome	Discharged improved	61	83.6
	Died	12	12.4

CHAPTER VI

6. 1. Discussion

This study showed that male to female ratio of patients with perforated peptic ulcer disease is 11.2 to 1.0. This finding is comparable to one study done at Kenyatta National Hospital, Nairobi, by Nasio A, where the male to female ratio was reported to be 8.3: 1(15). A study by Doumi EA et al, from El Obeid Hospital, Western Sudan and a study by Phillip L Chalya et al. from Tanzania showed the male to female ratio of 16.7 to 1 and 1.3 to 1 respectively (11,17). This difference in incidence do not seem to be the case in developed countries as a study by Thorsen K et al. on epidemiology of perforated peptic ulcer disease in Norway showed females to males ratio of 1.2:1(20).

The mean age of patients in this study is just 38.6 and the peak age of incidence was at the 4th decade suggesting that our patients here in Ethiopia are much younger than most other reports. Two studies from Nigeria (one on Five-Year Review of Perforated Peptic Ulcer Disease in Irrua, Nigeria by A. E. Dongo et al. and another on Audit of Perforated Peptic Ulcer Disease in a Tropical Teaching Hospital) showed the pick age of their patients to be on 5th decade(13).

Fifty eight percent of our patients gave history of previous PUD and this is similar to reports from Saint Paul's Hospital Millennium Medical College (SPHMMC) where 60% had PUD history but the study in Irrua, Nigeria 59.6% had no history of peptic ulcer disease(4). In this study risk factors like smoking, chat chewing and use of alcohol were 9.6%, 8.2% and 2.7% respectively which was much lower than study done in Addis Ababa by Bupicha et al which showed 33%,17.5% and 45.5% respectively(19). Another study done by Teshome et al at SPHMMC showed the same strong association of these risk factors and perforated peptic ulcer disease(4). This difference seems to be associated with poor documentation of patient's risk factor in our case. In order to know true relationship between known risk factors and perforated peptic ulcer disease, prospective study looks better to address this observed poor documentation.

In our study, 78.1% of the patients presented after twenty-four hours of onset of symptoms which was nearly similar to study done at El Obeid Hospital, Western Sudan by Doumi EA et al

and South Nigeria by Dodiya-Manuel A et al which was 85% and 88.9% respectively(11,12). In study done on Pattern and outcome of perforated peptic ulcer disease patient in four teaching hospitals in Addis Ababa by Bupicha et al almost half (45.4%) of patients presented within 24hours of onset of symptoms(19). The disparity among this study and study done by bupicha et al, at Addis Ababa can be explained by; only 16.4% of patients with perforated peptic ulcer disease came from urban in our case and 84.5% of patients came from urban in study done at Addis Ababa. Abdominal pain was the presenting complaint in all of our patients followed by abdominal distension and vomiting similar to finding at Tertiary Hospital in Mogadishu- Somalia by Ali AM et al(10).

Abdominal tenderness and guarding were present in all patients (100%) in this study and this is nearly similar to the study in eastern India where 97.8% of their patients had abdominal rigidity or guarding and on study done at a Tertiary Hospital in Kigali, Rwanda, all of their patients had findings consistent with generalized peritonitis either rebound and/or guarding(16,21). The study from Tanzania also showed that abdominal tenderness and classical signs of peritonitis were demonstrable in 88.1% of their patients(17).

In this study hypotension at presentation were observed in only 14 of 73(19.2%) patients which is similar (17.5%) with study done by Bupicha et al on Pattern and outcome of perforated peptic ulcer disease patient in four teaching hospitals in Addis Ababa. but the Tanzanian study done Phillip L Chalya et al reported shock occurred in 33.3% of their patients(17,19).

Leukocytosis were found in 28(38.4%) our patients which are nearly similar with studies done at Saint Paul's Hospital Millennium Medical College which is 40.3 % and four affiliated teaching hospitals (Minilik hospital, Yekatit-12 hospital, Zewditu Memorial Hospital, Tikur Anbessa specialized hospital 46.4%(4,19). but 91.2% had leukocytosis in the Indian study(4,19,21).

The location of the perforation is first part of duodenum in 75.3% of our patients. This is similar to the study in Tertiary Centre in South Nigeria by Dodiya-Manuel A et al(12). In a study at Northwestern Tanzania most perforations were located on the duodenum (92.9%). Reports from Norway, The Netherlands and Iceland showed gastric ulcer perforation predominate over duodenal perforations in that part world(17,20).

The size of the perforation is < 10 mm in diameter in 67.1 % of our patients. On studies done at Black lion hospital in Addis Ababa by Bupich A et al and Saint Paul's Hospital Millennium Medical College by Teshome et al it was 81.3% and 90.4 % respectively(4,19).

Intra peritoneal contamination with gastric content mixed with pus in excess of 1000ml was found in 71.2 % of our patients whereas it was found to be 90.7% of patients in a study done by Bekele A et al at Minilik II Memorial Referral Hospital, Addis Ababa(9).

Omental pedicle flap (Cellan Jones) was done in 64(87.7%) of patients in our study which is in concordance (95.4%) with a study done by Bekele A et al at Black Lion Hospital , Addis Ababa. However, 4 (6.3%) of these patients developed patch failure following omental pedicle flap and this is also similar to study done at Black Lion Hospital(9). This is may be due to the advanced nature of the peritonitis and extremely fragile duodenal margin which doesn't hold sutures easily. Faulty repair technique may also play a role. The applied tension to the sutures should be strong enough to stabilize the omentum in place, but loose enough to preserve the omental blood supply(3).

In this study morbidities such as patch failure, pneumonia, SSI occurred in 33(45.2%) of 73 patients and this looks high compared to study done at black lion hospital by Bupich et al (16.5%)(19). Old age, comorbidity, late presentation, and who developed complications had a higher rate of mortality in study done by Phillip L Chalya et al. from Tanzania(17).

We have twelve postoperative deaths making mortality rate 16.2% and this is nearly similar with studies done at Black Lion Hospital Addis Ababa(19%) and Irrua, Nigeria (17.3%) (13,22). But ours looks higher than studies done in our country by Bekele A et al at Minilik II Memorial Referral Hospital (10.3%), by Zerefa WA et al at Dessie Referal Hospital (4%), Bupicha et al at affiliated teaching hospitals (Minilik Hospital, Yekatit-12 hospital, Zewditu Memorial Hospital, Tikur Anbessa specialized hospital (3.1%) and by Teshome et al at Saint Paul's Hospital Millennium Medical College (6.6%)(4,9,18,19). In our study, our data retrieval rate was 70% due to lost patients' charts from record room and the true mortality rate can be affected with this cofounding factor.

In this study degree of peritoneal contamination was significantly associated with postoperative morbidity and mortality ($P < 0.05$) and in study done on Pattern and outcome of perforated peptic

ulcer disease patient in four teaching hospitals in Addis Ababa; higher age (> 40 years), longer duration at presentation (> 48 h), hypotension at presentation, higher degree of peritoneal contamination were significant risk factors for postoperative morbidity and mortality.

CHAPTER VII

7.1. Conclusion and Recommendation

7.2. Conclusion

This study was retrospective study and it was impossible to truly assess common known risk factors. Both morbidity and mortality were higher as compared with majority of the studies. Hospital acquired pneumonia; surgical site infection, wound dehiscence, and patch failure were common post-operative complications in this study. In this study degree of peritoneal contamination was significantly associated with postoperative morbidity and mortality.

7.2. Recommendation

Prospective research has to be done to accurately assess known risk factors for PPUD. The hospital unit in charge of keeping records needs to pay attention to the alarmingly high number of lost patient charts caused by improper data handling. Awareness creation for nearby health facility staffs on the importance of early referral and health education for the community for early health care seeking behavior needs to be done.

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Annex I

Questionnaire

Part I Socio- Demographic Variables			
S.No	Questions	Response	Remark
1	Age at presentation in years		
2	Sex	1. Male 2. Female	
3	Residence	1. Urban 2. Rural	
4	Address	1. Jimma zone 2. Out of Jimma zone	
5	Comorbidity	1. Yes 2. No	
6	If Yes ,which comorbidity	1. Diabetes mellitus 2. Hypertension 3. AIDS 4. Known cardiac illness 5. Diabetes +hypertension 6. Diabetes +AIDS 7. Other _____	
7	Previous history of PUD	1. Yes 2. No	
8	Smoking	1. Yes 2. No	
9	Chat chewing	1. Yes 2. No	
10	Use of NSADS	1. Yes 2. No	
11	Alcohol consumption	1. Yes 2. No	
12	H. pylori infection	1. Yes 2. No	

Part II Clinical features and presentation

S.N	Questions	Response	Remark
13	Diffuse abdominal pain	1. Yes 2. No	

14	Vomiting	1. Yes 2. No	
15	Fever	1. Yes 2. No	
16	Abdominal distension	1. Yes 2. No	
17	Duration of illness at presentation	1. < 24hrs 2. 24- 48hrs 3. 48-72hrs 4. >72hrs	
18	SBP < 90	1. Yes 2. No	
19	PR > 100	1. Yes 2. No	
20	Abdominal tenderness	1. Yes 2. No	
21	Guarding	1. Yes 2. No	
23	WBC according reference range for laboratory	1. Elevated 2. Norma range 3. Low	
24	RFT	1. Normal range 2. Deranged	
Part III Intra operative finding and procedure done			
25	Which part of gut perforated?	1. Duodenum 2. Gastric	
26	If duodenum on Q27, which sides of wall of duodenum perforated?	1. Anterior wall 2. Posterior wall	
27	If gastric on Q27, which side of wall of gastric perforated?	1. Anterior 2. . posterior	
28	Perforation size	1. <10mm 2. 10-20mm 3. >20mm	
29	Contamination	1. < 1 lt 2. 1-2 lt 3. > 2 lt	
30	Procedure done	1. Primary closure by interrupted sutures 2. Primary closure by interrupted sutures covered with pedicle omentoplasty 3. Cellan-Jones repair: plugging the perforation with pedicle omentoplasty	

		<ul style="list-style-type: none"> 4. Graham patch: plugging free omental plug and laying and tying 3 sutures. 5. Sealed, no patch needed 6. Truncal vagotomy and drainage procedure 	
31	Drainage left after repair	<ul style="list-style-type: none"> 1. Yes 2. No 	

Part IV: Morbidity, Hospital Stay and Outcome

32	Complication	<ul style="list-style-type: none"> 1. Yes 2. No 	
33	AKI	<ul style="list-style-type: none"> 3. AKI 4. Leak 5. Pneumonia 6. Post-operative collection 7. Wound dehiscence 	
34	Patch failure	<ul style="list-style-type: none"> 1. Yes 2. No 	
35	SSI	<ul style="list-style-type: none"> 1. Yes 2. No 	
36	Pneumonia	<ul style="list-style-type: none"> 1. Yes 2. No 	
37	Post-operative collection	<ul style="list-style-type: none"> 1. Yes 2. No 	
38	Wound dehiscence	<ul style="list-style-type: none"> 1. Yes 2. No 	
39	Re operated	<ul style="list-style-type: none"> 1. Yes 2. No 	
40	Hospital stay	<ul style="list-style-type: none"> 1. <7days 2. 7-14 days 3. >14 days 	
41	Outcome	<ul style="list-style-type: none"> 1. Discharged improved 2. Died 	