International Surgery Journal
Shah PH et al. Int Surg J. 2016 Nov;3(4):2227-2232
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: http://dx.doi.org/10.18203/2349-2902.isj20163606

Original Research Article

Acute peptic perforation: clinical profile and our experience with operative outcome

Pratik H. Shah, Hemang A. Panchal*

Department of Surgery, GMERS Medical College and Hospital, Sola, Ahmedabad, Gujarat, India

Received: 30 August 2016
Accepted: 30 September 2016

***Correspondence:**
Dr. Hemang A. Panchal,
E-mail: dr_hapanchal@yahoo.com

ABSTRACT

Background: Perforated peptic ulcer is a serious complication of peptic ulcers with potential risk of grave complications. This study was conducted to evaluate the clinical presentation, management and outcome of patients with peptic ulcer perforation in our setting and to identify predictors of outcome of these patients.
Methods: This was a retrospective study of patients who were operated for perforated peptic ulcers at Sheth V.S. General Hospital, Ahmedabad, Gujarat, India during period of 2003 to 2005. Data were collected using a pretested and coded questionnaire and analyzed.
Results: Out of 50 cases enrolled in the study, 2 were treated by drainage under local anesthesia among them one expired and another one was undergone definite surgery 2 days later, so 49 patients treated by operative line of management. Males (n = 40) out-numbered females (n = 10) by a ratio of 4:1. The highest number in age group was 41-50 years, which are 12 in number. 66% patients were labourers. 32% had past history of acid peptic disease. The use of non-steroidal anti-inflammatory drugs, alcohol and smoking was reported in 8%, 6% and 40% respectively, 14% having alcohol and tobacco consumption, 32% having no other history. 98% showing free gas and 2% doesn't showing free gas on plain erect x ray abdomen in our study. Duodenal (n = 41) to Gastric (n = 8) perforation ratio were 5:1. Graham's omental patch (Graham's omentopexy) of the perforations was performed in 80% of cases. Complication and mortality rates were 36.7% and 2.04% respectively. In follow up n = 20 patients showing mild to moderate abdominal pain.
Conclusions: Perforation of peptic ulcer remains a frequent clinical problem in our environment predominantly affecting 41-50 years group labourer males known to suffer from Peptic ulcer disease. Simple closure with omental patch followed by Helicobacter pylori eradication was effective with excellent results in majority of survivors despite patients' late presentation in our center.

Keywords: Clinical profile, Outcome, Perforated peptic ulcer, Surgical management

INTRODUCTION

Before mid-1950, peptic perforation occurred usually as a culminating event in course of chronic duodenal and gastric ulcer. Peptic ulcer disease (PUD) represents a worldwide health problem because of its high morbidity, mortality and economic loss.[1] Despite this and recent advances in both diagnosis and management of peptic ulcer disease, namely the improvement in endoscopic facilities, eradication of H. pylori and the introduction of the proton pump inhibitors, complications such as peptic ulcer perforation remain a substantial healthcare problem. This may be due to an increase in the risk factors for peptic ulcer complications.[2,3]

Peptic ulcer perforation is a serious complication which affects almost 2-10% of peptic ulcer patients on the average.[4,5] Peptic ulcer perforation presents with an

overall mortality of 10% although some authors report ranges between 1.3% and 20%.[6-8] Being a life threatening complication of peptic ulcer disease, it needs special attention with prompt resuscitation and appropriate surgical management if morbidity and mortality are to be avoided.[2,8]

In the developing world, the patient population is young with male predominance, patients present late, and there is a strong association with smoking.[9] In the west the patients tend to be elderly and there is a high incidence of ulcerogenic drug ingestion.[10] The spillage of duodenal or gastric contents into peritoneal cavity causing abdominal pain, shock, peritonitis, marked tenderness and decreased liver dullness offers little difficulty in diagnosis of perforations.[11] The presence of gas under the diaphragm on plain abdominal erect X-ray is diagnostic in 75% of the cases.[12]

Since the first description of surgery for acute perforated peptic ulcer disease, many techniques have been recommended. The recent advances in antiulcer therapy have shown that simple closure of perforation with omental patch followed by eradication of *H. Pylori* is a simple and safe option in many centers and have changed the old trend of truncal vagotomy and drainage procedures.[13]

A successful outcome is obtained by prompt recognition of the diagnosis, aggressive resuscitation and early institution of surgical management. The aim of this study was to describe our experience on the surgical management of perforated peptic ulcer disease in our local environment outlining the incidence, clinical presentation, management and outcome of patients with peptic ulcer perforation in our setting.

METHODS

This was a retrospective study of patients operated for peptic ulcer perforations at Sheth V. S. General Hospital, Ahmedabad, Gujarat, India during period of 2003 to 2005. The subjects of this study included all patients who were operated for perforated peptic ulcers at Sheth V.S. General Hospital, Ahmedabad, Gujarat, India. Patients with incomplete data were excluded from the study. The details of patients who presented from 2003 to 2005 were retrieved from patient registers kept in the Medical record departments, the surgical wards, and operating theatre & enrolled in the study after signing an informed written consent for the study.

A detailed history and thorough physical examination were followed by investigations like full blood count, blood grouping, serum urea, serum creatinine and random blood sugar. Patients were also screened for HIV infection using rapid test/ELISA test. Radiological investigations like X-ray abdomen erect and chest X-ray were done in all patients on the suspicion of diagnosis of perforated Peptic ulcer disease.

The diagnosis of perforated Peptic ulcer was made from history, plain abdominal and chest radiographs, and confirmed at laparotomy. Patients were put on intra-venous fluids (crystalloids), nasogastric suction, intravenous antibiotics and intravenous anti-ulcer drugs; adequate hydration was indicated by an hourly urine output of 30-50 ml/hour.

After adequate resuscitation, laparotomy was done through midline incision and identified the perforation site. Simple closure of the perforation and or reinforcement with pedicled omental patch (Graham's omentopexy) was done. Thorough peritoneal lavage with 3 to 4 liters of luke warm normal saline was followed by placement of two intraperitoneal drain, one at morrison's pouch & another in pelvis.

Patients kept Nill by mouth upto 4 days, and allowed orally once peristalsis returns. They started orallu initially clear fluid and then soft to solid diet. The drains were removed on successive post-operative days when patient thriving, when each draining less than 30ml. check dressing done on post-operative day 3 and regularly until suture removed.

The operations were performed either by a consultant surgeon or a senior resident under the direct supervision of a consultant surgeon. All the patients were put on triple regime consisting of Amoxicillin (500 mg TID), Metranidazole(400 mg TID) and Omeprazole (20 mg BID), all given orally for 14 days to eradicate H. Pylori, in post-operative period. Patients were followed up on an out-patient basis for up to 12 months after surgery. Depending upon their symptoms at each visit, patients were graded using a modified Visick classification as follows[14]

Grades

- I: No symptoms, excellent results
- II: Mild symptoms, good results
- III: Moderate symptoms, easily controlled by medications
- IV: Severe symptoms, requiring constant medication or re-operation.

Data collection

Data were collected using a preformed questionnaire. variables included in the questionnaire were; patient's demographic data (age, sex), associated medical premorbid illness, duration of illness, previous history of PUD, NSAID use, alcohol use and cigarette smoking, HIV status, timing of surgical treatment, site of perforation, size of perforation, type of surgical procedure, postoperative complication, mortality. The duration of symptoms was defined as the time span between the initial pain perception due to perforation and the operation.

RESULTS

Gender distribution

Total 50 patients of perforated peptic ulcers. An average of 17 cases annually and represented 34% of cases. Of these.Socio-demographic characteristics 40 (80%) were males and females were 10 (20%) with a female ratio of 4: 1.

Table 1: Gender distribution.

Gender	No of patients	Percentage
Male	40	80%
Female	10	20%

Age distribution

The patient's age ranged from 20 to 90 years with a median of 46.6 years.

The peak incidence was in the 5th decade (41-50 years) which are 12 (24%). Most of patients, 31 (62%) had either primary or no formal education and more than three quarter of them were unemployed. Clinical presentation, the duration of symptoms ranged from 1 to 8 days. The median was 2.4 days. 12(24%) presented within twenty-four hours of onset of symptoms, 14 (28%) between 24 and 48 hours and 16 (32%) over 48 hours afterwards. The duration of symptoms was not documented in 8 (16%) patients.

Table 2: Age distribution.

Age group	No. of patients	Percentage
0-10	0	00
11-20	2	04
21-30	9	18
31-40	9	18
41-50	12	24
51-60	9	18
61-70	4	08
71-80	4	08
>80	1	02

Symptoms and signs

The commonest presenting symptoms were sudden onset of severe epigastric pain in 50 (100%), abdominal distention in 11 (22%) and vomiting in 36 (72%) patients.

Abdominal tenderness and classical signs of peritonitis were demonstrable in 50 (100%) and 42 (84%) patients respectively. 27 (54%) patients reported no previous history of treatment for peptic ulcer disease. Patients with a previous history of peptic ulcer disease had had symptoms for durations ranging from six months to 14 years and all of them were not on regular anti-ulcer therapy. No any case was presented with re-perforation.

Table 3: Common symptoms.

Complaints	Percentage
Abdominal pain	100%
Vomitting	72%
Distention	22%
Nausea	10%

Table 4: Common signs.

Sign	Percentage
Tenderness	100
Guarding	96
Rigidity	84
Distention	38
Peristalsis	0

Personal history

Four (8 %) patients reported history of recent ingestion of non-steroidal anti-inflammatory drugs (NSAIDS) for joint and back pains. Other risk factors recorded included alcohol consumption and smoking in 3 (6%) and 20 (40%) patients respectively. Most patients who smoked also took alcohol, their combinations recorded in 7 (14%) patients. In this study, 3 (6 %) patients had associated premorbid illness namely osteoarthritis in 3 patients and hypertension, diabetes mellitus in 1 patient each respectively.

Table 5: Personal history.

Personal history	Percentage of patients
Tobacco	40%
Alcohol	6%
Both	14%
Nsaids	8%

Radiological, operative and histopathological findings

Forty-nine (98.0%) of the patients in chest radiographs shows free gas under the diaphragm (pneumoperitonium). Out of 50 cases 2 were treated by drainage among them one expired and another one was undergone definite surgery 2 days later, so 49 patients treated by operative line of management in this study underwent laparotomy. The majority of patients 39 (78%) presented 48 hours or more after the onset of the symptoms of perforation.

Table 6: Free gas presentation.

Free gas on X-ray	Percentage
Yes	98%
No	02%

During operation, all the cases were opened through midline incision and after opening of the peritoneum, there was expulsion of gas in all cases. Most perforations were located on the duodenum (41, 82%), whereas in the

remaining 8 (16 %) patients had their ulcers located on the stomach at pre-pyloric region. The duodenal to gastric ulcers ratio was 5:1.

All of patients, 49 (98%) had single perforation. The median size of the ulcer was 5.4 mm (2-20 mm). 2 (4%) of the perforations were found to be sealed. Total duodenal (41) perforations, out of 28 (56%) of the perforations were of minimal size (≤5 mm) and 13 (26%) were massive larger than 5 mm. All perforations were found adhered with omentum and the nature of peritoneal fluid was serosanguineous in 17 (34%) patients, bilious in 21 (42%) patients and purulent in 11 (22%) patients. The amount of peritoneal fluid varied from 500 to 1000 mls with a median of 564 mls.

Histological examination of the biopsy specimens revealed no malignancy. All biopsies were not stained for Helicobacter pylori.

Table 7: Size and site of perforation.

Site os perforation	Size of perforation		No of patients
	Up to 5 mm	More than 5 mm	
Duodenal	28	13	41
Gastric	8	Nil	8

Surgical treatment

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 while 3(6%) having simple closure, 5(10%) with simple closure and ligamentum teres repair and 2(4%) having drainage under local anesthesia. Those with sealed perforations had peritoneal lavage with warm saline and mass closure of the abdomen.

Table 8: Surgical methods.

Treatment	Percentage
Simple closure	6
Simple closure + omentopexy	80
Simple closure + ligamentum teres repair	10
Drainage under anesthesia	4

Table 9: Complications.

Complications	No of patients
Pneumonia	4
Pleural effusion	3
Wound infection	5
Septicemia	2
Fecal fistula	1
Bedsore	3
Expired	1

Outcome of treatment

Post-operative complications were recorded in 19 (38%) patients. Of these, surgical site infections and pulmonary complications 5 in each (26%) were the most common post-operative complications.

Follow up of patients

Out of 49 survivors, 35 (70%) patients were followed up for 6 to 12 months after surgery. Depending upon their symptoms at each visit, patients were classified according to Visick grading system as follows[14]:

- Visick grade I, 23(46%) patients
- Visick grade II, 8 (22%) patients
- Visick grade III and IV, 2 (5%) patients each respectively.

DISCUSSION

In this Study, a total of 50 patients were enrolled over a five year period giving an average of 17 cases annually. This figure is similar to what was reported by Schein et al.[15] These differences reflect differences in the rate of risk factors for perforated peptic ulcer disease. The figures in our study may actually be an underestimate and the magnitude of the problem may not be apparent in study.

In the present study, perforated peptic ulcer disease were found to be most common in the fifth decade of life and tended to affect more males than females, with a male to female ratio of 4:1 which is comparable with other studies in developing countries.[2,16-18]

Male predominance in this age group is attributed to both excessive alcohol consumption and smoking among young males which is common in our environment. Alcohol consumption and smoking have been reported to be associated with increased risk for perforated peptic ulcer. Alcohol, as a noxious agent causes gastric mucosal damage, stimulates acid secretion and increases serum gastrin levels and smoking inhibits pancreatic bicarbonate secretion, resulting in increased acidity in the duodenal bulb.[1] It also inhibits the healing of duodenal ulcers.[16,18]

The rate of H. pylori infection in patients with perforated peptic ulcers ranges from 50%-80% and H. pylori infection, as a risk factor for perforated PUD, appears to be more relevant in younger patients. This is in contrast to elderly patients, where NSAIDs may play a more significant etiologic role.[19]

Use of NSAID is an important cause of perforated peptic ulcer in the West. In our series, NSAID use as an offending cause could be attributable in only 8% patients. NSAID inhibit prostaglandin synthesis so further reducing gastric mucosal blood flow.[19]

Patients with no previous diagnosis of peptic ulcer have a higher risk of PUD perforation than patients with a known history of ulcer disease. This may be because preventative measures are more likely to have been taken in patients with a known history of ulcer. Furthermore, these patients are perhaps more likely to seek treatment earlier.

In this study, most of patients had either primary or no formal education and more than three quarter of them were unemployed. Similar occupational pattern was reported by others.[16,17] This observation has an implication on accessibility to health care facilities and awareness of the disease. It has been reported that the interval between perforation and initiation of treatment is a better predictor of outcome. In the present study most of patients presented late more than 24 hours from the start of symptoms.

Hospital treatment is expensive and the patients may seek care only when the pain is unbearable. Patients may take medications in the pre-hospital period with hope that the symptom will abate. It is also possible that some clinicians managing the patients initially may not have considered perforation as a possible diagnosis.

In our study 100% of our patients had classical presentation with sudden onset of sharp epigastric pain. Like ther studies the diagnosis of perforated PUD in this study was made from history and identification of free air under the diaphragm in plain abdominal and chest radiographs, and the diagnosis was confirmed at laparotomy.[2,16,17] Recently, computerized tomography (CT) scans with oral contrast are now considered the reliable method of detecting small pneumoperitonium before surgery and the gold standard for the diagnosis of a perforation.[20,21] Abdominal ultrasonography has also been found to be superior to plan radiographs in the diagnosis of free intra-peritoneal air.[21] None of these imaging studies were used in the diagnosis of free intra-peritoneal air in our study. We relied on plain radiographs of the abdominal/chest to establish the diagnosis of free intraperitoneal air which was demonstrated in 98% of cases.

In our study, duodenal ulcer perforation was the most common type of perforation with a duodenal to gastric ulcer ratio of 5:1.

In this study, Graham's omental patch of the perforations with either a pedicled omental patch or a free graft of omentum was the operation of choice in our centre. Similar surgical treatment pattern was reported in other studies.[2,16,17] This is a rapid, easy and life serving surgical procedure that has been shown to be effective with acceptable mortality and morbidity. Although this procedure has been associated with ulcer recurrence rates of up to 40% in some series, Graham's omental patch of PUD perforations remains a surgical procedure of choice in most centres and to avoid recurrence the procedure should be followed by eradication of *H. pylori.*[17] Definitive surgery is indicated only for those who are reasonably fit and presented early to the hospital for surgery.[17] Definitive peptic ulcer surgery increases operative time, exposes the patient to prolonged anaesthesia and also increases the risk of postoperative complications. This is especially true in developing countries where patients often present late with severe generalized peritonitis.[18]

Overall complications rate in this series was 38% .High complications rate was reported by Javé M et al.[3] This difference in complication rates can be explained by differences in antibiotic coverage, meticulous preoperative care and proper resuscitation of the patients before operation, improved anesthesia and somewhat better hospital environment. In keeping with other studies.[16,17] Surgical site infection was the most common complication. High rate of surgical site infection in the present study may be attributed to contamination of the laparotomy wound during the surgical procedure.

Perforated peptic ulcer is a serious condition with an overall reported mortality of 5%-25%, rising to as high as 50% with age. In this study mortality rate was high in patients who had age >50 years, delayed presentation (>48 hours), shock at admission (systolic BP < 90 mmHg) and concomitant diseases. Also gastric ulcers were associated with an increased mortality risk. However the use of the 'triple regime' produced excellent results in 82.6% of our patients which is comparable to the results from recent studies which have successfully used simple closure followed by eradication of *H. Pylori* as a treatment for perforated peptic ulcer. [2,3,16,17]

Before generalizing the results of our study several important issues need to be addressed. First, since all the subjects in the present study underwent open repair, results from this study may not fully represent those after laparoscopic repair. Second, we did not study the association of *H. pylori* with the postoperative outcomes. Third, data obtained retrospectively. Fourth, since our duration of postoperative follow up was relatively short, we could not estimate the long term effect of Graham's omental patch.

CONCLUSION

Perforation of peptic ulcer remains a frequent clinical problem in our environment predominantly affecting young males not known to suffer from PUD. Simple closure with omental patch followed by Helicobacter pylori eradication was effective with excellent results in majority of cases despite patients' late presentation in our study.

ACKNOWLEDGEMENTS

Authors are grateful to those who were involved in the care of our patients. They would like to thank PHS for

study design, literature search, data analysis and HAP for manuscript writing and editing and submission of the manuscript.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the institutional ethics committee

REFERENCES

1. Türkdoğan MK, Hekim H, Tuncer İ, Aksoy H: The epidemiological and endoscopic aspects of peptic ulcer disease in Van region. Eastern J Med. 1999;4(1):6-9.
2. Elnagib E, Mahadi SE, Mohamed E, Ahmed ME. Perforated peptic ulcer in Khartoum. Khartoum Med J. 2008;1(2):62-4.
3. Jave EE, Sillas CO, Gutiérrez CCA. Factors associated with postoperative complications and mortality in perforated peptic ulcer. Circulation. 2011;79:128-35.
4. Testini M, Portincasa P, Piccinni G, Lissidini G, Pellegrini F, Greco L. Significant factors associated with fatal outcome in emergency open surgery for perforated peptic ulcer. World J Gastroenterol. 2003;9:2338-40.
5. Soll AH. Peptic ulcer and its complications. In Sleisinger and Fordtran's gastrointestinal and liver disease: pathophysiology, diagnosis, management. 6th edition. Edited by: Feldman M, Scharschmidt BF, Sleisenger MH. Philadelphia, PA: W.B. Saunders; 1998:620-678.
6. Rajesh V, Sarathchandra S, Smile SR. Risk factors predicting operative mortality in perforated peptic ulcer disease. Trop Gastroenterol. 2003;24:148-150.
7. Hermansson M, Holstein CS, Zilling T. Surgical approach and prognostic factors after peptic ulcer perforation. Eur J Surg. 1999;165:566-72.
8. Boey J, Choi KY, Alagaratnam TT, Poon A. Risk stratification in perforated duodenal ulcers. a prospective validation of predictive factors. Ann Surg. 1986;205:22-6.
9. Hill AG. The management of perforated peptic ulcer in a resource poor environment. East Afr Med J. 2001;78(8):346-8.
10. Windsor JA, Hill AG. The management of perforated peptic ulcer. N Z Med J. 1995;47-8.
11. Cuschieri A. Disorders of stomach and duodenum. In Essential surgical practice. 4 edition. Edited by: Cuschieri A, Steel RJC, Moosa AR. London: Arnold. 2002:261-319.
12. Mehboob M, Khan JA, Shafiqr R, Saleem SM, Abdul QA. Peptic duodenal perforation-an audit. JCPSP. 2000;10:101-3.
13. Gutierrez L, Pena C, Merquez R, Fakih F, Adame E, Medina J. Simple closure or vagotomy and pyloroplasty for the treatment of a perforated duodenal ulcer comparison of results. Dig Surg. 2000;17:225.
14. Visick AH. Measured radical gastrectomy review of operations for peptic ulcer. Lancet. 1948;1:505-10.
15. Schein M, Saadia R, Decker GA. Perforated peptic ulcer at the J. G. Strijdom Hospital: A retrospective study of 99 patients. S Afr Med J. 1986;70(5):21-3.
16. Nuhu A, Madziga AG, Gali BM. Acute perforated duodenal ulcer in Maiduguri. Internet J Surg. 2009;21:1.
17. Nasio NA, Saidi H. Perforated peptic ulcer disease at Kenyatta National Hospital, Nairobi. East Central African J Surg. 2009;14(1):13-6.
18. Tessema E, Meskel Y, Kotiss B. Perforated peptic ulcer in Tikur Anbessa Hospital. Ethiop Med Journal 2005, 43(1):9-13. 26.
19. Collier DS, Pain JA. Non-steroidal anti-inflammatory drugs and peptic ulcer perforation. Gut. 1985;26:359-63.
20. Amela S, Serif B, Lidija L. Early radiological diagnostics of gastrointestinal infection in the management of peptic ulcer perforation. Radiol Oncol. 2006;40(2):67-72.
21. Chen SC, Yen ZS, Wang HP, Lin FY, Hsu CY, Chen WJ. Ultrasonography is superior to plain radiography in the diagnosis of pneumoperitonium. Br J Surg. 2002;89:351-4.

Cite this article as: Shah PH, Panchal HA. Acute peptic perforation: clinical profile and our experience with operative outcome. Int Surg J 2016;3:2227-32.