

Clinical Presentation and Management of Patients with Peptic Ulcer Perforation in Kashmir - A Prospective Study

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ABSTRACT

BACKGROUND

Around 4 million people are affected by peptic ulcer diseases worldwide annually. The incidence of around 1.5 % to 3 % has been estimated. Peptic ulcer perforation presents with an overall mortality of 10 %. The management is also associated with significant post-operative morbidity and mortality regardless of whether laparoscopic or open repair is performed. In this study, we wanted to find out the incidence of peptic ulcer perforation and its management.

METHODS

Our study was a prospective observational study conducted in post graduate Department of Surgery, Government Medical College Srinagar, from October 2018 to November 2020. All patients were evaluated properly with all baseline investigations followed by X-ray chest and abdomen and ultrasonography (USG).

RESULTS

In our study, 136 patients were diagnosed as cases of peptic ulcer perforation. The maximum number of patients were in age group of 41 - 50 years (27.20 %). The male : female ratio was 14.1 : 1. Abdominal pain was present in all patients as presenting symptom followed by abdominal distension. In this study, 124 patients (91.2 %) had perforation in first part of duodenum, 9 patients (6.6 %) had perforation in prepyloric region and 3 (2.2 %) patients had perforation in body of stomach. Graham's Patch repair was done in 133 patients, 1 patient underwent primary closure, and 2 patients underwent distal gastrectomy with gastrojejunostomy.

CONCLUSIONS

Our study shows that young people with perforated peptic ulcer have fewer co-existing medical illness, a lower complication rate and a more favorable outcome as compared to elderly patients with perforated peptic ulcer. A majority of such perforations are in 1st part of duodenum with male preponderance. A plain chest radiograph is sufficient to make diagnosis in the classic case of sudden onset epigastric pain.

KEYWORDS

Perforation Peritonitis, Management of Peptic Ulcer Perforation, Graham's Repair, Clinical Presentation of Peptic Ulcer Perforation

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BACKGROUND

Peptic ulcer disease (which includes both duodenal and gastric ulcers) affects 4 million people worldwide annually.¹ The incidence has been estimated at around 1.5 % to 3 %.² Peptic ulcer disease is more common in males than females (ratio of 3 : 1).³ Almost 2 - 10 % of peptic ulcer patients perforate and present as serious complication.^{4,5} These patients present with an overall mortality of 10 % although some authors report mortality between 1.3 % and 20 %.⁶ The peptic ulcer disease develops due to disturbance in balance between defensive (mucus-bicarbonate layer, prostaglandins, cellular renovation, and blood flow) and aggressive factors (hydrochloric acid, pepsin, ethanol, bile salts, some medications, etc.).⁷ *Helicobacter pylori* infection and non-steroidal anti-inflammatory drugs (NSAIDs) have been found as the two important causes of peptic ulcer.⁸ *H. pylori* is implicated in 50 to 80 % of duodenal ulcer perforation.⁹ The crack cocaine use has increased the incidence of peptic ulcer perforation by causing ischemia of gastric mucosa. The treatment of these perforations does not require acid reducing definitive surgery. Peptic ulcers can develop in the esophagus, stomach, duodenum, at the margin of a gastroenterostomy, in the jejunum, and in association with a Meckel's diverticulum containing ectopic gastric mucosa. In the developing world, the young male patients predominate and present late and there is a strong association with smoking. In west elderly population is predominantly affected due to ingestion of ulcerogenic drugs.

In 1843, Edward Crisp was the first to report 50 cases of peptic ulcer perforation and accurately summarized the clinical aspects of perforation. The perforation most commonly involves the anterior wall of the duodenum (60 %), although it might occur in antral (20 %) and lesser-curvature gastric ulcers (20 %).² Perforation due to peptic ulcers has been differentiated as acute, subacute or chronic. Subacute type perforations are usually pin point in size, may seal off rapidly and have been further classified as forme fruste, a subtype where symptoms of peritonitis are mild and subside rapidly in contrast to other subvariety where symptoms are of diffuse peritonitis associated with pneumoperitoneum.

Gastric ulcer perforations have a higher associated mortality and a greater morbidity than duodenal ulcer perforation.⁸ The perforation in both organs causes the spread of their contents into the abdominal cavity. Patient presents with pain in whole abdomen with distension followed by vomiting, then signs of peritonitis in later stages. About 5 - 10 % of patients experience shock with a mean arterial pressure of less than 80 mmHg.¹⁰

Three clinical phases in the process of peptic ulcer perforation can be distinguished as:

Phase 1: Chemical peritonitis/contamination. The perforation causes the gastroduodenal acidic contents to leak into peritoneal cavity causing chemical peritonitis.

Phase 2: Intermediate stage. Relief of pain is observed after 6 - 12 hours. This occurs due to the dilution of the irritating gastroduodenal contents by ensuing peritoneal exudates.

Phase 3: Intra-abdominal infection. After 12 - 24 hours of perforation, intra-abdominal infection supervenes.

The various factors associated with poor outcome include advanced age, medical diseases, hypotension and delay in diagnosis and management (greater than 24 hours). Various scoring systems like Boey scoring system and the Mannheim peritonitis index (MPI) have been used for risk stratification of patients and predicting the outcome. Another score devised by Moller et al. called peptic ulcer perforation score (PULP score) assesses and compares its prognostic performance with the American Society of Anaesthesiologists (ASA) and Boey scores.

Prompt diagnosis of peptic ulcer perforation requires a high index of suspicion based on history and clinical examination. The initial investigation of choice is radiograph of the abdomen and chest, to detect the presence of pneumoperitoneum. X-ray chest shows free air under diaphragm in about 75 % of patients of peptic ulcer perforation.¹¹ Erect and left lateral decubitus X-rays have similar diagnostic accuracy, the latter being better tolerated by patients presenting with peritonitis. In the setting of an appropriate history and peritonitis on examination, free air on X-ray is sufficient to justify exploration.¹²

Ultrasonography could be useful as an initial diagnostic test to determine the presence and sometimes the causes of the pneumoperitoneum. With current radiological techniques, 80 - 90 % of cases are correctly diagnosed.¹³ Patients without evidence of pneumoperitoneum on plain chest radiograph, should be subjected to computed tomography scanning with oral contrast. Computed tomography (CT) findings may include intraperitoneal fluid, pneumoperitoneum, mesenteric fat stranding, extravasation of contrast, mesenteric hematoma etc. Computed tomography scan has diagnostic accuracy as high as 98 %.

Various laboratory tests performed in peptic ulcer perforation have no role in establishing diagnosis. They are performed only to rule out alternate diagnosis. They are non-specific. Increased serum amylase may be associated with peptic ulcer perforation and it's usually raised less than four times its normal level. Raised leukocytes and C-reactive protein may be found as a result of inflammation or infection. Derranged renal function tests and metabolic acidosis reflect systemic inflammatory response syndrome (SIRS) and prerenal injury.

Non-operative management of perforated peptic ulcer is attractive as it avoids surgery and its resultant morbidity. The rationale of non-operative management is that, in the case of small perforations, the ulcer seals by omental adhesions and can then heal and the peritonitis does not need operation.¹⁴ The most important factors regarding the feasibility of non-operative management for perforated peptic ulcer are normal vital signs and sealing of perforation as confirmed by a water-soluble contrast study with surgery always indicated if there is a free leak of contrast. Conservative treatment is known as the Taylor's method and consists of nasogastric aspiration, antibiotics, intravenous fluids and *H. pylori* triple therapy.¹⁵

Management of peptic ulcer perforation is primarily surgical and different suture techniques for closure of the

perforation are described. In 1992, Feliciano described five points of decision that the surgeon needs to consider. Those decisions include: (a) Is surgery indicated? (b) Is an omental patch sufficient or a definitive ulcer operation indicated? (c) Is the patient stable enough to undergo a definitive ulcer operation? (d) Which definitive ulcer operation should be done? (e) Should the availability of newer medical options influence the choice of operation? With the development of laparoscopic operation in the past few decades, a sixth decision point is proposed; and (f) should the procedure be performed laparoscopically?¹⁶

Till date many operative techniques have been developed that could be used to manage peptic ulcer perforation. Primary closure of perforation using interrupted sutures, closure by interrupted sutures covered with a pedicle of omentum on top of the repair (Cellan-Jones repair) and plugging the perforation with a free omental plug (Graham patch) are the most common techniques.

Peptic ulcer perforation treatment is associated with a significant post-operative morbidity and mortality regardless of whether laparoscopic or open repair is performed.¹⁷ Post-operative complications have been reported at around 30 %, the commonest post-operative complications were surgical site infections and pneumonia.^{18,19} Mortality after surgery for peptic ulcer perforation is between 6 and 10 %.²⁰ There certain factors which can increase this mortality rate and those include age > 60 years, delayed treatment (24 h), shock at admission (systolic BP < 100 mmHg) and concomitant diseases.^{21,22} Also, gastric ulcers are associated with a two- to threefold increased mortality risk.²³

Objectives

- To determine the incidence of peptic ulcer perforation in a tertiary care hospital.
- To study the management of patients with peptic ulcer perforation.
- To study outcome of patients, in terms of complications, recurrence rate and morbidity / mortality.

METHODS

Our study was a prospective observational study conducted in post graduate Department of Surgery, Government Medical College Srinagar, from October 2018 to November 2021.

Inclusion Criteria

Patients of peptic ulcer perforation above the age of 15 years (both males and females).

Exclusion Criteria

1. Patients below 15 years of age.
2. Patients of polytrauma.

All patients included in study were evaluated properly with all baseline investigations followed by X-ray chest and abdomen, ultrasonography and contrast enhanced computed tomography (CECT) abdomen (when needed). Patients were followed for 6 months after discharge.

Statistical Analysis

Data was described as mean $\pm$ SD.

RESULTS

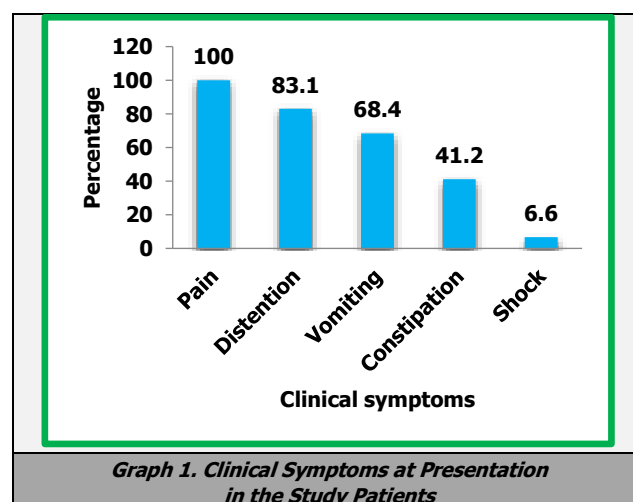
In our study of 2 years from October 2018 to November 2020, total of 74,515 patients were admitted to surgery department. Out of these, 136 patients were diagnosed as cases of peptic ulcer perforation. The maximum number of patients were in age group of 41 - 50 years (27.20 %) followed by 31 - 40 years (21.32 %).

Age (Years)	Number	Percentage
≤ 30	25	18.38
31 - 40	29	21.32
41 - 50	37	27.20
51 - 60	27	19.85
≥ 60	18	13.23
Total	136	100

Table 1. Distribution of Patients Presenting with Peptic Ulcer Perforation

Mean $\pm$ SD (Range) = 44.3 $\pm$ 8.39 (24-70)

There were 127 males and 9 females with male : female ratio of 14.1 : 1. In our study, 106 patients were from rural area (77.9 %) and 30 patients were from urban area (22.1 %). Regarding comorbidities 20 patients (14.7 %) had underlying hypertension, 9 patients (6.6 %) had diabetes mellitus, 5 patients (3.7 %) had hypothyroidism, 4 patients (2.9 %) had chronic obstructive pulmonary disease (COPD), and 2 patients (1.5 %) had chronic kidney diseases (CKD). In our study, 82 patients (60.3 %) were smokers and 54 patients (39.7 %) were non-smokers. History of intake of NSAIDs was present in 14 (10.29 %) patients. In our study, abdominal pain was present in all patients as presenting symptom followed by abdominal distension (83.1 %), vomiting (68.4 %), constipation (41.2 %) and shock (6.6 %).



In our study, 94 patients were presented to hospital after a delay of 1 day, 35 patients after 2 days and 7 patients after a delay of 3 days. The mean duration of delay to hospital was 1.4 ± 0.58 days. Pneumoperitoneum was present in 123 patients (90.4 %) patients and features of peritonitis were present in 128 patients (94.1 %).

In our study, 124 patients (91.2 %) had perforation in first part of duodenum, 9 patients (6.6 %) had perforation in prepyloric region and 3 (2.2 %) patients had perforation in body of stomach. Size of perforation was 0.5 cm in 26 patients, 1 cm in 103 patients and 1.5 cm in 7 patients. Graham's patch repair was done in 133 patients, 1 patient underwent primary closure, and 2 patients underwent distal gastrectomy with gastrojejunostomy.

While evaluating the post-operative course, 116 (85.29 %) patients had a hospital stay of 7 to 10 days followed by 20 (14.7 %) patients having hospital stay between 11 to 15 days. In our study, 41 patients (30.1 %) developed wound infection, 40 patients (29.4 %) developed respiratory infections, 4 patients developed ileus and 2 patients developed acute kidney injury. Two patients died during hospital stay.

Edge biopsy was taken in 30 patients only who had suspicious perforations (gastric ulcer perforations, perforation more than 1 centimetre and age > 60 years) and was sent for histopathological examination. Two patients had histopathological finding of gastric adenocarcinoma who were later subjected to revision surgery. *H pylori* infection was seen in 16 of 30 biopsies.

DISCUSSION

Peptic ulcer perforation continues to be a common cause of morbidity and mortality all over the world especially in underdeveloped and developing nations like India. It is one of the common abdominal emergencies encountered in surgical practice resulting in peritonitis if not treated timely and invariably proves to be fatal. The undesirable outcome is multi-factorial mainly depending on co-morbid condition, underlying pathology, interval between perforation and treatment and patient's age. The present study revealed the incidence of peptic ulcer perforation as 1.82 % per thousand populations. In this study, the profile of 136 patients studied revealed the peak age incidence between 41 - 50 years, followed by 31 - 40 years. This was in accordance with the study by Shah PH et al.²⁴ where the mean age of peptic ulcer perforation was 46.8 years. In our study out of 136 patients, 127 were males and 9 were females.

Males dominated in this study and male to female ratio was 14.1 : 1. Male predominance is attributed to smoking as males are more commonly indulged in smoking as compared to females. Another contributing factor is the life style, as males are frequently outside and ingest spicy food which increases the chances of peptic ulcer disease and peptic ulcer perforation. Aajaz AM et al.²⁵ in their study found that out of 86 patients, 81 were male and 5 were females with a male to female ratio of 16.2 : 1.

In present study, hypertension and diabetes were two common comorbidities, hypertension was present in 20

patients (14.7) and diabetes in 9 patients (6.6). This is in accordance with the study conducted by P.N. Mathur et al.²⁶ In our study, 82 patients (60.3 %) were smokers and 54 (39.7 %) were non-smokers. Torab FC et al.²⁷ in their study found smoking to be a common risk factor for peptic ulcer perforation. Shah PH et al.²⁴ in their study found smoking as risk factor in 40 % of their patients. In our study non-steroidal anti-inflammatory drug use was present in 14 patients (10.29 %). Shah PH et al.²⁴ in their study reported that out of 50 patients, 4 (8 %) patients had history of nonsteroidal anti-inflammatory drug use.

Present study revealed that, abdominal pain was present in all patients as presenting symptom followed by distention (83.1 %), and vomiting (68.4 %). Features of peritonitis were present in 128 patients (94.1 %). This is in accordance with the study conducted by Shah PH et al.²⁴ P.N. Mathur et al.²⁶ in their study, reported that pain abdominal pain was present in 97.3 % followed by distention (83 %) and vomiting (71 %) and features of peritonitis were present in 99 % patients. In this series most patients presented to hospital after delay of one day (69.1 %) followed by two days delay in 25.7 % of patients. The mean duration of delay to hospital was 1.4 ± 5.8 days. P.N. Mathur et al.²⁶ reported that most patients presented within period of 24 – 48 hours. In our study of 136 patients, 123 patients (90.4 %) had gas under diaphragm on chest radiograph. Shah PH et al.²⁴ reported that forty-nine (98.0 %) of the patients in chest radiographs shows free gas under the diaphragm (pneumoperitoneum).

The majority of patients 39 (78 %) presented 48 hours or more after the onset of the symptoms of perforation. Out of 136 patients, 124 patients (91.2 %) had perforation in first part of duodenum and 9 patients had perforation in prepyloric region and 3 had perforation in gastric body. Similar results were found by Shah PH et al.²⁴ In our series of patients, out of 136 patients treated by exploratory laparotomy through midline incision, 133 (97.7 %) patients underwent Graham's patch repair, primary closure was done in 1 patient and distal gastrectomy with gastro-jejunostomy in 2 patients. Similar surgical procedures were performed by Shah PH et al.²⁴ and they reported that the majority of patients, 40 (80 %) had Graham's omental patch of the perforations with either a pedicled omental patch or a free graft of omentum.

Most common post-operative complication in our study was wound site infection which was present in 41 patients (30.1 %), followed by respiratory infection present in 40 patients (29.4 %). Ileus and AKI was found in 2.9 % and 1.5 % patients respectively. In our study 2 patients died during hospital stay, this is attributed to delayed presentation to hospital, both the patients were above 60 years and both were in shock pre-operatively. So, it is concluded that delay in treatment, hemodynamic instability, age, comorbid conditions increase morbidity and mortality in peptic ulcer perforation. In this series of patients, all patients were put on *Helicobacter pylori* kit (HP kit) (Amoxycillin 750 mg + pantoprazole 40 mg + clarithromycin/metronidazole 500 mg) for 14 days and followed up for 6 months to observe any complication like recurrence of peptic ulcer symptoms or peptic ulcer perforation or any wound site complication.

CONCLUSIONS

Our study shows that young people with perforated peptic ulcer have fewer co-existing medical illness, a lower complication rate and a more favorable outcome as compared to elderly patients with perforated peptic ulcer. Majority of such perforations are in 1st part of duodenum with 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 pathogenesis of peptic ulcer disease, smoking seems to be a causal factor of major importance for ulcer perforation in young. Exploratory laparotomy with Graham's patch repair remains the gold standard surgery. Patients should be prescribed with HP kit and advised to avoid smoking and indiscriminate use of non-steroidal anti-inflammatory drugs at the time of discharge.

Data sharing statement provided by the authors is available with the full text of this article at jebmh.com.

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REFERENCES

- [1] Zelickson MS, Bronder CM, Johnson BL, et al. Helicobacter pylori is not the predominant etiology for peptic ulcers requiring operation. *Am Surg* 2011;77(8):1054-1060.
- [2] Zittel TT, Jehle EC, Becker HD. Surgical management of peptic ulcer disease today--indication, technique and outcome. *Langenbecks Arch Surg* 2000;385(2):84-96.
- [3] Buck DL, Andersen VM, Moller MH. Surgical delay is a critical determinant of survival in perforated peptic ulcer. *Br J Surg* 2013;100(8):1045-1049.
- [4] Testini M, Portincasa P, Piccinni G, et al. Significant factors associated with fatal outcome in emergency open surgery for perforated peptic ulcer. *World J Gastroenterol* 2003;9(10):2338-2340.
- [5] Soll AH. Peptic ulcer and its complications. In: Feldman M, Scharschmidt BF, Sleisenger MH, eds. *Sleisenger and Fordtran's gastrointestinal and liver disease: pathophysiology, diagnosis, management*. 6th edn. Philadelphia, PA: W.B. Saunders 1998:620-678.
- [6] Rajesh V, Chandra SS, Smile SR. Risk factors predicting operative mortality in perforated peptic ulcer disease. *Trop Gastroenterol* 2003;24(3):148-150.
- [7] Ramakrishnan K, Salinas RC. Peptic ulcer disease. *Am Fam Physician* 2007;76(7):1005-1012.
- [8] Sivri B. Trends in peptic ulcer pharmacotherapy. *Fundam Clin Pharmacol* 2004;18(1):23-31.
- [9] Gisbert JP, Pajares JM. Helicobacter pylori infection and perforated peptic ulcer prevalence of the infection and role of antimicrobial treatment. *Helicobacter* 2003;8(3):159-167.
- [10] Lagoo S, McMahon RL, Kakihara M, et al. The sixth decision regarding perforated duodenal ulcer. *JSLs* 2002;6(2):359-368.
- [11] Grassi R, Romano S, Pinto A, et al. Gastro-duodenal perforations: conventional plain film, US and CT findings in 166 conservative patients. *Eur J Radiol* 2004;50(1):30-36.
- [12] Soreide K, Thorsen K, Soreide JA. Strategies to improve the outcome of emergency surgery for perforated peptic ulcer. *Br J Surg* 2014;101(1):e51-64.
- [13] Woodring JH, Heiser MJ. Detection of pneumoperitoneum on chest radiographs: comparison of upright lateral and posteroanterior projections. *AJR Am J Roentgenol* 1995;165(1):45-7.
- [14] Donovan AJ, Berne TV, Donovan JA. Perforated duodenal ulcer: an alternative therapeutic plan. *Arch Surg* 1998;133(11):1166-1671.
- [15] Bucher P, Oulhaci W, Morel P, et al. Results of conservative treatment for perforated gastroduodenal ulcers in patients not eligible for surgical repair. *Swiss Med Wkly* 2007;137(23-24):337-340.
- [16] Feliciano DV. Do perforated duodenal ulcers need an acid-decreasing surgical procedure now that omeprazole is available? *Surg Clin North Am* 1992;72(2):369-380.
- [17] Lunevicius R, Morkevicius M. Systematic review comparing laparoscopic and open repair for perforated peptic ulcer. *Br J Surg* 2005;92(10):1195-1207.
- [18] Chalya PL, Mabula JB, Koy M, et al. Clinical profile and outcome of surgical treatment of perforated peptic ulcers in North-western Tanzania: a tertiary hospital experience. *World J Emerg Surg* 2011;6:31.
- [19] Lee FY, Leung KL, Lai BS, et al. Predicting mortality and morbidity of patients operated on for perforated peptic ulcers. *Arch Surg* 2001;136(1):90-94.
- [20] Imhof M, Epstein S, Ohmann C, et al. Duration of survival after peptic ulcer perforation. *World J Surg* 2008;32(3):408-412.
- [21] Zittel TT, Jehle EC, Becker HD. Surgical management of peptic ulcer disease today: indication, technique and outcome. *Langenbecks Arch Surg* 2000;385(2):84-96.
- [22] Sarosi GA Jr, Jaiswal KR, Nwariaku FE, et al. Surgical therapy of peptic ulcers in the 21st century: more common than you think. *Am J Surg* 2005;190:775-779.
- [23] Harbison SP, Dempsey DT. Peptic ulcer disease. *Curr Probl Surg* 2005;42(6):346-354.
- [24] Shah PH, Panchal HA. Acute peptic perforation: clinical profile and our experience with operative outcome. *Int Surg J* 2016;3(4):2227-2232.
- [25] Memon AA, Bhutto AA, Shaikh GS, et al. Changing trend in topography of peptic ulcer perforation. *Journal of Liaquat University of Medical and Health Sciences* 2009;8(1):34-38.
- [26] Mathur PN, Kumawat JL, Joshi CP, et al. Retrospective study of perforated peptic ulcer: surgical emergency. *Int Surg J* 2017;4(1):19-23.
- [27] Torab FC, Amer M, Abu-Zidan FM, et al. Perforated peptic ulcer: different ethnic, climate and fasting risk factors for morbidity in Al-ain medical district, United Arab Emirates. *Asian J Surg* 2009;32(2):95-101.