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Clinical Study and Management of Peptic Ulcer Perforation in a Tertiary Care Centre

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Original Research Article

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Abstract: Peptic ulcer disease is a medical disease managed mainly by medical treatment including H2 blockers, proton pump inhibitors and antibiotics. With advent of medical therapy and eradication of *Helicobacter pylor*i, the complications have reduced. But perforation of peptic ulcer, a surgical emergency, is still frequently occurring. This is a cross sectional study of patients who were diagnosed, managed and operated for perforated peptic ulcer at Sardar Patel Medical College and Hospital, Bikaner, Rajasthan, from January to August 2018. Data were analysed using a questionnaire proforma, including patient's demographic details, associated premorbid illness, risk factors, site and size of perforation, type of surgical procedure, postoperative complications and mortality. In our study of 58 cases, patients between ages of 30-50 years (44.82%) were commonly affected and there was male predominance (94.82%). Smoking, alcohol consumption and NSAIDs were major risk factors. The significantly related complications were due to co-morbid illness, age and delayed presentation for treatment. On laparotomy gastric perforation was seen in 60.34% cases. 91.37% cases were managed by Graham's omentopexy at laparotomy. Perforated peptic ulcer (PPU) is always a surgical emergency, predominantly affecting middle aged male, may be because of dietary habits (very spicy food) and other risk factors. Surgical intervention is always warranted. Simple closure with omental patch is the standard procedure, followed by medical treatment.
Keywords: Graham's omentopexy, *Helicobacter pylori*, perforated peptic ulcer.

INTRODUCTION

Perforation is defined as break in continuity of the wall of an organ. Peptic ulcer occurs due to mucosal damage secondary to pepsin and gastric acid secretion. It usually occurs in the stomach and proximal duodenum [1]. Perforation occurs when erosion, inflammation, fibrosis create a weak area in the organ and internal pressure causes rupture of organ.

Perforated peptic ulcer is a surgical emergency and is associated with short term mortality and morbidity in up to 30% and 50% of all the cases respectively [2]. The incidence of perforated peptic ulcer is approximately 7-10 per 10000 populations per year [3]. Due to the leakage of gastric and duodenal contents into the peritoneal cavity through the perforated peptic ulcer; chemical peritonitis develops which is further contaminated by bacteria resulting into suppurative peritonitis.

Well known precipitating factors for peptic ulcer are Helicobacter pylori infection, smoking, heavy and chronic alcoholic intake, use of steroids, anti-inflammatory drugs, trauma and gastric malignancies etc. Current use of non-steroidal anti-inflammatory drugs has been associated with 6-8 times increased risk of perforation [4, 5]. Peptic ulcer disease occurs due to defect in endogenous defense mechanism which leads to mucosal functional derangements. These functional defects may be caused by *H. pylori infection*, a gram-negative helix shaped organism. But the role of the *H. pylori* infection in ulcer perforation is uncertain. In a study of patients with acute perforated duodenal ulcer the infection was as common among patients with peptic perforation as among hospital control [6].

Smoking increases acid secretions, decreases prostaglandins and bicarbonate production. It reduces mucosal blood flow and delays the healing of the gastric and duodenal ulcer. However smoking prevalence of 84% has been reported among patients with duodenal ulcer perforation and smoker has three-fold higher mortality from peptic ulcer perforation than non-smoker [7]. The risk factor for peptic ulcer is alcohol. Alcohol is a noxious agent causing gastric mucosal damage. It stimulates acid secretion and increases serum gastrin level also [8]. The complications in peptic ulcer disease range from

bleeding, gastric outlet obstruction to lethal perforation which is the major life-threatening complication. With the introduction of H2 receptor antagonist, proton pump inhibitors and helicobacter pylori eradication in the management of chronic peptic ulcer disease, the rate of definitive surgery for this disease has reduced though the rate of admission for acute perforation has changed little[9]. The frequency of perforated peptic ulcer is decreasing among the overall population but it has increased among old people [10]. The spectrum of this disease in India is different from that of the western world [11]. Lower gastrointestinal perforation is found more in western countries while in India gastro duodenal perforation is the most common site for perforation peritonitis.

Peptic ulcer is a common ailment in northern region of Rajasthan; the reason may be because of spicy foods, smoking, alcohol use, irregular and inadequate treatment for PUD poor literacy rate and delay in seeking treatment. Mikulicz sutured a perforated gastric ulcer for the first time in 1880 and suture is still the most common treatment for ulcer perforation.

Hence this study was performed to assess the demographic distribution of peptic ulcer, to study the clinical presentations of peptic ulcer perforation, to evaluate the site and size of perforation and effective method of treatment, and to note the complications of peptic ulcer perforation and its management.

METHODS

All patients were examined, diagnosed for peptic ulcer perforation and operated for the same in our tertiary care institute, Sardar Patel Medical College and Associated Group of hospitals, Bikaner, Rajasthan. This is a cross-sectional study, which was conducted from January to August 2018. Data were analysed using a questionnaire proforma, including patient's demographic details, associated premorbid illness, previous history of peptic ulcer disease, use of NSAID, cortisone, alcohol and smoking (bidi or cigarette) and time between onset of symptoms and surgery, site and size of perforation, type of surgical procedure, postoperative complications and mortality.

Inclusion criteria

Patients who were diagnosed as peptic ulcer perforation, both gastric and duodenal

Exclusion criteria

The patients with gastric malignancy, traumatic perforation and Gastrinoma, recurrent perforation and stomal ulcer perforation. A detailed history was taken and clinical examination of the patient was carried out at the time of admission with special references to demographic characteristics, risk factors like history of NSAID or alcohol abuse, etc. All required investigations were done along with serum amylase, X-ray chest P.A. view and X-ray abdomen in erect posture. Diagnosis of PPU was made from history and clinical examination. Signs of peritonitis noted. X-ray abdomen in erect posture showed free gas under the dome of diaphragm (Fig 1). The diagnosis of perforation is made clinically and confirmed by presence of free gas under diaphragm which is diagnostic of perforation but absence does not exclude the presence of perforation.

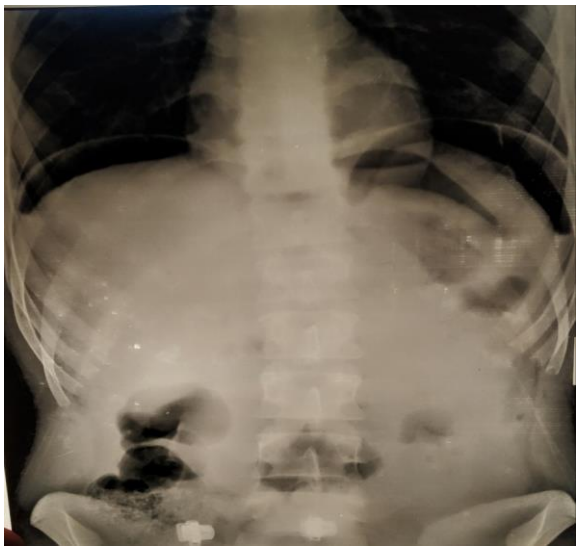

Fig-1: X-Ray Abdomen erect showing air under diaphragm

Many of the patients received initial medical treatment from untrained medical practitioner and only presented to us following a dramatic worsening of their symptoms of peritonitis. After admission the patients were resuscitated by continuous nasogastric suction (rules tube suction), intravenous fluids and intravenous broad spectrum antibiotics and urethral catheterization for urinary output monitoring. After adequate resuscitation, laparotomy under endotracheal general anaesthesia was performed through midline incision.

Patients unfit for surgery were initially treated with abdominal drain under local anaesthesia as a temporary measure prior to definitive laparotomy. During laparotomy perforation was identified, site and size were noted. Simple closure of perforation with nonabsorbable silk suture was done and reinforcement with free or pedicle omental patch (Graham's omental patch repair) was also done (Fig 2).

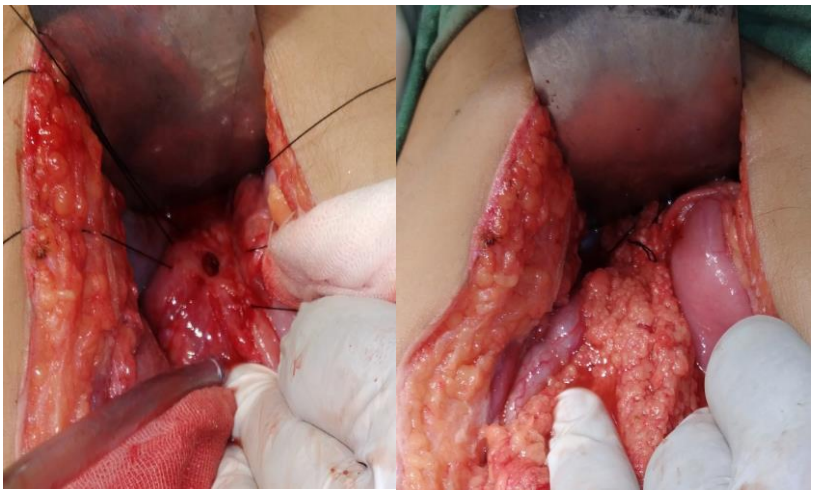

Fig-2: Repair of the perforation by Graham's patch repair.

After the closure of the perforation, peritoneal lavage with copious volume of normal saline is done. After surgery site of perforation, type of surgery, post-operative complications and outcome of treatment were recorded. Patients were followed-up for 30 days. The results were analysed and compared with available published literature in the form of tables.

RESULTS

A total of 58 patients with signs and symptom of perforation due to peptic ulcer were admitted and underwent laparotomy.

Table-1: Sexwise distribution

Sex	Number	Percentage
Male	55	94.82%
Female	3	5.17%

Out of 58 patients, majority was male (94.82%) as shown in table 1. Due to the faulty habits of smoking and alcoholism among males, the incidence of peptic ulcer disease is higher in male.

Table-2: Agewise distribution

Age in years	Number	Percentage
<20	5	8.62%
20-30	13	22.41%
30-50	26	44.82%
50-70	14	24.13%
Total	58	100%

Table 2 shows age wise distribution of the patients. Majority of the patients were in age group of 30-50 years (44.82%) followed by 50-70 (24.13%) and 20-30 years (22.41%) age group. Five patients (8.62%) were younger than 20 years.

Table-3: Distribution by clinical features

S.no	Clinicalfeatures	Number	Percentage
1	Epigastric pain	58	100%
2	Vomiting	45	77.58%
3	Abdominal distension	36	62.06%
4	Constipation	20	34.48%
5	Fever	24	41.37%
6	Shock	9	15.51%
7	Abdominal tenderness, guarding & rigidity	48	82.75%

Epigastric pain was observed in almost all the patients (100%) as shown in table 3. The other most common symptom was vomiting noticed in 45 patients (77.58%) followed by abdominal distension noted in 36 patients (62.06%). Fever was the presenting complaint in 24 patients (41.37%) and 20 (34.48%) had constipation. Nine patients (15.51%) were in shock at admission (Table 3). Abdominal guarding, tenderness and rigidity were observed on clinical examination in 48 patients (82.75%).

Table-4: Distribution according to risk factors

S.no	Risk factors	Number	Percentage
1	Smoking	30	51.72%
2	Alcoholic	14	24.13%
3	Nsaids user	38	65.51%
4	Previous h/o peptic ulcer disease	17	29.31%

Table 4 shows the incidence of risk factors among the patients. Majority of the patients were NSAIDs user (65.51%) followed by smoking observed in 30 patients (51.72%) and 14 cases (24.13%) were alcoholics. Previous history of peptic ulcer disease was noted in 17 cases (29.31%). Among 58 patients 13 (22.41%) were both smoker and alcoholics while 11 (18.96%) were smoker and chronic user of NSAIDs. In two patients no risk factor was identified.

Table-5: Distribution according to associated co morbid illness

S.no	Co morbid illness	Number	Percentage
1	Hypertension	13	22.41%
2	Diabetes mellitus	10	17.24%
3	Obesity	7	12.06%

Hypertension was the commonest co morbid illness observed in 13 patients (22.41%) followed by diabetes (17.24%) and obesity (12.06%) as shown in table 5.

Table-6: Time interval between onset of symptoms and presentation (hours)

S.no	Time interval in hours	Number	Percentage
1	<24 hrs	11	18.96%
2	24-48 hrs	25	43.10%
3	48-72 hrs	12	20.68%
4	>72 hrs	10	17.24%

As shown in table 6, only 11 (18.96%) patients reported in hospital within 24 hours of onset of symptoms while 25 (43.10%) patients admitted within 24 to 48 hours. Ten cases (17.24%) came to hospital after more than 3 days of onset of symptoms.

Among the 58 patients who were operated, 35 (60.34%) had gastric ulcer followed by duodenal ulcer observed in 23 patients (39.65%) (Fig 3).

Table-7: Distribution according to site of perforation

S.no	Site of perforation	Number	Percentage
1	Duodenal	23	39.65%
2	Gastric	35	60.34%

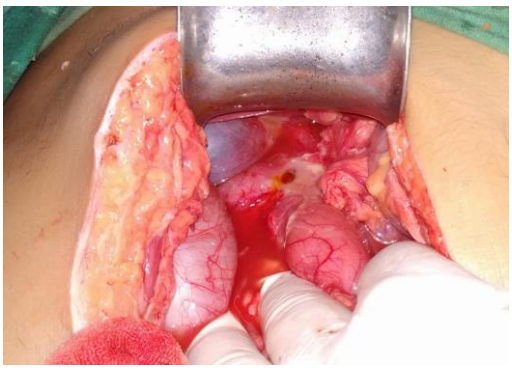

Fig-3: A perforation is seen over the anterior wall of the first part of duodenum.

Table-8: Distribution according to size of perforation

S.no	Size of perforation	Number	Percentage
1	<1cm	53	91.37%
2	>1cm	5	8.62%

As shown in table 8, in majority of the patients the size of perforation was < 1cm (91.37%) and in 5 patients (8.62%) the size was greater than 1cm.

In 91.37% of the patients Graham's patch repair of the perforation was done. In five patients (8.62%) perforation was closed by Modified Graham's patch repair (Table 9).

Table-9: Surgical procedure done

S.no	Type of surgery	Number	Percentage
1	Graham's patch repair	53	91.37%
2	Modified graham's patch repair	5	8.62%

Table-10: Complications of the surgery

S.no	Complications	Number	Percentage
1	Surgical site infection	8	13.79%
2	RTI	2	3.44%
3	ARF	1	1.72%
4	Jaundice	0	0
5	Admission to icu	13	22.41%
6	Mortality	3	5.17%

Complications of the surgery have been shown in Table 10. Surgical site infection was observed in 8 patients (13.79%) while pulmonary infection (3.44%) and acute renal failure (1.72%) were other less common complications. 13 patients (22.41%) were admitted to ICU while three of them (5.17%) expired due to septicemia and multi organ failure.

DISCUSSION

Perforated peptic ulcer is a serious complication of peptic ulcer disease with potential risk of dreaded complications. Most of the patients in our study i.e. 55 patients (94.82%) were male which is similar to other studies [12, 13]. But most of the western studies do not find any significant sex distribution for perforated peptic ulcer [14]. The high incidence of perforated peptic ulcer occur in male in our study may be due to smoking and excessive alcohol consumption among males. Commonest age group of presentation was in 3rd to 5th decade of life. This study is similar to other studies in developing countries but differ from the demographic profile from developed countries where majority of the patient are above 60 years of age [15]. Everett et al in their study of 136 patients observed that two-third of patients in the study belonged to age group 30–60 which is in concordance with the findings of our study [16]. In this study 65.51% patients had a history of ingested NSAIDs. It has been shown that the mean prevalence of *H. pylori* infection in patients with peptic perforation ranges from 65-70% and is significant risk factor for peptic perforation. However, study was unable to determine the presence of *H. pylori* infection in our study because of unavailability of reagent. Only 29.31% of patients in our study had positive past history of chronic PUD which is similar to previous studies [17]. It has been reported that the time from onset of symptom of perforation to definitive treatment is a good indicator of outcomes. In the present study, most of our patients (81%) presented late more than 24 hours from the onset. Everett *et al*. in their study observed that majority of patients (68%) presented within 24 hours of onset of symptoms [16]. Late presentation to the hospital was due to delay in seeking medical treatment, treatment by paramedical staff or quack who failed to diagnose the perforation, delayed referral, etc. Pain in abdomen, vomiting, abdominal distension, fever and constipation were the predominant symptoms in our study. Pain in abdomen was seen in all the cases similar to the findings noted by Jobta RS [11]. In the present study, majority of cases had guarding and rigidity (82.75%) at presentation. Abdominal distension was observed in 62.06% patients. JB Baid and TC Jain found guarding rigidity in 85% cases, abdominal distension in 56% cases similar to our study [18]. All the patients of peptic perforation were treated as an emergency laparotomy. At laparotomy 60.34% patients had gastric perforation [19]. The amount of peritoneal contamination was determined by size of perforation. In our study only five patients had massive perforation with size ≥10mm. The nature of peritoneal exudates is also a determinant of the duration of perforation before surgical intervention. Bilious or serous exudate was seen in patients that presented earlier while patients with a prolonged delay between onset of symptoms and surgical intervention had intra peritoneal frank pus. This was seen in 17.24% of our patients. Operative management consists of simple closure of perforation followed by omentopexy as described by Graham's was done in 91.37% of patients and in 8.62% of the cases closure of perforation

was done by modified graham's patch repair. Definitive ulcer surgery is no longer required in the majority of the patients, as recurrence rates have decreased significantly due to availability of post-operative medical therapy [20, 21]. For gastric ulcer perforations, biopsy is indicated to rule out the malignant perforations [22, 23].

Wound infection was the most common postoperative complication in our study (13.79%). Other complications include pulmonary infection, admission to ICU and death. The reason for these complications was delay between onset of symptoms and presentation, old age and comorbid illness.

The mortality in our study was 5.17% (3 patients). All the three patients were above 60 years age. Age itself has no effect on patient's outcome, but the associated medical illness has a significant detrimental effect. This indicates that higher mortality in old age might be due to associated medical illness. All the three cases had large size gastric perforation. Gastric ulcer perforation was associated with higher mortality and morbidity than the duodenal ulcer perforation in our study which is similar to the earlier published studies [24, 25]. It is also known that the large size of perforation is more likely associated with higher mortality and morbidity due to increased peritoneal contamination [26]. There is no clear cut definition for size of ulcer perforation but generally size less than 2.5cm carries good prognosis by simple closure with omental patch [27].

Mortality and morbidity drastically increases with operative delay of more than 24 hours [28]. Most of our patients were referred from peripheral hospitals of long distance, this itself delayed the treatment. Haemodynamic instability and extensive peritoneal soiling was seen in delayed cases. Jobta R *et al*. reported mortality of 10% that is comparable with this study [11]. The cause of death in our study was septicaemia with multi organ failure.

CONCLUSION

Perforation of peptic ulcer is a surgical emergency which requires awareness and timely management and operation to prevent associated morbidity and mortality. It mostly affects middle aged males in 3rd to 5^{th} decade. Seeking proper medical help in time results in favorable outcome. Simple closure with omental patches i.e. omentpexy give excellent results. Patient should be prescribed treatment for *Helicobacter pylori*, H2 receptor antagonist and PPI which has decreases the risk of peptic ulcer diseases and need of surgery. People should be aware of the common risk factors like too much spicy food, smoking, excess alcohol use, and indiscriminate use of NSAIDs and should be advised to avoid them.

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