

## Original Research Article

DOI: <http://dx.doi.org/10.18203/2349-2902.isj20200288>

# A study on surgical complications of peptic ulcer disease: a prospective study at a tertiary care center

Anitha Kotha, V. Aswath Kumar\*, Gopinath Kagalipura V.

Department of General Surgery, PES Institute of Medical Sciences and Research, Kuppam, Andhra Pradesh, India

Received: 05 December 2019

Revised: 09 January 2020

Accepted: 13 January 2020

**\*Correspondence:**

Dr. V. Aswath Kumar,  
E-mail: [aswathkumar.sri@gmail.com](mailto:aswathkumar.sri@gmail.com)

**Copyright:** © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

## ABSTRACT

**Background:** Peptic ulcer was defined as a disruption of the mucosal integrity of the abdominal esophagus, stomach, duodenum leading to local defect or excavation due to active inflammation. Hospitalizations for peptic ulcer disease (PUD) have decreased since the advent of specific medical therapy & low tachyphylaxis associated with those drugs. This study aims to evaluate the surgical complications of peptic ulcer disease and tested the hypothesis that despite the decrease in hospitalization for PUD, the incidence of elective surgery for PUD during the recent three decades tends to decrease and in contrast, the frequency of emergency surgical interventions for complications of the PUD has remained consistent.

**Methods:** A total of 60 patients operated for complications of PUD, admitted to PES Institute of Medical Sciences, Kuppam, from January 2018 to September 2019. All data that may be potential predictors concerning complications of PUD were prospectively analyzed.

**Results:** In the present study, the most common complication was perforated peptic ulcer (78.3%) followed by Gastric outlet obstruction (15%) and rest bleeding peptic ulcer.

**Conclusions:** Despite the efficacy of modern medical therapy, decreasing the overall PUD hospitalizations, the volume of procedures to treat complications of PUD has not declined.

**Keywords:** Peptic ulcer disease, Complications of peptic ulcer disease, Peptic ulcer perforation, Simple closure, Omentoplasty

## INTRODUCTION

Peptic ulcers may produce one among the three main complications- hemorrhage, perforation, or obstruction. These can develop without any premonitory symptoms but typically appear as an abrupt change from preexisting dyspepsia.

The history of management of peptic ulcer disease is one of the great stories in the history of general surgery.<sup>1</sup> Medical therapy cures peptic ulcer in the vast majority of cases, therefore in many areas of the world elective surgery for peptic ulcer disease has almost disappeared.<sup>2</sup>

Currently, up to 90% of all ulcer operations are interventions for complications, including hemorrhage, perforation and gastric outlet obstruction.<sup>3</sup> However, the absolute number of elective procedures performed has significantly diminished in recent years.<sup>4</sup> Some believe that the need for emergency surgery has not reduced, probably because of the increasing incidence of NSAID'S associated complications.<sup>2</sup>

This study aims to evaluate the surgical complications of peptic ulcer disease (PUD) and tested the hypothesis that despite the decrease in hospitalization for PUD, the incidence of elective surgery for PUD during the recent

three decades tends to decrease and in contrast, the frequency of emergency surgical interventions for complications of the PUD has remained consistent. So, there is a need to study various risk factors regarding peptic ulcer disease, its complications and its surgical management.

## METHODS

The patients admitted to PES Institute of Medical Sciences, Kuppam with primary diagnosis of complications of peptic ulcer disease like haemorrhage, hollow viscus perforation, gastric outlet obstruction and who underwent surgical management for the above was taken for this prospective study from January 2018 to September 2019 and results were analyzed using Microsoft Excel software.

The patients selected for this study are those who presented with history suggestive of peptic ulcer disease and its complications. Based on detailed history and thorough clinical examination diagnosis of complications were made. These patients were subjected to the required preoperative investigations and taken for emergency or elective surgical management.

During the study period 60 cases with the following inclusion and exclusion criteria were selected for this study and were allocated alternatively to each of the clinical study. A pretested pro-forma was used to collect relevant information from all the selected patients.

### Inclusion criteria

Patients above 18 years of age, patients consented for study and patients presenting with complications of PUD like upper GI bleeding, peptic ulcer perforation and features of gastric outlet obstruction were included.

### Exclusion criteria

Patients with bleeding due to esophageal varices, patients with contraindications for endoscopy during study period like recent myocardial infarction (in <3 months), post-operative states and presence of shock were excluded from the study. In patients with bleeding, the decision regarding type of treatment was taken after considering age of the patient, general condition, number of episodes of haematemesis / malena, presence of shock, previous history of haematemesis and number of blood transfusions required.

In cases where surgical treatment was planned, preoperative correction of fluid and electrolyte imbalance was done, blood was arranged and antibiotics started. Most of the patients with perforation were subjected to emergency laparotomy. Patient with bleeding after failure of endoscopic therapy were taken for emergency

laparotomy and elective surgical intervention for gastric outlet obstruction (GOO).

Post-operatively, patients were put on continuous nasogastric suction, intravenous fluids and broad spectrum antibiotics. Vital signs were monitored. Assessment of intake/output and biochemical parameters was done. Recovery was observed and any complications occurring in postoperative period were noted and treated accordingly. After satisfactory improvement, patients were discharged from the hospital with advice regarding diet, anti-ulcer drugs, *H. pylori* eradication therapy and quitting of smoking/alcohol etc.<sup>12</sup> All the patients were instructed to come for regular follow-up.

### Statistical analysis

All the data was recorded systematically into the pro-forma and was Data were statistically analyzed using Statistical Package of Social Science (SPSS). The results of analysis were discussed and compared with available published literature in the form of tables and charts.

## RESULTS

### Distribution of complications of PUD

Table 1 shows the most common complication in our study was perforated peptic ulcer (78.3%), followed by GOO (15%) and bleeding peptic ulcer (6.7%).

**Table 1: Distribution of complications of peptic ulcer.**

Complications	Frequency	Percentage (%)
<b>Perforation</b>	47	78.3
<b>GOO</b>	9	15.0
<b>Bleeding</b>	4	6.7
<b>Total</b>	60	100

### Age distribution

Out of 19 patients of age <35 years, 17 (89.5%) patients had perforation and 2 (10.5%) had bleeding. Out of 27 patients of age between 36-55 years, 20 (74%) had perforation, 6 (22.2%) had GOO and 1 (3.8%) had bleeding. Among 14 patients of age >55 years, 10 (71.4%) patients had perforation, 3 (21.4%) had GOO and 1 (7.2%) had bleeding.

### Sex distribution

Out of 60 cases, 51 (85%) were males, 9 (15%) were females. Among 47 cases of perforation, 41 (80.4%) were males, 6 (66.7%) were females. Among 9 (15%) cases of gastric outlet obstruction, 7 (13.8%) were males and 2 females. Among 4 cases upper gastro intestinal bleeding, 3 were males and 1 female.

### Socio-economic status

The majority of patients belonged to upper and middle class, which reflects excessive use of alcohol, smoking, spicy food, stress personality.

### Past history of peptic ulcer disease

Table 3 shows out of 47 patients having peptic ulcer perforation, 17 had the previous history of PUD in which 5 patients on regular treatment and 12 were on irregular treatment. In the present study, all the 9 patients with gastric outlet obstruction had the previous history of PUD and all were on irregular treatment. In the present study,

all the 4 patients with bleeding had the previous history of peptic ulcer disease, two were on regular treatment, two on irregular treatment.

### History of NSAIDS and steroid usage

In the present study of 60 patients, 34 patients gave the history of NSAIDs usage and 4 patients gave a history of steroid usage for associated medical and orthopedic problems. Out of 34 patients using NSAIDs 26 (76.4%) had a perforation, 6 (17.6%) had GOO and 2 (6%) had bleeding. Out of 4 patients using steroids, 4 (100%) had a perforation.

**Table 2: Treatment of complications.**

Surgical procedure	Perforation	GOO	Bleeding	Total (%)
	Frequency (%)	Frequency (%)	Frequency (%)	
Simple closure + omentoplasty	47 (100)	-	-	47 (100)
Truncal vagotomy + gastrojejunostomy	-	9 (100)	-	9 (100)
Conservative management	-	-	4 (100)	4 (100)
<b>Total</b>	<b>47</b>	<b>9</b>	<b>4</b>	<b>60 (100)</b>

**Table 3: Past history of PUD.**

Past history of PUD	Perforation		GOO		Bleeding		Total
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	
Present	17	56.7	9	30	4	13.3	30 (50)
Absent	30	100	0	0	0	0	30 (50)
<b>Total</b>	<b>47</b>	<b>78.3</b>	<b>9</b>	<b>15</b>	<b>4</b>	<b>6.7</b>	<b>60 (100)</b>

**Table 4: Postoperative complications.**

Surgical complication	Perforation		GOO		Bleeding		Total
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	
No complication	34	75.6	7	15.6	4	8.8	45 (75)
Consolidation	3	100	0	0	0	0	3 (5)
Wound dehiscence	1	100	0	0	0	0	1 (1.6)
Wound infection	8	80	2	20	0	0	10 (16.8)
Consolidation and wound infection	1	100	0	0	0	0	1 (1.6)
<b>Total</b>	<b>47</b>	<b>78.3</b>	<b>9</b>	<b>15</b>	<b>4</b>	<b>6.7</b>	<b>60 (100)</b>

### Site of perforation

In our study of 47 cases of perforation, the most common site of perforation is the first part of duodenum seen in 33 (70.2%) cases and rest 14 (29.8%) perforations were noted in prepyloric region.

### Postoperative complications

Table 4 shows the majority (45%) of patients in our study recovered without any complications. Out of 60 cases, 10 (16.8%) patients developed wound infection, which was managed with regular dressings and antibiotics according

to the culture and sensitivity of pus swabs from the wound site. About 5% of patients had respiratory tract infections, which are managed by antibiotics. About 1.6% of patients developed wound dehiscence on POD5; for these cases, secondary suturing was done.

## DISCUSSION

Duodenal ulcer perforation is a common surgical emergency in our study. Although the incidence of surgery for peptic ulcer diseases has reduced drastically with the advent of H<sub>2</sub> receptor antagonist, proton pump inhibitors, and *H. pylori* eradication treatment but surgery for perforation has not changed.

The various observations and results of this present series were compared and analyzed with observations and results of previous studies.

### Age distribution

In the present study of 47 patients of perforation, 20 (42.5%) were in the age group 36-55 years. 17 (36.2%) patients were in the age group <35 years, followed by 10 (21.3%) patients were in the age group >55 years. The high incidence in the middle age group is consistent with the findings of Bharti et al.<sup>5</sup> A study done by Seth et al showed a majority of patients belong to the age group 31-40 years.<sup>6</sup>

The probable reason for the higher incidence in the middle age group may be attributed to the higher prevalence of alcohol and smoking habits and stress factors in this group.

In the present study of 9 patients with gastric outlet obstruction, 6 (66.7%) were in the age group 36-55 years. 3 (33.3%) patients were in the age group >55 years. A study was done by Latchu et al where 53.8% of patients belonged to the age group 40-49 years.<sup>7</sup>

Among the 4 patients with bleeding, 2 (50%) were in the age group <35 years, 1 (25%) patient was in the age group 36-55 years, followed by 1 (25%) patient in age group >55 years. Banerjee et al did the studies in 1994, where 60% of patients belonged to the age group 30-50 years.<sup>8</sup>

### Sex distribution

87.3% of patients with perforation in this study were males, and 12.7% were females, which reflects a higher prevalence of peptic ulcer disease in the male population. This finding is consistent with the findings of Banerjee et al and Bharti et al, Seth et al which is depicted in (Table 5).<sup>5,6,8</sup>

77.7% of patients in this study with gastric outlet obstruction were males, and 22.2% were females, which reflect a higher prevalence of peptic ulcer disease in the male population. This finding is consistent with the findings of Clement et al, which showed male to female ratio of 6:1.<sup>9</sup> This higher incidence in males worldwide can

be explained as because of more consumption of gastric irritants by males compared to females.

In the present study, 3 out of 4 patients with bleeding were males, which reflect a higher prevalence of peptic ulcer disease in the male population. The findings correlate with the study done by Banerjee in which 90% were males.<sup>8</sup>

**Table 5: Prevalence of PUD in male population among various studies.**

Authors	Year	Male predominance (%)
Banerjee et al <sup>8</sup>	1994	60
Ramesh et al <sup>5</sup>	1996	96
Seth et al <sup>6</sup>	2016	80.4
Present study	2018-2019	87.3

### Socio-economic status

In the present study majority of patients belonged to the upper and middle class, which reflects excessive use of alcohol, smoking, spicy food, stress personality. The findings are different from the study done by Bharti et al, in which 72% of cases belonged to poor category.<sup>10</sup>

### Past history of peptic ulcer disease

Table 3 shows in the present study, 30 (63.8%) out of 47 cases of Perforation do not have a previous history of peptic ulcer disease. This finding is consistent with the study done by Chalya et al, in which 69% of cases had no previous history of peptic ulcer disease.<sup>11</sup> All the 4 patients with bleeding gave a history of off and on pain in the abdomen, and 2 of them take regular treatment for PUD. The findings are consistent with a study done by Banerjee ST et al in which all patients with upper GI bleeding gave a history of pain.<sup>8</sup>

### Use of NSAIDs and steroids

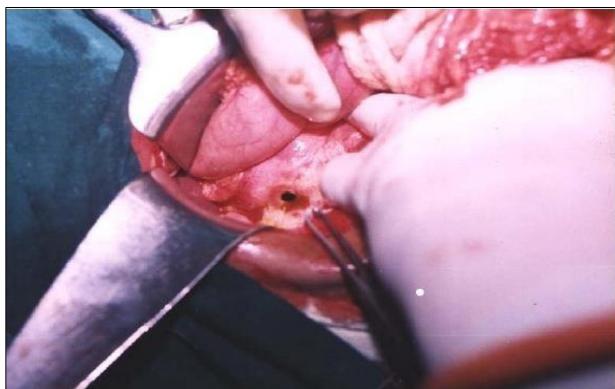
In the present study, 26 out of 47 patients with perforation gave a history of recent use of NSAIDs findings are consistent with the study done by Güzel et al.<sup>13</sup>

2 out of 4 patients with bleeding gave a history of recent use of NSAIDs, Wilcox et al did a study, stated that "more than 50% of patients with upper GI bleeding gave a history of concurrent use of NSAID's, most of which are over the counter medications".<sup>14</sup> The findings conclude that NSAIDs are a precipitating factor for bleeding in peptic ulcers, and their use has increased in recent years due to free availability as over the counter drugs.

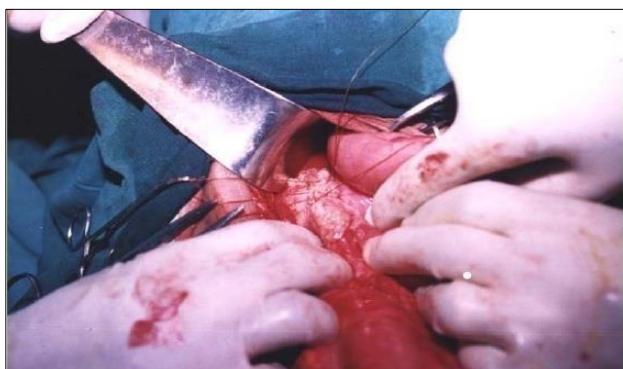
### Personal habits (alcohol and smoking)

In the present study, 15 out of 47 patients with perforation were smokers, out of which seven patients were smokers alone, while eight patients were smokers and alcohol also.

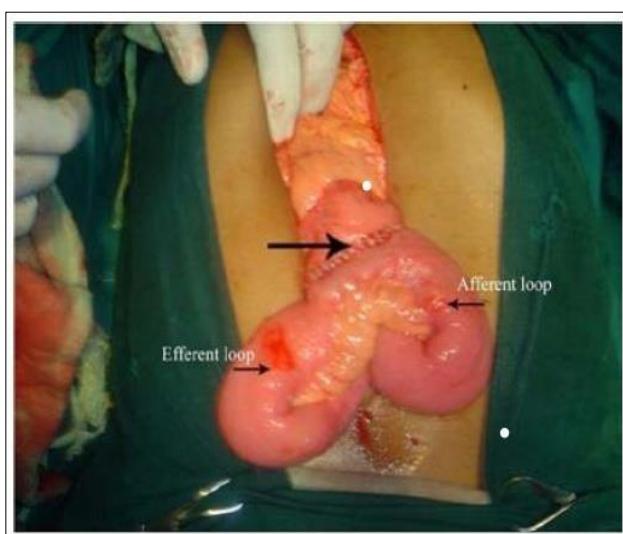
The incidence is somewhat less than previous studies done by Chalya et al.<sup>11</sup> In the present study, 100 % of patients with Gastric outlet obstruction gave a history of both smoking and alcohol intake. In the present study, 100% of patients with bleeding gave a history of both smoking and alcohol intake. This is consistent with the fact that both alcohol and smoking have ulcerogenic effects.



**Figure 1: Perforation in the first part of duodenum.**



**Figure 2: Simple closure and omentopexy.**



**Figure 3: Completed posterior gastrojejunostomy (arrow).**

### **Treatment modalities**

Table 2 shows all the patients with perforation (Figure 1) underwent simple closure reinforced with an omental patch. Mourgugyan and Ramesh et al stated that “simple closure (Figure 2) is the safe emergency procedure in all perforated duodenal ulcer patients.<sup>5,15</sup> 9 patients (100%) with gastric outlet obstruction underwent truncal vagotomy with posterior gastrojejunostomy. A study was done by Latchu et al, in which all patients underwent truncal vagotomy with posterior gastrojejunostomy (Figure 3) with no recurrence rate.<sup>16</sup> All four patients with Bleeding peptic ulcer during my study were managed conservatively. None of the patients had rebleeding.

### **Mortality rate**

In the present study, 1 (2.12%) out of 47 patients with perforation expired after simple closure of perforation. That patient was an elderly female patient with asthma postoperatively, she developed myocardial infarction. That patient had gastric perforation. She presented to the hospital after 48 hours. In the previous study done by Bloom et al the mortality rate 9.6%, respectively.<sup>17</sup> The mortality rate in the present study was a little lower than other studies, probably because the majority of patients came to our hospitals within 24 hours and had less peritoneal contamination.

### **CONCLUSION**

Despite the efficacy of modern medical therapy, decreasing trend of overall PUD hospitalizations the volume of emergency procedures to treat complications of PUD have not declined. In the present study the most common complication was perforated peptic ulcer (78.3%) followed by GOO (15%) and bleeding peptic ulcer (6.7%).

### **ACKNOWLEDGEMENTS**

Authors would like to thanks the surgeons, Dr. Shivananda, Dr. Thinagaran K, Dr. N Srinivasan, Dr. Ashwin K, Dr. Santosh Naik K, Dr. Sandeep Patil for allowing us to collect cases from their units and for their valuable guidance, suggestions, advice, and motivation and making this study possible.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

### **REFERENCES**

1. Ronald F, Martin, MD. Surgical management of ulcer disease. *Surg Clin North Am.* 2005;85:907-29.
2. Towfigh S, Chandler C, Hines OJ, Mcfadden DW. Outcomes from peptic ulcer surgery have not benefited from advances in medical therapy. *Am Surg,* 2002;68:385-9.

3. Jamieson GG. Current status of indications for surgery in peptic ulcer disease. *World J Surg* 2000; 24:256-8.
4. Schwesinger WH, Page CP, Sirinek KR. Operations for peptic ulcer disease: Paradigm lost. *J Gastrointest Surg.* 2001;5:438-43.
5. Ramesh C, Bharti DC, Marwaha, Minhas SS. A comparative study between definitive surgery and simple closure in perforated duodenal ulcer. *Ind J Surg.* 1996;58(10):275-9.
6. Seth S, Agrawal KK. A Review of 51 cases of Duodenal perforation in Rohilkhand region. *Int J Contemp Med Res.* 2016;3(6):1806-8.
7. Mukherjee A, Naveen D. A clinical Study of Peptic Ulcer Disease and its Complications in Rural population. *Sch J App Med Sci.* 2014;2(4E):1484-90.
8. Banerjee ST. Clinical and endoscopic evaluation of gastroduodenal hemorrhage. *Ind J Surg.* 1994;92(7):221-2.
9. Cherukumalli RP, Rao CR. A clinical study of gastric outlet obstruction. *Inter Surg J.* 2016;4(1):264-9.
10. Dodiyi-Manuel A, Wichendu PN, Enebeli VC. Presentation and Management of Perforated Peptic Ulcer Disease in a Tertiary Centre In South South Nigeria. *J West African College Surgeons.* 2015;5:3.
11. Chalya PL, Mabula JB, Koy M, Mcchembe MD, Jaka HM, Kabangila R, et al. Clinical profile and outcome of surgical treatment of perforated peptic ulcers in Northwestern Tanzania: A tertiary hospital experience. *World J Emerg Surg.* 2011 Dec;6(1):31.
12. Marshall BJ, Warren JR. Unidentified curved bacilli in the stomach of patients with gastritis and peptic ulceration. *Lancet.* 1984;1:1311-5.
13. Güzel H, Kahramanca S, Seker D, Ozgehan G, Tunc G, Kucukpinar T, et al. Peptic ulcer complications requiring surgery: what has changed in the last 50 years in Turkey. *Turk J Gastroenterol.* 2014;25:152-5.
14. Wilcox CM. Sholek KA, Cotsonis G. Striking prevalence of over the counter NSAID use in patients with upper gastrointestinal hemorrhage. *Arch Intern Med.* 1994;154:42-6.
15. Mourougayan V, Smile SR, Sibal RN. Morbidity and mortality of definitive surgical procedure in duodenal ulcer perforation. *Ind J Surg,* 1994;56(3):102-8.
16. Clement SH, Cherukumalli RP, Rao CR. A clinical study of gastric outlet obstruction. *Int Surg J.* 2017;4(1):264-9.
17. Bloom BS, Fendrick AM, Ramsey SD. Changes in peptic ulcer and gastritis/duodenitis in Great Britain in 1970-85. *J Clin Gastroenterol.* 1990;12:100-8.
18. Khairnar MR, Wadgave U, Shimpi PV. Updated BG Prasad socioeconomic classification for 2016. *J Indian Assoc Public Health Dent.* 2016;14:469-70.

**Cite this article as:** Kotha A, Kumar VA, Gopinath KV. A study on surgical complications of peptic ulcer disease: a prospective study at a tertiary care center. *Int Surg J* 2020;7:408-13.