

“A clinical profile of perforated duodenal ulcer and its management “

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Abstract

Introduction: Perforation of duodenal and gastric ulcer is by far the commonest surgical emergency needing operations in peptic ulcer disease. Though the incidence of duodenal ulcers is on a decreasing trend, yet perforations still constitute a significant percentage of acute ulcer related surgical emergencies.

Materials and Methods: During the period of study from 1st March 2020 to 28th Feb 2021, 90 Patients admitted with clinical and radiological diagnosis of duodenal perforation, under the Department of Surgery, Gauhati Medical College and Hospital were taken up for the purpose of study. After admission, a detailed history was taken and thorough clinical examination was done and possible immediate investigations were done. Patients who were fit to undergo operative line of management were subjected to surgery and if the peritoneal contamination was less and the gap between onset of pain and admission to hospital was within 24 hours and the patient was young, they were subjected to definitive surgery. If the patient was old, duration of perforation was long and peritoneal contamination was gross, they were treated with simple closure with omental patch.

Results and Observations

Majority (62%) of the patients were of the age group 31-40 years. Majority of the patients (49%) had the blood group O. The incidence of duodenal perforation was highest in the months of July to September (40%) and lowest in the months of January to March (13%). A previous history of Ulcer was present in 56 (62%) patients. Of the 90 patients, 38% had a history of tobacco use, 34% used alcohol, 17% used both tobacco and alcohol. Dehydration was observed in 82 (91%) of the individuals. Guarding or stiffness was found in all subjects. Obliteration of liver dullness was found in 98 percent of the cases. Bowel sounds were not heard in all the patients. Free fluid was detected in 82 (91%) of the individuals.

98 percent of patients had gas under diaphragm on X ray chest and upper abdomen in erect posture. Duodenal ulcer perforation (DUP) was the post-operative diagnosis in 100% of the cases. The first part of the duodenum was found to be the site of perforation in all the cases. Perforation closure with omental patch was performed in 91 percent of the cases, while perforation closure with bilateral truncal vagotomy with gastrojejunostomy was performed in 9 percent of the subjects. There were no postoperative complications in 89 percent of the patients, while 9 percent had wound infection and 2 percent had pneumonitis. The average length of stay for patients with perforation closure with omental patch was 12+/-1 days, while patients with perforation closure with omental patch and bilateral truncal vagotomy with gastrojejunostomy stayed for 11+/-3 days. The difference was shown to be statistically significant ($p < 0.05$). After 6 weeks of follow-up, 70% of the patients had a good outcome and 30% had recurrent abdominal pain. A significant association was discovered between length of stay and age, degree of contamination, and type of procedure conducted, with $p < 0.05$ for each of these characteristics.

Conclusion:

The present study, “A Clinical Profile of Perforated Duodenal Ulcer and its Management” comprising of 90 cases of perforated duodenal ulcer treated in the Dept. of Surgery, Gauhati Medical College and Hospital, Guwahati, has reflected that duodenal ulcer perforation is still one of the common health problems in Assam. Incidence of duodenal ulcer perforation was high in the age group of 31-40 years. It occurred more often in the low socio-economic group and has male preponderance. Anterior wall duodenal ulcer was the commonest site of perforation. Alcohol intake, excessive consumption of analgesics, irregular meals also appeared to be the causative factors. A thorough clinical history, physical examination aided by radiological investigation is the basis for diagnosis of duodenal ulcer perforation. Early diagnosis and treatment helps in the survival of such patients.

Delayed arrival of the patients to the hospital after perforation was directly related to mortality and morbidity. Old age was associated with increased mortality. The present study also shows that simple closure of perforation with omental patch remains by far the standard method of treatment under the prevailing circumstances. In good risk patients, definitive surgery is as safe as simple closure with no added mortality compared to that of simple closure alone.

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I. Introduction

Perforation of duodenal and gastric ulcer is by far the commonest surgical emergency needing operations in peptic ulcer disease. Though the incidence of duodenal ulcers is on a decreasing trend, yet perforations still constitute a significant percentage of acute ulcer related surgical emergencies. In our socio-economic conditions, the relatively high incidence of peptic ulcers can be explained by inaccessibility and inability to procure adequate drugs. Thus perforations are more prevalent among the lower socio-economic group. Owing to the highly efficacious drug therapy for peptic ulcer disease, symptomatic recurrence after repaired peptic perforations seems to be very low. Improvements in anaesthetic techniques and post-operative care have gone a long way in reducing postoperative morbidity & mortality. But wound related complications still remain a common problem. However, there has been a considerable change in the epidemiology of perforated peptic ulcer in resource-rich countries over the last two decades. Previously, most patients were middle aged, with a ratio of 2:1 of male: female. With time, there has been a steady increase in the age of the patients suffering this complication, and an increase in the numbers of females, such that, perforations now occur most commonly in elderly female patients. NSAIDs appear to be responsible for most of these perforations. Delayed presentation of patients from far and difficult areas, results in increased postoperative morbidity & mortality. This is due to a combination of systemic toxemia, fluid and electrolyte imbalances and increased bacterial colonization of the peritoneal fluid. Though, definitive surgical treatment for acute perforations is highly effective in subsequent management of peptic ulcer, yet it has various problems. Increased operative time and surgical expertise are the chief factors making these definitive procedures a difficult task.

AIMS AND OBJECTIVES

1. To study various clinical signs and symptoms, mode of presentation of duodenal ulcer perforation, role of operative management, definitive treatment versus simple closure of perforation.
2. To study various recent trends in the management of perforated duodenal ulcer.
3. To study post-operative complications and mortality of duodenal ulcer perforation.
4. To study the outcome of duodenal ulcer perforation in relation to duration of presentation.

II. Materials And Methods

It is a prospective non-randomized clinical study conducted in Gauhati Medical College and Hospital in the period of 1 year from 1st March, 2020 to 28th February, 2021, wherein, 90 patients with duodenal perforations admitted in Department of Surgery were taken up for the study.

Patient selection: All cases of perforated duodenal ulcers presenting in Deptt. of Surgery, Gauhati Medical College and Hospital (GMCH) who are 12 years of age or more.

Exclusion criteria:

- Patients of gastric perforation.
- Patients of traumatic duodenal perforation.
- Patients of perforation at other areas of intestine.
- Those cases which were initially diagnosed by clinical and radiological examination as duodenal perforation but subsequently proved to be otherwise on exploration, have been excluded.
- Cases of duodenal ulcer in association with other gastrointestinal disorders were excluded from the study as they might influence the long term follow-up.

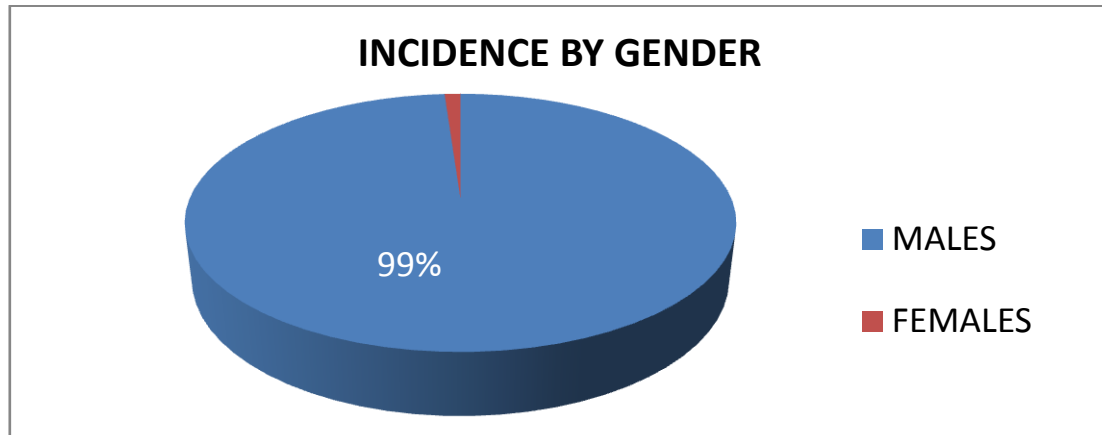
Methods of data collection:

Appropriate investigations like hematological investigations, X-ray chest and abdomen, ultrasonography were done as required in those cases of duodenal perforation. Out of 90 cases admitted, all cases were subjected to emergency laparotomy.

III. Results And Observations

1. Distribution by Gender

Our study population comprised of 90 patients of duodenal perforation out of which 89 patients were male (99 %) and 1 patient was female (1%) .



2. Distribution by Age

Table 1: Distribution by Age

Age	N	%
1-10	0	0%
11-20	2	2%
21-30	7	8%
31-40	56	62%
41-50	18	20%
51-60	5	6%
61-70	1	1%
71-80	1	1%
Grand Total	90	100%

Table 2: Distribution of Blood Group of the patients.

Blood Group	N	%
A	19	21%
B	26	29%
O	44	49%
AB	1	1%
Total	90	100%

Table 3: Distribution of Occupation of patients.

Occupation	N	%
Cultivator	32	36%
Driver	8	9%
Labourer	43	48%
Shopkeeper	7	8%
Grand Total	90	100%

Table 4: Distribution of Symptoms

Symptom	N	%
Pain	90	100%
Abdominal distention	90	100%
Constipation/Diarrhoea	31	34.4%
Fever	90	100%
Nausea and vomiting	90	100%
Previous H/O Ulcer	56	62.2%
Injury: blunt/penetrating	0	0%

Table 5: Distribution of incidence according to month

Month	N	%
Jan-Mar	12	13%
Apr-Jun	18	20%

Jul-Sep	36	40%
Oct-Dec	24	27%
Total	90	100

Table 6: Distribution of duration of arrival of patients to hospital after the onset of symptoms.

Duration in Hours	N	%
6	2	2%
8	33	37%
9	1	1%
10	7	8%
12	23	26%
24	12	13%
48	12	13%
Grand Total	90	100%

Table 7: Distribution of history of Tobacco, Drug or alcohol intake

H/O TOBACCO, DRUG, ALCOHOL INTAKE	N	%
-	10	11%
A	31	34%
T	34	38%
TA	15	17%
Grand Total	90	100%

Table 8: Distribution of Signs

SIGN	N	%
Dehydration	82	91%
Guarding/Rigidity	90	100%
Obliteration of liver dullness	88	98%
Absent bowel sounds	90	100%
Free fluid in peritoneal cavity	82	91%

Table 9: Distribution of preoperative diagnosis

PREOPERATIVE DIAGNOSIS	N	%
HOLLOW VISCUS PERFORATION	90	100%
Grand Total	90	100%

Table 10: Distribution of erect abdomen X-Ray finding.

GAS UNDER DIAPHRAGM	N	%
Absent	2	2%
Present	88	98%
Grand Total	90	100%

Table 11: Distribution of post-operative diagnosis

POSTOPERATIVE DIAGNOSIS	N	%
DUP (Duodenal Ulcer Perforation)	90	100%

Table 12: Distribution of site of perforation

SITE OF PERFORATION	N	%
DIP(1st part of duodenum)	90	100%

Table 13: Distribution of procedure performed.

PROCEDURE	N	%
COP(Closure of perforation)WITH OP (omental Patch)	82	91%
COP WITH OP, B/L TV+GJ (Truncal vagotomy +Gastrojejunostomy)	8	9%
Grand Total	90	100%

Figure1: Distribution of post-operative complications

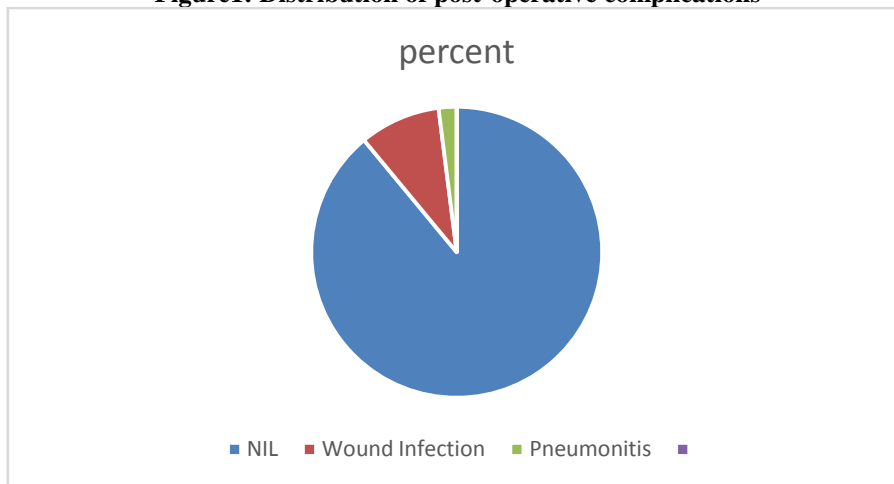


Table 14: Distribution of outcome

Outcome	N	%
EXPIRED	1	1%
RECOVERED	89	99%
Grand Total	90	100%

Table 15: Distribution of length of stay of the patients in hospital.

Procedure	Mean Length of stay (days)	SD	P
COP WITH OP	12	1	0.0038
COP WITH OP, B/L TV+GJ	11	3	
Grand Total	12	1	

The difference was found to statistically significant as $p < 0.05$.

Table 16: Table Follow-up details.

Follow up Period	Good		RAP(Recurrent abdominal Pain)		NAF(not attended follow up)	
	N	%	N	%	N	%
6 Weeks	62	70%	27	30%	0	0%
6 Months	55	62%	5	6%	29	32%

Table 17: Table showing cause of death

Case No.	Age	Time Interval	Procedure	Cause of Death
83	78 Years	12 days	COP with OP	Atelectasis

IV. Discussion

The present study comprised of 90 cases of perforated duodenal ulcer admitted into the surgical wards of Gauhati Medical College & Hospital, Guwahati, over a period of 1 year from 1st March, 2020 to 28th February, 2021.

Age Incidence:

In the present study, the peak incidence was found in the age group of 31-40 years.

Table 18:

AUTHORS	TOTAL NO OF CASES	MEAN AGE INCIDENCE
MACKAY(1954-63)(1)	5383	50.2
LAZARUS(1964)307 (2)	486	46.5
PATOWARY(1970)(3)	24	43.1
BUDHRAAJA(1973)(4)	137	43.5

DEV ET AL(1994)(5)	171	50.5
PLUMMER ET AL(2004)(6)	97	M:49 F:74
PRESENT STUDY	90	35.5

Sex Incidence:

In the present series of 90 cases, 89 patients were male and 1 patient was female.

Table 19:

Study	M:F ratio
Mackay (1966) (1)	6:1
Malhotra, (1965)(7)	10:1
Subnis (1981)	All males
Tanphiphat C et al (1985)(8)	10:1
Lee FY Et Al (2001)(9)	5:1
Plummer et al (2004)(6)	7.3:1

Seasonal Incidence:

In the present study, high incidence was seen in the months of July to September, whereas in other months it was more or less constant. 40 percent cases were found to occur during July to September.

Table 20:

AUTHOR	MONTHS
CEDERBERG (1924)(10)	APRIL TO OCTOBER
YUDIN 1939	APRIL TO OCTOBER
MACKAY (1966)(11)	DECEMBER TO JANUARY
JORDAN ET AL (1974)(12)	JANUARY TO DECEMBER
WYSOCHI ET AL (1999)(13)	MAY TO OCTOBER
PRESENT STUDY	JULY TO SEPTEMBER

Blood Group:

In the present series of 90 patients, 44 (49%) patients belonged to Group O, 26 (29%) patients to group B, 19 (21%) patients to group A and 1(1%) to group AB.

Table 21:

AUTHOR	BLOOD GROUP INCIDENCE (%)			
	O	A	B	AB
RAGHAVAN (1962)(14)	35	25	28	12
CHUTTANI ET AL (1964)(15)	25	22.22	50	2.77
MATHUR ET AL (1969)	43	20	31	6
PRESENT STUDY	49	21	29	1

Other Factors Predisposing To Perforation:

Previous Ulcer Symptoms:

In Present series, 56 patients(62%) had history suggestive of peptic ulcer.

Table 22:

Study	History of peptic ulcer
Watson (1930)(16)	98%
De Bakey (1940)(17)	86.1%
Chalapathi Rao (1981)(18)	100%
Plummer et al (2004) (6)	74%
Present study	62%

Alcohol, Tobacco and Drug Intake:

In the present series, 31 patients (34%) had history of alcohol consumption and 34(38%) gave history of tobacco intake. Both Tobacco and alcohol intake in various forms was found in 15(17%) patients.

Table 23:

Study	
De Bakey (1940)(17)	Alcohol And Tobacco
Svanes C et al (2000)(19)	Alcohol,NSAID
Won Kang(1971)(20)	Alcohol and Tobacco
Shimizu I et al (2000)(21)	NSAID

Site of Perforation:

In the present series, out of the 90 operated cases of duodenal ulcer perforation, all cases had perforation in the anterior wall of the first part of the duodenum.

Table 24

Study	Commonest location of perforation
Tilton (1936)(22)	anterior surface of the stomach or duodenum or near pylorus
Shepherd (1960)(23)	anterior wall of the first part of the duodenum within an inch of pylorus
Gunsheski et al (1990)(24)	duodenal bulb
Parmar et al.(2013)(25)	anterior wall of the first part of the duodenum

Clinical Features:

The clinical features of the patients in the present series more or less conformed to the findings observed by various authors.

Table 25:

Study	Abdominal Pain	Abdominal Distention	peritonitis	Nausea/Vomiting	dehydration	Guarding/Rigidity	Obliteration of liver dullness	Free gas in Peritoneal cavity
Gunsheski et al (1990) (24)	94%		59%					
Ersuno et al (2004)	96%			94%	23%			
Chalya(2011) (26)				36				
De Bakey(17)						87.5%	49.2%	
Anbalakan(2015)(27)	97.6%	76.2%		36.9%				
Olson and Norgore (1946)(28)								80%
Mann et al (1956)(29)								85%
Plummer et al (2004)(6)								80%
Present Study				100				98%

Treatment

Perforated duodenal ulcer with spillage of gastric or duodenal contents into the abdominal cavity remains the most serious complication of duodenal ulcer. It requires early diagnosis and urgent treatment if the patient is to survive.

Conservative Treatment:

In the present series none of the cases were treated conservatively.

Table 26:

AUTHORS	NO OF CASES MANAGED BY CONSERVATIVE MANAGEMENT	MORTALITY RATE
TAYLOR 1946	28	14.30%
VISICK 1946	14	21.40%
STEAD 1951	50	10%
TAYLOR 1951	454	9%
GHOSE 1970	26	38.30%
FENG CAO 2014	107	5%

Operative Treatment:

Simple Closure:

This offers a safe and satisfying method of preventing the leakage of gastric and duodenal juice and whatever food stuff that might be present at the time of perforation. It can be more safely performed by the less experienced surgeons. It has also been reported by various authors that about 35 to 50 percent of the patients with perforated ulcer may not be chronic ulcer patients and will not need further operative treatment following simple closure. In the present study, simple closure of perforation with omental patch was done in 82 patients (91%).

Definitive Surgery:

Immediate definitive surgery was under taken in 8 of the 90 surgically treated patients. Truncal vagotomy with gastrojejunostomy was done in 8 duodenal perforation cases. The patient was selected on the basis of clinical presentation, time of hospitalization and intra-operative findings.

Complications following Surgery:

In the present series post-operative complications occurred in 10 patients. 8 patients had wound infection, 2 patients had pulmonary complication.

In 1940, De Bakey calculated a figure of about 20 percent as representing the incidence of "pulmonary lesions". De Bakey (1940) found that 31.9% of cases had peritonitis as a complication; a fifth of these had localized abscess formation.²⁹ In Chalya's (2011) study of 84 patients, Post-operative complications were recorded in 25 (29.8%) patients. Of these, surgical site infection (48.0%) was the most common post-operative complications (Table 2). The mean age of patients who developed complications was 52.4 ± 16.4 years, whereas the mean age of patients without complications was 32.6 ± 10.2 years. This age difference was statistically significant (P = 0.011).³³⁶

Mortality:

In the present series mortality rate was found to be 1%.

Table 27:

AUTHOR	NO OF CASES OF SIMPLE CLOSURE	MORTALITY RATE
DE BAKEY 1940	15340	23.40%
OLSON AND HARDIN 1957	358	12.10%
SHEPHERD 1960	86	5.80%
GHOSE ET AL 1976	67	12%
DEV ET AL 1994	1354	5%
PRESENT STUDY	82	1%

A comparative study of the mortality rates in patients treated by Simple closure and definitive surgery is shown in the following table:

Table 28:

AUTHORS	SIMPLE CLOSURE	DEFINITIVE SURGERY
DEBAKEY 1940	26%	13.40%
YUDIN 1939	17.80%	8.90%
CHALAPATHI RAO 1981	8%	0
SISTLA 2009	24.1%	16.6%
PRESENT STUDY	1%	0

V. Summary

The present study “A Clinical Profile of Perforated Duodenal Ulcer and its Management” comprised of 90 selected cases of duodenal ulcer perforation admitted to the surgical units of Gauhati Medical College and Hospital from 1st March, 2020 to 28th February, 2021. Available literature regarding historical aspects of perforated duodenal ulcer, its aetiology, incidence, clinical features and treatment has been reviewed. 62 percent were 31-40 years old. Majority of the patients (49%) had the blood group O. Pain was experienced by all patients. The incidence of duodenal perforation was highest in the months of July to September (40%) and lowest in the months of January to March (13%). Distension was seen in 81 (90%) patients. Vomiting was present in 100% of the patients. Constipation/Diarrhoea was found in 31 (34%) of the 90 patients. Fever was present in 100% of the patients. A previous history of Ulcer was present in 56 (62%) patients. Of the 90 patients, 38% had a history of tobacco use, 34% used alcohol, 17% used both. Dehydration was observed in 82 (91%) of the individuals.

Tenderness was found in all patients. Guarding or stiffness was found in all subjects. Obliteration of liver dullness was found in 98 percent of the cases. Bowel sounds were not heard in all the patients. Free fluid was detected in 82 (91%) of the individuals. 98 percent of patients had gas under diaphragm on X ray chest and upper abdomen in erect posture.

Duodenal ulcer perforation (DUP) was the post-operative diagnosis in 100% of the cases. The first part of the duodenum was found to be the site of perforation in all the cases. Perforation closure with omental patch was performed in 91 percent of the cases, while perforation closure with bilateral truncal vagotomy with gastrojejunostomy was performed in 9 percent of the subjects. There were no post-operative complications in 89 percent of the patients, while 9 percent had wound infection and 2 percent had pneumonitis. The average length of stay for patients with perforation closure with omental patch was **12±1 days**, while patients with perforation closure with omental patch and bilateral truncal vagotomy with gastrojejunostomy stayed for **11±3 days**. The difference was shown to be statistically significant (**p<0.05**). Patient No. 83, who was 78 years old, died 12 days after the perforation was closed with an omental patch due to atelectasis. After 6 weeks of follow-up, 70% of the patients had a good outcome and 30% had recurrent abdominal pain. Ninety-nine percent of patients showed up for follow-up. During the period, 1 of the patients expired. At 6 months, outcome of 62 percent of the patients was good, but 32 percent did not show for follow-up. Recurrent abdominal pain was reported by 6% of those who attended follow up. A significant association was discovered between length of stay and age, degree of contamination, and type of procedure conducted, with **p<0.05** for each of these characteristics.

VI. CONCLUSION

The present study has reflected that duodenal ulcer perforation is still one of the common health problems in Assam. Incidence of duodenal ulcer perforation was high in the age group of 31-40 years. It occurred more often in the low socio-economic group and has male preponderance. Anterior wall duodenal ulcer was the commonest site of perforation. Alcohol intake, excessive consumption of analgesics, irregular meals also appeared to be the causative factors. A thorough clinical history, physical examination aided by radiological investigation is the basis for diagnosis of duodenal ulcer perforation. Early diagnosis and treatment helps in the survival of such patients. Old age was associated with increased mortality. The present study also shows that simple closure of perforation with omental patch remains by far the standard method of treatment under the prevailing circumstances. In good risk patients, definitive surgery is as safe as simple closure with no added mortality compared to that of simple closure alone. But it requires proper selection of patients and experienced surgeons.

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