Research Article

A prospective study of clinical profile, management and outcome of surgical treatment of perforated peptic ulcer in northern India: a tertiary hospital experience

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Abstract

Introduction: This is a prospective study of patients of adult age group admitted with clinical features suggestive of perforated peptic ulcer. The study comprised of 70 patients. In our study we aimed to provide a complete epidemiological, clinical and management description of Peptic ulcer Perforation in adult age group patients. **Methods:** all the patients who were undergoing exploratory laparotomy were taken. A detailed history, thorough clinical examination and necessary routine blood investigations and X-ray chest and flat plate abdomen in standing position were performed in each case. **Results:** Perforated peptic ulcer is more common in male in the age group 30-50 years and most common presenting symptom was pain abdomen. Smoking and alcohol beverage consumption were risk factors in most cases (78.5%) in causation of perforation. Most common site of ulcer perforation is duodenal 1st part (94.3%). Out of 63 patients in whom perforation size was <=1cm, 10 (15%) were in shock. Whereas 2 were in shock out of 7 patients with perforation size >1 cm. Size of perforation is directly proportional to the quantity of peritoneal fluid. **Conclusion**: Peptic ulcer perforation in present scenario is a disease of relatively younger age group. Rural background, poor socioeconomic status and occupation like farmer and labourer seem to contribute to causation of peptic ulcer perforation. The most important risk factors for the determination of mortality in perforated peptic ulcer disease are duration of perforation (especially if >24 hrs), condition of the patient at the time of presentation, size of perforation as well as preoperative management.

Keywords: Gastric Ulcer, Duodenal Ulcer, Laparotomy, Peptic Ulcer, Perforated Peptic Ulcer, Perforation.

Introduction

Peptic ulcer is one of the most common surgical emergencies. Though lot of work had been done on the etiology of this condition, one specific etiological agent cannot be incriminated in the causation of this particular disease. Since, stress forms the most important single feature in causing peptic ulcer and today's modern life is full of stress and strain, this condition on the increase[1]. In recent years helicobacter pylori infection and NSAIDs have been identified as the two main cause of peptic ulcer [2].

Prompt recognition of this serious condition is very important and only by early diagnosis and treatment it is possible to reduce the still relatively high mortality. With the advent of newer drugs for management of peptic ulcer, the spectrum of presentation and general approach to treatment of the condition has changed considerably. There is decline in incidence of peptic ulcers which is attributed to the era of H2 blockers and proton pump inhibitors, which provides symptomatic relief to patient [3].

Surprisingly, however, the incidence of perforation in peptic ulcer disease has remained relatively constant, probably due to increased inadvertent use of NSAIDS, corticosteroids and because of irregular use of H2 antagonist drugs, therefore although standard of management of peptic ulcer perforation have been

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established, there is need to constantly re-appraise the presentation, clinical features, management option and results.

When acute or chronic duodenal ulcer perforates into the peritoneal cavity, three components require treatment viz., the ulcer, the perforation and the resultant peritonitis. The perforation and resultant peritonitis are immediate threats to the life; the ulcer in itself is not. The therapeutic priorities thus are treatment of peritonitis and securing the closure of perforation, which may be achieved with surgical procedure. In spite of better understanding of disease, effective resuscitation and prompt surgery under modern anaesthesia techniques, there is high morbidity and mortality. Hence, attempt has been made to analyze the various factors, which are affecting the morbidity/mortality of patients with peptic ulcer perforations.

Material and Methods

It is a prospective study of patients with perforated peptic ulcer admitted in R.N.T medical college, M.B.G hospital Udaipur with in a time span of 3 years Patient from August 2011 to February 2014 from both sexes of various age groups having perforation in peptic ulcer disease and who were undergoing exploratory laparotomy were taken. A detailed history, thorough clinical examination and necessary investigations were performed in each case. The data entered in a Performa which also includes demographic, socio-economic data of the patients, course in hospital and follow up of the patient.

Clinical history regarding fever, pain vomiting, abdominal distension, drug history, any treatment prior the admission were taken. Vital signs, hydration, abdominal distension, tenderness, guarding, rigidity, free fluid in peritoneum cavity noted through clinical examination. Systemic examination of cardiovascular system, respiratory system, central nervous system was done.

All patients in the study group underwent investigations in the form of Hb, TLC, DLC, BT, CT Blood sugar, S. Urea , Creatinine, S. Electrolytes, X-ray chest and flat plate abdomen in standing position, ECG, peritoneal fluid culture and pus culture in case of wound infection.

Cases were resuscitated with IV fluids, antibiotics and vasopressure agents if needed. Most cases received antibiotic regimen compromising of 3rd generation cephalosporin (ceftriaxone), aminoglycosides (amikacin), and antianerobic agents (metronidazole), unless contraindicated. In cases with gross contamination, higher antibiotics (piperacillin-tazobactum) were added. All patients underwent surgery following pre-operative preparation (nil by mouth, Ryle's tube placement, urinary catheterisation, etc)

All laparotomies were performed under general anaesthesia. Mid line laparotomy was performed. Amount and type of peritoneal contamination, number, site and size of perforation were noted. Perforation closure was done with omentoplasty using grahams patch. A standered technique of abdominal exploration was adopted with a little variation as possible. Midline incision, mainly cantered in the epigastrium and extending to near or just below umbilicus was employed, depending upon patient's habitus, extent of peritoneal contamination/adhesions. Etc. Post operatively antibiotics were administered for 5-7 days or as indicated.

Regular ryles tube suction was done. Ryles tube kept for as long as required, based on patients recovery including quantity and quality of Ryles tube aspirate, return of bowel activity, abdominal distension, etc. The period of Ryle's tube placement will be noted. Patient will be orally allowed depending upon factors like return of bowel activity, abdominal distension or otherwise suspicion of or actual leakage from repair site, etc.

Post operative parameters including vital signs, drain outputs, days to return of bowel activity, removal of Ryle's tube, allowing the patient orally, hospital stay as well as investigation results will be recorded.

All data will be collected in a specially designed Performa (Appendix1). From this the relevant data will be tabulated and analysed.

Morbidity and mortality will be assessed in term of type of morbity, management, results of such management, impact on hospital stay or survival of patient, cause of death, etc.

Results

Perforated peptic ulcer is one of the most common surgical emergency. Most common presenting symptom was pain abdomen which was present in all patients followed by distension of abdomen (91.42%), vomiting (80%) and fever (21.42%).Tenderness (100%), rigidity (100%), obliteration of liver dullness (95.7%) were found to be the important signs. Absence of bowel sounds was found to be one of the early sign of perforation peritonitis and was present in all the patients. Smoking and alcohol beverage consumption were risk factors in most cases (78.5%) in causation of perforation of peptic ulcer. Plain x-ray abdomen in erect posture was done in all 70 patients and gas under the diaphragm (pneumopertitoneum) was found in all cases. Perforation of duodenal ulcer at first part of duodenum situated over anterior wall was commonest 94.3%. Out of 63 patients in whom perforation size was <=1cm, 10 (15%) were in shock. Whereas 2 (29%) were in shock out of 7 patients with perforation size >1 cm. Size of perforation is directly proportional to the quantity of peritoneal fluid. Among 70 patients studied, 25 patients developed complications and remaining 45 patients had smooth recovery. Most common postoperative complication was bronchopneumonia in 8 cases.

Most common age group involved was 31 to 50 years. Peptic ulcer perforation was nearly nine times more common in males

Table 1: Analysis of Age incidence according to broader age categorizatio

Age (in years)	No. Of Cases	Expected no.
41 - 50	20	10
others	50	60

p value- 0.0006 and it is statistically significant

Mortality in present series was 11.4% (8 patients) and out of these 8 patients 4 (28.57%) belongs to age group >60 yrs and 4 (7.1%) belongs to age group <=60 yrs. Morbidity and mortality was 17(45.94%) in patients who presented >24 hrs and 8(24.24%) in patients who presented <24 hrs. So time of presentation also affects the recovery of patient. There was no mortality in patients who were in either good or average general condition at the time of admission whereas 66.66% mortality observed in patients who were in poor general condition at the time of admission.

Table 2: Mortality among patients studied versus age of patient's according to categorization <=/> 60 years of age

Age in years	No. Of cases	Mortality
>60	14	4 (28.57%)
<60	56	4 (7.10%)

In the present study, perforated peptic ulcer was found to be more common among farmers (n=31) and labourers (n=13). 44 patients (62.85%) of the patients in the present study belonged to these two class alone.

Table 3: Incidence of peptic ulcer perforation according to occupation of patients

Occupation	No. of patients
Farmer	31 (44.28%)
Labourer	13 (18.57%)
Clerk	1 (1.42%)
Business	15 (21.42%)
Student	2 (2.85%)

General condition of patient depends on time of presentation. 24.32% patients presenting more than 24 hrs after onset of symptoms were in shock whereas only 9.09% of those presenting with in 24 hrs of onset of symptoms were in shock.

Table 4: Condition of patient at the time of admission correlated with presentation after onset of symptoms (broad category)

Duration (in hrs.)	No. of cases	General condition of patient on admission		Percentage of patient
		Good /Average	Shock	Shock
<24	33	30	3	9.09
>24	37	28	9	24.32
	70	58	12	17.14

There was no mortality in patients who were in either good or average general condition at the time of admission whereas 66.66% mortality observed in patients who were in poor general condition at the time of admission.

Table 5: Relation between general condition of the patient at the time of admission and mortality

General condition	Total no. Cases	Mortality
Good/Average	58	0
Shock	12	8

p value <0.0001 and it is statistically significant

Discussion

Peptic ulcer perforation is one of the commonest surgical emergency. Although incidence of peptic ulcer diseases has reduced drastically with advent of proton pump inhibitors like omeprazol and H2 receptor antagonist [3], but incidence of surgery for peptic ulcer perforation has not changed.

Age Incidence: Peptic ulceration is common in the age group of 30-50 years in our study which is a peak active period and this may be due to stress and strain during that period, but age is no bar for perforation to occur.

Table 6: Peak age incidence by various authors

	Peak age in years
Turner (1951) [4]	30 – 40
James et al (1961)[5]	30 – 50
S. B. Mishra et al (1982)[6]	35 – 55
Weinganker[7]	20 – 40
Present series	30 – 50

It can be seen from Table 1 that results of peak age incidence in present series matches with James et al (1961) series.
Sex Incidence: In our studied series 90% were males and 10% were females, and the male- female ratio being 9:1. Perforation is more common in males than females, because males were subjected to more stress and strain of life and female sex hormone offer some security against perforation as claimed by Debakay[8] (1940).

Table 7: Sex incidence by various authors

Authors	Male : female ratio
Jordan P H et al (1976)[9]	8.1 : 1
R.B. Satwakar et al (1978)[3]	9 : 1
S. B. Mishra et al (1982)[6]	49 : 1
J. Boey et al (1982)[5]	6.6 : 1
Primose N. Jhon (Biley Love 2004)	2 : 1
Present series	9 : 1

Occupational Incidence: It is believed that perforation of peptic ulcer occurs in those people who are engaged in heavy

manual labour.Wair (1966) in 1390 cases in Scotland, found highest incidence in fishermen, farm labourers and heavy manual worker. Less than half the number was professional sedentary occupation. In our study, it is noticed that perforations most commonly occurred in the farmer and labourer class who belongs to poor socioeconomic status (on the basis of their annual income) and more so in the rural population, who are manual workers (unskilled workers). Majority of them belonged to the poor working class. The incidence of perforation in urban class was less, because of effective medical treatment and early surgery they seek whenever they suffer from peptic ulcer disease.

Habits: Svanes C and Fevang BT et al [10] Showed that chronic smoking increased the risk of ulcer perforation to 10-fold in the age group of 15-74 years, and there was highly significant dose-response relationship. The results were similar in men and women and for gastric and duodenal ulcer perforation. They concluded that smoking is a casual factor for ulcer perforation and accounts for a major part of ulcer perforations in the population aged > 75 years. In our study 55 patients out of 70 patients were smokers and alcoholic.

Chronicity of disease and perforation: In the present study, history of chronic peptic ulcer was present in 45 cases, indicating that the perforation was common in chronic peptic ulcer cases.

Table 8: Incidence of perforation in acute and chronic ulcer by various authors

Authors	Acute ulcer	Chronic ulcer
J Boey et al[5]	28	72
RM Watkins[11]	65	35
Cassel et al[12]	28	72
Present series	35.7	64.3

Duration of symptom before presentation to hospital: In present series mortality of patients in whom time interval between onset of acute symptoms and surgery was less than or equal to 24 hours –mortality rate is 3.33% and if more than 24hours, the mortality rate is 18.9%. So the interval between the time of perforation and surgery has a very strong significance in deciding the mode of treatment. Most of our patients are from rural area, probably be the reason for the delay.

Table 9: Duration of symptoms before presentation to hospital

Duration (in hours)	De Bakey Series (1940)[8]	Bharati C Ramesh et al	
0 – 6	50.83%	12.00%	12.85%
6- 12	13.02%	12%	17.15%
12 – 24	4.73%	24%	17.15%
>24	13.60%	64.00%	52.85%

Tsugawa K et al[14] reviewed that three risk factors: pre-operative shock, delay to surgery over 24 hours and medical illness, was shown by the progressive rise in the mortality rate with the increasing number of risk factors (Hepatogastroenterology [14]. Boey John et al [5] revealed concurrent medical illness, pre-operative shock and delayed operation (>48hours) as significant risk factors that increase mortality in patients with perforated duodenal ulcers (1982)[15]. In the present study we reported that age, site of perforation, size of perforation, duration of perforation, pre-operative shock are the risk factors for the outcome of perforated peptic ulcer. In the presence of contamination, late exploration (after 48hours) carried a high mortality i.e. 50% (Boey John et al6, 1982)[15]. Bharti C Ramesh et al [13] reported that 12% of patients reached the hospital within 12 hours, 40% reached hospital within 25-48 hours and 24% after 48 hours [13].In the present series 52.85% patients presented to hospital after 24 hours and the mortality in patients who presented to hospital after 24 hours is found to be 18.9%.

Conclusion

Peptic ulcer perforation in present scenario is a disease of relatively younger age group. Rural background, poor socioeconomic status and occupation like farmer and labourer seem to contribute to causation of peptic ulcer perforation. Mortality rate in our study series was

11.4%. The most important risk factors for the determination of mortality in perforated peptic ulcer disease are duration of perforation (especially if >24 hrs), condition of the patient at the time of presentation, size of perforation as well as preoperative management. Size of perforation has a significant role in prognosis including morbidity and mortality especially when size of perforation is >1 cm. Early diagnosis and prompt management of shock and systemic inflammatory response syndrome is important for better prognosis of patients. Size >1 cm. Early diagnosis and prompt management of shock and systemic inflammatory response syndrome is important for better prognosis of patients.

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