

## Demographic, Clinico-Pathological Study And Management of Peptic Ulcer Perforation

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### Abstract

**Introduction:** Peptic ulcer disease (PUD) is a worldwide health problem because of its high morbidity, mortality and monetary loss. The incidence of uncomplicated peptic ulcer disease has lowered dramatically due to usage of proton pump inhibitors and H<sub>2</sub> receptor antagonists. Complicated peptic ulcer disease is still a concern all over the world and perforation is the most common complication followed by bleeding.

**Material and Methods:** This is a retrospective/prospective study of 60 cases of peptic ulcer perforation carried out in MediCiti institute of Medical science, from July 2012 to September 2017. Out of 60 peptic ulcer perforations, 51(85%) were males and 9 (15%) were female showing strong male predominance with male: female ratio 5.66:1. More number of cases observed in 5<sup>th</sup> decade followed by 3<sup>rd</sup>, 6<sup>th</sup> & 7<sup>th</sup> decade. 45 patients (75%) had h/o alcohol consumption and 35 patients (58.33%) had smoking history. 15 patients (25%) had h/o peptic ulcer disease and 10 patients (16.66) had h/o taking NSAIDs. All the cases presented with pain abdomen (100%) followed by vomiting (55%) and distension (33.33%). Gas under diaphragm was present in all the cases (100%). 1<sup>st</sup> part of the duodenum was most common site of perforation followed by pre pyloric part of the stomach. Laparotomy and closure perforation was done by open methods with a mortality rate of 3.33%. The aim of our study is to share our experience to evaluate demographic values and risk factors for perforated peptic ulcer and to find out the mortality rate.

**Keywords:** Gas under diaphragm (GUD), Non steroidal anti inflammatory drugs (NSAIDs) Peptic ulcer disease (PUD), Peptic ulcer perforation (PUP).

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### I. Introduction

Travers first presented a series of duodenal ulcer perforation in 1817. The earliest operative description was made by Mikulicz in 1884; however successful operation for a perforated duodenal ulcer was not carried out until 1894. Peptic ulcer disease (PUD) is a public health problem because of its worldwide distribution, associated with high morbidity, mortality and monetary loss [1, 2 and 3]. The incidence of uncomplicated PUD has come down with the advent of H<sub>2</sub> receptor antagonists and proton pump inhibitors. However perforation and bleeding ulcer remained as a serious problem, despite of advancement in the diagnosis and treatment [4, 5]. The incidence of perforation still remained as life threatening problem, it is probably due to increased risk factors like smoking, taking alcohol and NSAIDs [6]. Pain abdomen is the most common clinical feature followed vomiting, tenderness, abdominal distension. Rigidity and guarding, absence of bowel sounds are the classical clinical signs of PUP and are diagnostic. Plain X-ray erect abdomen is the essential part of the investigation, presence of gas under diaphragm (GUD) is diagnostic. Simple closure of the perforation with omental patch, thorough peritoneal lavage and draining the peritoneal cavity by bilateral flank drain is the essential part of the treatment. Closure perforation can be carried out by open method or by laparoscopic procedure. In some centres, definite treatment of peptic ulcer is being practiced along with closure perforation but this practice is not so popularised. Simple closure with omental patch is standardised and is acceptable procedure all over the world. Definite treatment like vagotomy with bypass procedures will be undertaken at later date.

## II. Material & methods

### 2.1 Study design

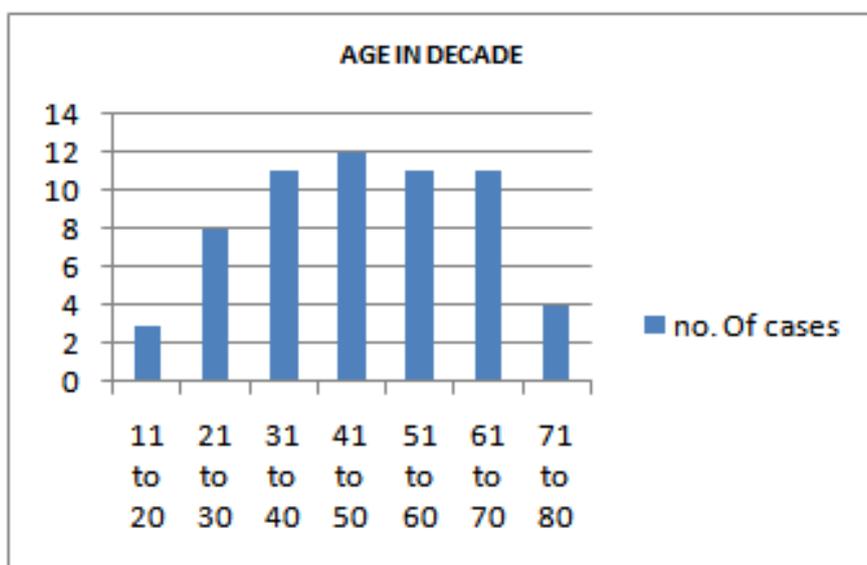
It is a retrospective/prospective; the study period was from September 2011 to September 2017 with a Sample size of 60 cases. The patients who admitted in the department of general surgery and treated on emergency basis were taken as study group. MediCiti Institute of Medical Sciences was the place of study, a tertiary care post graduate teaching hospital in the suburb of Hyderabad city, Telangana State – South India. The aim of this study is to evaluate the demographic and clinico-pathological data of peptic ulcer perforation, management and its outcome in our area and compare with the literature.

### 2.3 Study subject

All the patients who operated for peptic ulcer perforation were included. The patients with incomplete data from retrospective group and who refused to give consent for surgery or treated conservatively are excluded. The details of the patients data was gathered from the MRD of MediCiti Institute of Medical Sciences. Written consent is taken from the patients who recruited prospectively and prior permission was taken from hospital ethical comity. Detailed history of the patients was taken and clinical examination was done. Patients were operated after investigation like plain X-ray erect abdomen, after assessing haematological and diabetic status, renal profile, electrolytes and urine analysis. All are operated by open method by giving midline incision; perforation was closed with non absorbable 2-0 silk sutures and supplemented by omental patch (Graham's omentopexy). Total number of patients N – 60

Age in decades	n	%
11-20	03	05.00
21-30	08	13.33
31-40	11	18.33
41-50	12	20.00
51-60	11	18.33
61-70	11	18.33
71-80	04	06.66

**Table1.** Showing age incidence



**Graph1.** Showing age incidence

**2.4 Age incidence:** in this study, maximum number of cases observed in 5<sup>th</sup> decade of life followed by 4<sup>th</sup>, 6<sup>th</sup> & 7<sup>th</sup> decades.

**2.5 Sex incidence**

out of 60 cases of PUP, males were 51 (85%) and females were 9 (15%) with male: female ratio is 5.66:1, indicating male preponderance. 45 cases (75%) presented with h/o alcohol consumption, 35 (58.33%) cases with smoking history and 10 (16%) cases with history of taking NSAIDs. Therefore alcohol is the most common etiological factor for peptic ulcer perforation we observed followed by smoking and taking NSAIDs. Both alcohol and smoking is collectively contributing 66.66% risk. 15 (25%) cases presented with history of PUD.

**2.6 Clinical features**

Epigastric pain was the fore most symptoms present in all 60 (100%) cases followed by vomiting in 33 (55%) cases and abdominal distension in 20 (33.33%) cases. Tenderness was present in all 60 (100%) cases and rigidity and guarding present 40 (66.66) cases. Absence of bowel sounds noticed in 15 (25%) cases, 15 (25%) cases presented with shock %. 5 (8.33%) cases presented with fever. Plain X-ray erect abdomen was showing gas under the diaphragm (GUD) in all 60 (100%) cases (fig.1) and it is diagnostic. USG abdomen was showing pneumo-peritoneum with free fluid in 40 (66.66%) cases. CBP was showing elevated total count with polymorphosis in 40 (66.6%) cases .

n-number of patients

Symptoms & signs	n	%
Pain	60	100.00
Vomiting	33	55.00
Distension	20	33.33
Tenderness	60	100.00
Rigidity & guarding	40	66.66
Absent bowel sounds	15	25.00
Shock	15	25.00
Fever	05	08.33

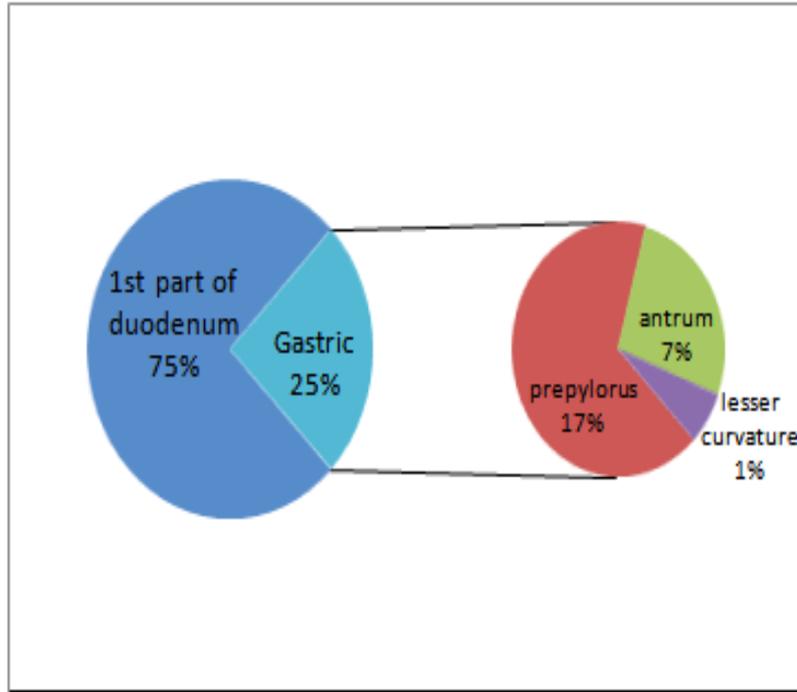
**Table 2.** Showing clinical features



**Figure 1.** Crescent shape gas under rt. dome of the diaphragm indicating perforated peptic ulcer

All patients were operated by midline incision. Colour of the peritoneal fluid was bilious in 33 (55%) cases and purulent in 27 (45%) cases. Perforation was found on the first part of the duodenum in 45 (75%) cases

(fig. 2) and in 15 (25%) of the cases perforations was found on the stomach. Within the stomach, 10 (16.6%) perforations were found in the pre pyloric part (fig.3), 4 (6.6%) in antral part and 1 (1.6%) in lesser curvature of the stomach. Size of the perforation ranged from 0.5-1cm in 45 (75%) cases, all of them were found on the 1<sup>st</sup> part of the duodenum. The size of other perforations ranged from 1-2cm and above, was located on the stomach. Largest perforation measured 4cm was found in the antral part of the stomach. All the perforations were closed by simple closure by 2-0 silk reinforced suture line by giving additional omental patch to prevent the leak from sutured site. Postoperatively, leak was persisting from largest perforation which forced us to gastro-jejunostomy further forced us to do distal gastrectomy.



**Graph 2**, showing location of the perforation



**Figure 2.** Perforation found on the 1st part of the duodenum



**Figure 3.** Perforation found on the pre pyloric part of the stomach

Out of 60 cases 38 (63.3) cases had uneventful recovery, 22 (36.66) cases went in to complications necessitating more hospital stay resulting in increased morbidity. Surgical site infection was the most common complication observed in 16 (26.66%) followed by septicaemia in 5 (8.33%) cases. 5 (8.33%) cases developed post operative leak, 1 renal failure, 1 respiratory failure we observed. Morbidity was observed more in 5<sup>th</sup> to 7<sup>th</sup> decade. 2 (3.3%) deaths were reported out of 60; both of them were upper age group i.e. one in 7<sup>th</sup> and other in 8<sup>th</sup> decade. The factors associated with morbidity and mortality includes upper age group, late presentation > 24 hours to Hospital, associated with shock, peritoneal fluid was purulent. Presence of comorbid conditions like diabetes and lung infection was also contributed for more morbidity and mortality.

### **III. Discussion**

The incidence of uncomplicated PUD has come down with advent of H<sub>2</sub> receptor antagonists and proton pump inhibitors, however the complications, particularly perforation has remained with same proportion, despite of advancement in the diagnosis and treatment [4, 5]. In our study we had 60 cases of peptic ulcer perforations in 6 years of duration, averaging 10 cases per year which is an equal to other studies in the literature (1, 7&8). As per as age incidence, peptic ulcer perforation was spanned from 2<sup>nd</sup> to 8<sup>th</sup> decades, however more number of cases observed in 5<sup>th</sup> decade followed by 4<sup>th</sup>, 6<sup>th</sup> & 7<sup>th</sup> decades. Males were outnumbered than the female and male: female ratio was 5.66:1 which is much higher when compared to other studies from the underdeveloped countries [4, 9]. Both alcohol and smoking is collectively contributed a risk of 66.66% in our study, probable this could be a risk factor for higher male preponderance. Alcohol causes, mucosal damage by stimulating acid secretion and increase gastrin level [10]. Smoking inhibits bicarbonate secretion from pancreas which results in increased acidity in the duodenal bulb and also inhibits healing of the duodenal ulcer [9, 11]. It is observed that taking NSAIDs is a risk factor since NSAIDs inhibit the synthesis of prostaglandins which reduce mucosal blood flow, vulnerable to peptic ulceration and its perforation. We observed 10 (16.66%) cases taking NSAIDs. The incidence of taking NSAIDs in this study is little higher than the other developing countries, as coated by Phillip L Chalya at all from Tanzania in their study. However the incidence of taking NSAIDs is more in the developed countries. 15 (25%) cases presented with h/o peptic ulcer disease [12]. Our demographic profile is sharply differed from developed countries where the majority of the patients are above 60 years and the incidence are higher in females over 60 years of age and above [13]. The gap interval between first symptom and initiation of treatment is good predictor of outcome. In the present study 41 (68.33%) cases presented before 24 hours showing good recovery, less morbidity and no mortality. 19 (31.66%) cases presented after 24 hours had more morbidity, 2 deaths were observed. They also developed complications like septicaemia, renal failure and more chance of developing surgical site infection. In this study diagnosis was made by taking history, clinical examination and finding gas under the diaphragm on plain X-ray erect abdomen (fig.1). Pain was the most common symptom which was in the epigastric region, presented in all 60 cases (100%) followed by vomiting in 55%, and distension 33.33% of the cases. Most common sign is tenderness in all the cases making 100% followed by rigidity and guarding in 40 cases (66.66%), absence of bowel sounds in 15 (25%) of cases. fever was present in 5 cases, presence of fever is an indirect evidence of bacterial peritonitis. 27 (45%) cases presented with purulent peritonitis where total leukocyte count was elevated along with high

polymorphonuclear leukocytes. All above mentioned factors observed in 2 cases dead. We observed plain x-ray abdomen is superior to USG abdomen, presence GUD in plain x-ray abdomen was cent per cent diagnostic [14, 15 and 16]. Free fluid with coiled small bowel loops can be assessed with USG abdomen which is an indirect evidence of perforation and peritonitis. CT scan with oral contrast is considered when small amount of pneumo peritoneum is present to assess the sealed up perforation. Total count elevated ranged from 11000 to 18000 and above. In 17 (28.33%) case total count was elevated >18000 indicating bacterial peritonitis which increased the morbidity and mortality. Laparotomy was done by midline incision in all the cases by open method. The most common site of perforation was in the first part of the duodenum in 45 (75%) case followed by gastric ulcer perforation 15 (25%). The ratio of duodenal ulcer perforations to gastric ulcer perforations is 3:1 which is comparable to western world literature [17]. Simple closure perforation was done in all the cases with Graham's omental patch. This procedure can easily be done even by an inexperienced surgeon effectively with acceptable morbidity and mortality [18]. Perforation can also be closed by laparoscopic technique however we had not tried. Open method is superior since it is an emergency procedure, will take shorter time than the laparoscopic procedure. More operative time is a major concern in the laparoscopic group [19] where most of the patients present with cardiovascular instability.

Over all complications rate is 46.66% in this study which is more when compare to other studies in which reported rate of complications 29.8% [14, 20]. Most common complication was surgical site infection 26.66% followed by post operative leak 8.33% and septicaemia 8.33%. Leak is a trouble complication may increase the morbidity and mortality. All the leaks were reported from gastric perforation and forced us to reopen and re sutured. One case we did gastro-jejunostomy in 2<sup>nd</sup> attempt, hoping distal perforation will be sealed off. On 3<sup>rd</sup> attempt we were forced to do a distal gastrectomy distal to the previous site of gastro-jejunostomy. Peptic ulcer perforation is a life threatening condition having reported mortality is 5%-25% [19, 21]. In this study out of 60 cases 2 deaths were reported making mortality rate 3.33% only. Early hospitalisation and early operation along with good antibiotic coverage could be the reason for low mortality. H-pylori it is not investigated in our study however anti H-pylori treatment protocol was followed post operatively.

#### **IV. Conclusion**

Perforation is the most common complication of peptic ulcer disease. We did not get a single case of bleeding ulcer case in our study group, however we had one case of pyloric stenosis. Perforation is more common in 4<sup>th</sup> to 7<sup>th</sup> decades of life. Males are outnumbered to female with male female ratio is 5.66:1. Alcohol consumption and smoking is the main aetiological factor making 66.66% of the cases. Pain epigastric region, vomiting and distension of the abdomen are cardinal symptoms. Tenderness, rigidity and guarding along with absence of bowel sounds are the cardinal signs of perforation. Patients who presents late may have fever, cardiovascular instability with septicaemia and may have organ failure like renal and respiratory failure. Plain X-ray erect abdomen is most important diagnostic aid which shows pneumoperitoneum i.e. presence of gas under the diaphragm. Contrast CT may be useful when sealed up perforation is encountered. Simple closure perforation is the treatment of the choice with omental patch. Open method is preferred than the laparoscopic procedure, since operating time is shorter in open method and most of the patients presents with cardiovascular instability. Surgical site infection is most common post operative complication followed by septicaemia and leak from sutured site of perforation. Leak sometimes demand reopening and closure. Time of hospital admission is crucial factor; late presentation may lead to bacterial peritonitis and septicaemia sometime death. Elevated leukocyte count with purulent peritoneal fluid is an indirect evidence of bacterial peritonitis, herald increased morbidity and mortality.

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