



# A CLINICAL STUDY OF PERFORATED PEPTIC ULCER IN YOUNG PEOPLE IN JAMMU- A PROSPECTIVE STUDY

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## ABSTRACT:

**BACKGROUND:** Peptic Ulcer Disease is the ulceration of the gastrointestinal tract due to hyper acidity, resulting in mucosal erosion, acute pain and discomfort. Perforated Peptic Ulcer (PPU) is a life-threatening complication of peptic ulcer disease which is observed in around 2-14% of cases of peptic ulcer disease. A total of 100 patients were enrolled for study. Maximum incidence of ulcer perforation was seen in fourth decade. The ratio of male to female was approximately 12:1. Out of 100 patients, 92 patients were found to have pre-pyloric perforation while in 08 patients, the site of perforation was found to be in first part of duodenum. Fifty-five patients were positive for helicobacter pylori while 45 patients were tested negative. H.Pylori associated PUD is reported to be the commonest cause of morbidity and mortality, in especially LMIC nations. It is also one of the commonest abdominal emergency causing peritonitis. The outcome is multi-factorial depending on various factors like the underlying pathology, any co-morbid condition, the interval between perforation and treatment and the patient's age.

**KEYWORDS:** Peptic ulcer disease, PPU, Perforation, Vagotomy, SSI.

## **INTRODUCTION:**

Peptic Ulcer Disease (PUD) is described as the ulceration of the gastrointestinal mucosa due to increased acid secretion, leading to mucosal erosion, acute severe pain and discomfort. The erosion must be  $>0.5\text{cm}$  and occurs due to an imbalance between secretions in the stomach and duodenum. Stomach and duodenum consist of a mucosal lining which protects them from digestive secretions. Peptic Ulcer Disease includes both gastric and duodenal ulcers, which may be acute or chronic and ultimately resulting from an imbalance between mucosal defences and acid/peptic injury.[1] Peptic Perforation is one of the commonest surgical emergency, which could be life threatening and reported to occur in about 2-14% of cases with PUD. Gastrointestinal perforations have haunted mankind from time immemorial but it was recognized clinically as a perforated peptic ulcer in 1799. The first successful surgical management for perforated gastric ulcer was done by Ludwig Heusner in Germany in 1892, in the form of partial gastrectomy. In 1894, Henry Percy Dean from London successfully repaired a perforated duodenal ulcer. Partial gastrectomy, although performed very early, did not become a popular treatment until the 1940s, when Truncal vagotomy was introduced for the treatment of duodenal ulcer perforation. The next development in the management of peptic ulcer perforation was the introduction of highly selective vagotomy in the late 1960s.[2] About 4 million people worldwide are affected every year with peptic ulcers. The annual incidence rates of PUD are 0.10-0.19% for physician-diagnosed PUD and 0.03-0.17% when based on hospitalization data.[3] In India, more prevalence is reported in the southern part and about 10-20% of patients encounter complications of which 2-14% cases are reported with peptic perforations. The common sites of perforation are observed in prepyloric, pyloric and duodenal regions. Despite recent advances in the diagnosis and management of peptic ulcers, the rate of peptic perforation is still increasing and has become one of the major health challenges, especially in younger individuals. [4]

### **AIM:**

- To study the young age incidence, sex distribution, clinical presentation and etiological pattern of peptic ulcer perforation.
- To study the positivity of radiological features
- To study the condition at the time of presentation, the type of operative intervention and its final outcome.

## **MATERIAL AND METHODS:**

### **STUDY DESIGN:**

A prospective study was conducted in the department of general surgery, GMC Jammu, for a period of 12 months from November 2019 to November 2020

### **INCLUSION CRITERIA:**

- Patients with a confirmed diagnosis of Peptic Ulcer Perforation

- Age < 40 years
- Both males and females

### EXCLUSION CRITERIA:

1. Patient having perforation associated with malignancy
2. Patients with perforation in any other part of the gastrointestinal tract
3. Patient having perforation as a result of corrosive acid poisoning
4. Patients with recurrent perforation
5. Traumatic Perforation
6. Typhoid or tubercular perforation
7. Patient not giving consent for surgery

### Predicting morbidity & mortality:

Morbidity was assessed in terms of:

- duration of hospital stay
- Intra-operative/Post operative complications:
  - Surgical site infection
  - Leak at the repair site
  - Pulmonary complications
  - Fever

Patients presenting to surgical emergency as acute abdomen with relevant history and clinical signs suspicious of peritonitis were subjected to hematological, biochemical and radiological investigations including an X-ray abdomen standing with both domes of the diaphragm to check for the presence of free gas under the diaphragm (as per proforma). As soon as the diagnosis of perforation peritonitis was made, following resuscitation, the such patient was posted for surgery (after obtaining well-informed consent) and intra-operatively diagnosis of PUP (Peptic Ulcer Perforation) was confirmed.

### FOLLOW UP:

During the post-operative period, the patients were evaluated for mortality and morbidity. Those with uneventful recovery were discharged and those having any complications were managed accordingly. Once discharged, patients were followed up for 2 weeks on an outpatient basis and after that as per requirement. HP Kit was prescribed for 2 weeks and was due during the follow-up period for confirmation.

**RESULTS:**

A total of 100 patients who presented with ulcer perforation were enrolled in the study. Maximum incidence of peptic ulcer perforation was seen during the fourth decade considering age below 40 years. There were 62% patients in the fourth decade followed by 33% patients in the third decade. Only 5% of patients were found in the age group 11 to 20 years and none below 10 years (Table 1). Out of 100 patients, 92% were males and 08% were females, attributing to male preponderance. The male-to-female ratio was approximately 12:1. Majority of the males were in the fourth decade (Table 2). 93% belonged to poor socioeconomic status and 07% to middle-class families. Majority of patients belonged to poor socioeconomic status, according to the modified BG Prasad scale which takes into account per capita monthly income. Out of 100 patients, 77 were smokers, 45 were alcoholics, 17 patients were tobacco chewers and 15 patients did not have an addiction history. Out of 100 patients, 43 patients had a history of intake of spicy food while 57 patients did not give any such history. Out of 100 patients, 10 patients had history of NSAID intake in the past. Out of 100 patients, 35% of patients had O+ve blood group, 35% of patients had B blood group, of which 2% were B-ve and 33% were B+ve. 17% of patients had an A+ve blood group while 13% of patients had an AB+ve blood group. (Table 3). While eliciting chief complaints, all 100 patients had pain abdomen as presenting symptom while 90 of these had vomiting associated with pain whereas the remaining 4 did not have any other associated complaint besides pain abdomen. (Table 4). Intraoperatively, 92 out of 100 patients were found to have pre- pyloric perforation while in 08 patients, the site of perforation was the first part of the duodenum. In all these patients the surface was anterior except in 03 patients where perforation was situated posteriorly. (Table 5). Out of 100 patients, maximum patients i.e. 70 had perforation measuring <1cm in either dimension and 30 patients had size  $\geq 1 \times 1$  cm perforation during intraoperative findings. The largest size observed was 1.5x1.5 cm, which was found in only 01 patient and required FJ intraoperatively. (Table 6). While evaluating the post-op course, 83% of patients, post operatively had a hospital stay of 7 to 10 days, followed by 15% of patients having a hospital stay between 11 to 15 days whereas only 02% of patients had a hospital stay of 16 days. The mean duration of hospital stay was  $9.5 \pm 2.52$ . In this study, 10 patients had wound infections, 07 patients had a chest infection, 07 patients had fever and 03 patients developed post-operative ileus during the postoperative period in the first two weeks (Table 7). A Chi-square test has been conducted to evaluate the association between duration of stay and the number of complications and the result revealed a significant association between the two at a 99% confidence

Table 1: AGE WISE DISTRIBUTION

| AGE GROUP (years) | NO. OF PATIENTS (N=100) | PERCENT |
|-------------------|-------------------------|---------|
| <10               | 0                       | 0%      |
| 11-20             | 5                       | 5%      |
| 21-30             | 33                      | 33%     |
| 31-40             | 62                      | 62%     |

Table 2: GENDER DISTRIBUTION

| GENDER | FREQUENCY | PERCENT |
|--------|-----------|---------|
| Male   | 92        | 92      |
| Female | 08        | 08      |
| Total  | 100       | 100     |

Table 3: Distribution of patients according to blood group.

| Blood Group | No. of Patients | Percent |
|-------------|-----------------|---------|
| A           | 17              | 17      |
| B           | 35              | 35      |
| AB          | 13              | 13      |
| O           | 35              | 35      |
| TOTAL       | 100             | 100     |

TABLE 4: Duration of Symptoms.

| DAYS | No. Of Patients | PERCENTAGE |
|------|-----------------|------------|
| 1    | 53              | 53%        |
| 2    | 37              | 37%        |
| 3    | 07              | 07%        |
| >3   | 03              | 03%        |

Table 5: Distribution of site and surface of perforation.

| PERFORATION                   | No. of Patients | Percent |
|-------------------------------|-----------------|---------|
| Site                          |                 |         |
| Pre- pyloric                  | 92              | 92      |
| 1 <sup>st</sup> part duodenum | 08              | 08      |
| Surface                       |                 |         |
| Anterior                      | 97              | 97      |
| Posterior                     | 03              | 03      |

Table 6: Size of Perforation.

| Size of Perforation(cm) | Frequency | Percent |
|-------------------------|-----------|---------|
| <1x1                    | 70        | 70      |
| $\geq 1 \times 1$       | 30        | 30      |
| Total                   | 100       | 100     |

Table 7: Post-operative Complications.

| COMPLICATIONS   | No. OF PATIENTS | PERCENTAGE |
|-----------------|-----------------|------------|
| SSI             | 10              | 10%        |
| Chest Infection | 07              | 07%        |
| Ileus           | 03              | 03%        |
| Fever           | 07              | 07%        |
| Nil             | 80              | 80%        |

Table 8 : Relation between Hospital Stay and Complication

| Hospital Stay(days) | Complications   |                 |       |
|---------------------|-----------------|-----------------|-------|
|                     | Wound Infection | Chest Infection | Fever |
| 7                   | 0               | 0               | 0     |
| 8                   | 0               | 0               | 0     |
| 10                  | 2               | 0               | 1     |
| 12                  | 2               | 1               | 2     |
| >12                 | 6               | 6               | 4     |

Figure : 1



interval (chi-square =36.960,  $p < .001$ ). The hospital stay was directly related to the complications. Patients with an uneventful postoperative period had an average stay of 7 days whereas those with both wound infections and chest infections had a stay of >12 days. (Table 8). Out of 100 patients, 55 patients were positive for helicobacter pylori while 45 patients were tested negative for H pylori on edge biopsy and staining. All patients were given anti-H pylori treatment post-operatively.

## DISCUSSION:

Peptic ulcer perforation is considered to be a common cause of morbidity and mortality worldwide, especially in underdeveloped countries like India. It is observed to be one of them common abdominal emergencies in surgical practice resulting in peritonitis if left untreated and invariably proves to be fatal. The undesirable outcome is multi-factorial depending on various factors like co-morbid condition, chronic medications like NSAIDs, any underlying pathology, the interval between perforation and surgery and the patient's age. The profile of 100 patients studied revealed that the mean age in this series was 32.2 years with a standard deviation of 6.48. The youngest patient was 17 years old and the oldest was 40 years old which was the upper limit in this study. The highest incidence (62%) was recorded in the age group 31-40 years. This was by a study by Dongo AE et al where the mean age of duodenal perforation was 37.75.[5] Another study on the clinical profile and outcome of perforated peptic ulcers in Tanzania by Chaya PL reported peak incidence during 4th decade(31-40 years).[6] Man-Chin Hua et al in their study on a perforated peptic ulcer in children found the mean age of presentation 14.2 years where 47 out of 52 patients were adolescents and upper limit was taken to be 18 years in their study.[7] Bansod et al reported that majority of PUD occur in ages between 21-50 years.[8] Zelalem Asefa et al in their study on perforated peptic ulcer disease in Zewditu hospital reported the mean age being 31.5 years.[9] Girish S. Noola et al in their study of the epidemiology of perforated peptic ulcer disease found that highest incidence occurred in 40-49 years of age (25%) followed by 20 –29 years (21.67%), 30 – 39years (20%) and 50 –59 years (15%). In this study, out of 100 patients, 92 were males and 8 were females.[10] Males dominated the series in this study and male: female ratio was around 12:1. Majority of the males were in the age group of the fourth decade, showing that incidence increases with age. In contrast to this, Memon AA et al in their study found that out of 86 patients, 81 were males and only 5 patients were females with a male to female ratio of 16.2:1.

[11] A. Dodiya- Manuel and Wichendu PN in their study on presentation and management of perforated peptic ulcer disease, evaluated 36 patients consisting of 28 males and 8 females with a male to female ratio of 3.5:1.

[12] In this study, out of 100 patients, 77 were cigarette smokers, 45 patients were alcoholics, 18 patients gave a history of tobacco chewing while 52 patients had more than one addiction and 15 patients had no addiction history. Fawaz Chikh Torab et al in their study found smoking to be a common risk factor for peptic ulcer perforation. [13] Gujar N et al in their prospective study involving 50 patients with perforated duodenal ulcers found 90% of patients had a positive history of tobacco use and 58% were alcoholics. [14] Raikar R N et al in their study of 120 cases of duodenal perforation done between 2009 and 2011 found 31.7% of patients were smokers and 10.8% were alcoholics. In this study, out of 100 patients, only 10 patients had a history of intake of NSAIDs in the past. [15] Koo Jarley et al found an increase in the incidence of duodenal ulcer perforations which they concluded to be due to increased use of non-steroidal anti-inflammatory drugs mainly in the elderly which was in contrast to our study where NSAIDs were not the predominant risk factor in our study. [16] This could be due to the younger age group in our study. Fawaz Chikh Torab et al found the use of non-steroidal anti-inflammatory drugs (NSAIDs) as a risk factor for perforation. [15] Raikar R N et al in a study involving 120 cases of duodenal perforation concluded that the use of NSAIDs was a common risk factor for duodenal perforations. [15] Long-term NSAIDs use is common in the elderly for the care of Osteoarthritis. In this study, 35% of patients had O+ve blood group, 35% had blood group B of which 33% were B+ve while 2% had B-ve blood group, 13% had AB+ve blood group and 17% patients had A+ve blood group. Oluwole G. Ajao in his study found that perforated duodenal ulcer was more common in people with blood group O. [17] Dr. Murtaza A Calcuttawala, et al in their study observed that the O+ve blood group was the most common blood group in peptic ulcer perforation. [18] In this study, out of 100 patients, 85 patients belonged to poor socioeconomic status and 15 belonged to middle-class families. The majority of patients belonged to poor socioeconomic status. In a study conducted by Gabriel R Nzarubara, it was observed that lower socio-economic group and a crowded and unsanitary living environment predisposes to a high incidence of peptic ulcer disease and subsequent perforation. [19] Moshe Schein in his study also concluded that perforated peptic ulcers are more common in socioeconomically disadvantaged populations worldwide. [20] In this study, out of 40 patients, 92 patients had prepyloric perforation whereas in the remaining 8, the site of perforation was the first part of the duodenum, all 8 being male patients, with gastric to duodenal ulcer ratio of 11.5:1. In all these cases, perforation was situated on anterior aspect except in one patient where perforation was posterior and prepyloric. This is in contrast to a study in Tanzania by Chalya M. et al which reported a duodenal to gastric ulcer ratio of 12.7:1. [21] A high duodenal to gastric ulcer ratio of 25:1 was also found in a study in Sudan in North Africa by S. Fedail and colleagues. [22] However, a study conducted by Dongo AE et al reported gastric ulcers outnumbering duodenal perforation by a ratio of about 2:1. [5] Another study by K. Thorsen on the epidemiology of PPU reported that gastric ulcers accounted for 112 of 172 (65%) patients in their study. [23] Prepyloric ulcers represented 61 of 112 (54%) cases of gastric ulcers. In our study of 100 cases of peptic ulcer perforations, the majority (70%) were of size <1x1cm (figure 1). In 30% of patients, the size of perforation was  $\geq 1$  cm in either dimension. In only one amongst these, the size was approximately 1.5x1.5cm and was recorded as the largest size in this study. Gupta et al in their experience of 162 patients who underwent emergency laparotomy (Figure 2 and 3) for duodenal ulcer perforations sorted their patients into three groups based on the size of perforations- one group was defined as 'small' perforations (less than 1 cm in diameter),

another 'large' (when the perforation was more than 1 cm but less than 3 cm), and the third 'giant' (when the perforation exceeded 3 cm).[24] The most common postoperative complication observed in our study was wound infection (surgical site infection). It was seen in 10% of cases of perforation. The second common complication was chest infection and fever in 7% of patients each. Three patients developed post-operative ileus. Rest 80 patients had an uneventful post-operative period. In all these patients with complications, hospital stay exceeded 10 days suggesting a direct correlation between a hospital stay and post-operative complications. In the study of Jhobta et al, 251 of 504 cases incurred postoperative complications amounting to nearly 50%. The most common post-operative complication was respiratory (28%), followed closely by wound infection (25%) and septicemia (18%), yselectrolytemia(17%) and acute renal failure in 10% of cases. The overall mortality rate in their study was 10% with septicemia associated with multi-organ system failure being the most common cause of death followed by respiratory complication, acute myocardial infarction and pulmonary oedema in descending order.[25] However, no mortality was reported in our study during the hospital stay and follow-up period of 2 weeks after discharge. In this study, 35% of patients had a hospital stay of 8 days followed by 7 days in 25% of patients, 10 days in 22% of patients, 12 days in 5% of patients, 14 days in 5% of patients, 15 days in 5% patients and in 3% patients hospital stay extended to 16 days. Sawyers John L et al in their study of surgical management of acute perforated duodenal ulcers found an average hospital stay of 11.9 days.[26] Taj MH et al in their study observed a median hospital stay of 9 days.[27] The hospital stay was directly related to the post-operative complication. In this study, edge biopsies were taken from the perforation at the time of surgery. Histopathological examination and staining of the biopsy for detection of *Helicobacter pylori* were done. 55% of biopsies were positive for *Helicobacter pylori* in our study. C Palanivelu et al in their study found that out of 120 patients, 72 patients (60%) were positive for *Helicobacter pylori* infection on edge biopsy of duodenal perforation, which is in close accordance with our study.[28]

## CONCLUSION :

In conclusion, we note that PPU (Perforated Peptic Ulcer), is a common surgical emergency in our set up. Our study shows that young people with PPU have fewer coexisting medical illness, a lower post operative complication rate and a more favorable outcome than elderly patients with PPU. A majority of such perforations are gastric (prepyloric) in nature with a male preponderance. A plain chest radiograph is sufficient to make diagnosis in the classic case of sudden onset epigastric pain. Although *H.pylori* is an established etiological agent for the pathogenesis of PUD, smoking seems to be an important causal factor for ulcer perforation in young. Consumption of spicy food is another equally important risk factor for PUD/PPU in young. Alcohol consumption, tobacco chewing and NSAID intake are other risk factors in decreasing order. Exploratory laparotomy with Cellan Jones repair remains the gold standard surgery. Lethality after ulcer perforation is relatively low in young people who undergo timely surgery, limiting the treatment delay to within 12 hours. Patients should be prescribed P KIT post operatively and advised to avoid smoking, too much spicy food, alcohol use and indiscriminate use of NSAIDs at the time of discharge. Prevention of ulcer perforation can only be obtained through smoking prevention. This is an area that may be of greater importance for ulcer surgery than *H. pylori* eradication.

Figure : 2

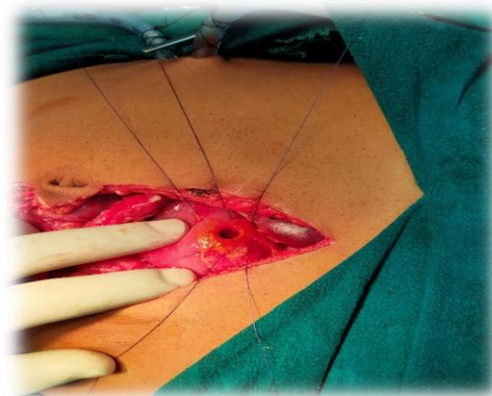


Figure : 3

