



A Clinical Study of Duodenal Ulcer Perforation

KEYWORDS

Duodenal ulcer, H. Pylori infection

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ABSTRACT Perforation of the duodenal ulcer is one of the common and lethal complications of the duodenal ulcer. Unless the prompt diagnosis is made and early active surgical management is done the mortality is very high, it is the commonest cause of death resulting from surgical abdominal emergency next to intestinal obstruction. 250 cases were studied in this series. Perforation most commonly occurred in the age group of 31 – 40 yrs. youngest patient in this series is 15yrs and oldest is 78yrs. Perforation was more common in winter season. Patients of perforation were usually manual labourers.

AIM OF THE STUDY

- To study the incidence of duodenal perforation in surgical patients in our institute.
- To study the course of treatment depending on the presentation of patient to the hospital.
- To study the follow up period of the patient for further medical (or) surgical management.
- To study the various variables during the course of the disease .
- To study morbidity and mortality associated with each type of treatment.

MATERIAL AND METHODS

Perforation of the duodenal ulcer is one of the common and lethal complications of the duodenal ulcer. Unless the prompt diagnosis is made and early active surgical management is done the mortality is very high, it is the commonest cause of death resulting from surgical abdominal emergency next to intestinal obstruction.

This study was done in ASRAM Medical College, Eluru, from November 2010 to October 2012.

250 cases were studied in this series. The information gathered is mainly from patients and case sheets.

Main modality of treatment for perforated duodenal ulcer in this institution is surgery that is simple closure and omental grafting. This was performed in 237/250 patients.

Emergency Definitive surgery was done in only young stable patients with minimal contamination of peritoneal cavity. Definitive surgery was done in only 10/250 patients.

Those who were with bad general condition and associated medical illness and in shock were taken for conservative management. Only 13 patients were managed conservatively out of 250 patients.

In these entire cases time interval between perforation and surgery was noted. During operation amount of peritoneal fluid and its character was noted. Site, size of perforation, duodenal scarring and fibrosis were noted.

In the post operative period the patients were observed with special reference to the time of oral intake, number of postoperative days and the type of complication were recorded.

After discharge most of the patients came for follow up. Only 181 patients were followed and they were enquired about the symptoms of peptic ulcer. Those who had severe symptoms were subjected to upper GI Endoscopy and biopsy taken for H. Pylori.

Patients who had H. Pylori infection, eradication therapy was advised to them patients and those who had deformed duodenal cap and narrowing, were advised definitive Surgery.

2010	56
2011	110
2012	84

The following table shows year wise incidence of duodenal ulcer perforation.

RESULTS AND OBSERVATIONS

Age Incidence :

Perforation of duodenal ulcer can occur at any age. i.e. from infant to old individuals.

In the study of A.K Dev and S. Paul(10) peak incidence of perforation of duodenal ulcer noted in the age group of 46-55 in another study by P.C. Sood and R.L Gupta(11) peak incidence was noted in the age group of 31 to 40 yrs which is quite in conformity with the opinion expressed by leading authorities who have made observation regarding age incidence of perforation.

The present series of 250 cases which were registered in 2010-2012 are arranged in following table. In the present study youngest patient is 15 years old and oldest is 78 years.

TABLE 1

In the present series maximum number of cases were noted in the age group of 31 – 40 yrs.

Sex Incidence :

Perforation of peptic ulcer is more common in men than in women. The high incidence of male can be explained on the basis of greater hardship, strains, anxiety and indulgence in smoking, alcoholism and intake of NSAID 's. They have to endure in earning the livelihood for their family.

The Following Table Shows Male to Female in the Present Study

TABLE 2

Following Table shows trend in Male to Female ratio compared to present study

TABLE 3**Sex wise distribution of patients
SEASONAL AND MONTHLY INCIDENCE**

Perforations are more common in winter and least common in summer. Bodhe and his Colleagues¹² studied in Poona District concluded that high water vapour pressure and low temperature coincided with periods of high incidence.

Study of Nurex and Martinez showed 28 % in spring 30 % in summer, 17 % in Autumn and 27 % in winter.

In the present study the following table shows month wise incidence from the year 2010 to 2012.

TABLE 4**Month wise distribution of patients
Occupational Incidence :**

Duodenal ulcer perforation is seen to be more common in manual labourers and lower socio economic groups in a study by P.C.Sood and R.L Gupta (11)

In the present study out of 250 cases their occupation tabulated as follows.

TABLE 5**RECURRENT PERFORATION:**

Incidence of recurrent perforation in various studies is around 1% of all admissions of duodenal ulcer perforations. In the present study one case of recurrent perforation was recorded out of 250 cases. That is 0.4%.

RELATIONS TO DRUGS :

The drugs concerned are NSAIDs and corticosteroids. In the present series of 250 cases, history of ingestion of NSAIDs was present in 35 patients (around 14%) and corticosteroids in 11 patients (4.4 %).

PREVIOUS HISTORY OF PEPTIC ULCER :

History of symptoms of peptic ulcer 3 months before the perforation was taken into consideration.

In the study of P.C. Sood and R.L Gupta(11) about 78% of patients were having previous ulcer history. V.Mourougayan(18)noticed 76% of patients having ulcer history.

In the present study 68 % of patients gave history of symptoms of dyspepsia / peptic ulcer before perforation.

TABLE 6**Previous history of dyspepsia
HISTORY OF SMOKING AND ALCOHOLISM: (22)**

In the present study, 42 patients were only smokers, 63

were only alcoholics, and 115 pts were both alcoholic and smokers.

TABLE 7**RELATION TO BLOOD GROUPS:(45)**

Perforation is common in "O" group people (lanAird)¹⁰. In the present series of 250 patients the blood group wise distribution is as follows :

TABLE 8**Blood group distribution of patients
DISCUSSION****CLINICAL FEATURES :**

Mode of onset : Duodenal perforation occurs suddenly, in this series all cases started with sudden and severe agonizing pain in the upper abdomen.

Pain : Excruciating pain is the presenting complaint in all cases. In majority of cases it was started in the epigastric region and gradually spread all over the abdomen. In a few cases pain is reported first in the right iliac fossae.

Shoulder tip pain : This is due to sub-diaphragmatic irritation by gastric contents. This was seen only in 10% of cases.

Vomiting and Nausea :In this study more than 60% of patients complained of vomitings and less than 40% were having nausea at the time of admission.

Hemorrhage :Association with perforation is a very grave complication.

IMPORTANT SIGNS :

Abdominal rigidity and Tenderness : Noted in all the cases.

Obliteration of liver dullness: This is due to collection of free air under the diaphragm. This sign is positive in 62% of cases (P.K. Sen). In this study it is present in 68% of cases.

Shifting dullness :This sign is usually present in late cases. In this series it is present in 60% of cases.

Paracentesisabdominis : It was done only in doubtful cases (when no pneumo peritoneum). A study by I.Narasingarao and B.B Naikreveals that all cases of gastro intestinal perforations gave positive result with 100% accuracy. In this study all cases with outpneumoperitoneum were aspirated purulent peritoneal fluid.

Bowel Sounds: In this study 70% of cases found to have no bowel sounds.

Presence of pneumoperitoneum: This is usually seen in 70-80% of patients . A.K Dev and S.Paul's study(10)showing in 98 % of cases. In present study pneumoperitoneum was present in 96% of cases.

TREATMENT

The protocol we followed in our study for the patients of duodenal perforation is as follows.

Almost all the patients of duodenal perforation were received at casualty. These patients came usually in late stages with shock.

First priority was given to revival of the patients from shock

by giving IV fluids and blood Transfusions. The patients revived from shock were taken for surgical management.

The patients those who could not be revived from shock and those who were in moribund condition due to associated medical illness were taken for conservative management, as these patients are usually unfit for Anaesthesia. In our series out of 250 patients 237 were subjected to surgical management and 13 patients were taken for conservative management.

Conservative Management :

Out of 250 patients, 13 patients were taken for conservative management.

The measures those are followed in our study consist of

1. Nasogastric aspiration.
2. Administration of IV fluids and blood Transfusions .
3. Antibiotics.
4. Keeping bilateral flank drains under local anesthesia among 13 patients treated conservatively, 4 survived and 9 patients succumbed to death.

The patients who survived were of young age group. But these patients have developed the following complications during conservative management after recovery from peritonitis.

2 patients have developed Basal pneumonitis and were treated with antibiotics.

4 patients developed pelvic and subdiaphragmatic abscess. These were drained and the patients recovered.

1 patient developed jaundice during the treatment this patient was HBSAg Positive. Jaundice may be due to septicemia and the patient recovered later.

Out of the 9 patients who died One patient was having fulminant hepatitis due to Hepatitis – B virus infection.

Remaining 3 patients were of old age and 5 patients were having severe COPD.

Total No. of Patients -250

No. of Patients managed conservatively-13

No. of Patients survived - 4

No. of Patients died -9

SURGICAL TREATMENT

Surgery is the main modality of treatment for perforated duodenal ulcer in our study. The type of surgery adopted in our study was simple closure of perforation and omental graft reinforcement.

In present study out of 250 patients, 237 patients were treated surgically. Simple closure of perforation and omental graft was done in 226 patients. Definitive surgery that is Bilateral Truncalvagotomy and gastrojejunostomy was done in 11 patients. The definitive surgery was done in young patients who came to the hospital with in 12 hrs, who did

not present with shock and with minimum peritoneal contamination.

Other definitive surgical procedures like selective vagotomy, highly selective vagotomy and partial gastrectomy were not done for emergencies in this study.

The site of the perforation was anterior wall of the first part of the duodenum in all cases except one case where the perforation is noted in posterior wall of first part of duodenum. The size of perforation varied from 3mm to 2cm in diameter.

Duodenal scarring and fibrosis were noted in 30% of patients. The perforation was closed with 2.0 vicryl or 2.0 chromic catgut, some were closed with 2.0 silk. The peritoneal fluid was collected and sent for culture and sensitivity. Peritoneal toilet was done with normal saline or ringer lactate or peritoneal lavage solution, and sub hepatic and pelvic drains were placed.

POST OPERATIVE COMPLICATIONS

1. Pulmonary Complications

Noted in 15% of the patients, lower lobe pneumonia and atelectasis, were the common complications. These were noted in 28 patients, usually in older patients pleural effusion is noted in 3 patients. Adult respiratory distress syndrome occurred in two patients and they died.

2. Wound infection :

Seen in 16% of the cases. These were usually collection of pus sub cutaneously and were drained in early post operative days. Wound dehiscence occurred in 12 cases and they required secondary suturing.

3. Subphrenic and pelvic abscesses :

4 cases of subphrenic and 6 cases of pelvic abscess occurred, and those were drained. Fever and mucus diarrhoea occurred in late postoperative day in these cases.

4. Duodenal Fistulae:

Duodenal leaks occurred in 2 cases and were managed conservatively Usually the patients those developed complications are older people.

Comparison of complications with other study by Kamal Jaswal and R.L Gupta⁽¹¹⁾

TABLE -9

Complications after definitive Surgery :

Wound infection was established in one patient.

No other complications noted due to the definitive surgery.

MORTALITY

Patients who died due to duodenal perforation were considered of the 250 patients in this study overall mortality is 3.6% (i.e.13 patients)

Mortality Trend after different methods of management is as follows :

TABLE 10

Overall mortality reported in the series of A.K.Dev and S.Paul(16) was 13% and Dark Mac 12 reported 17% of overall mortality . In present study the overall mortality is 3.6 %.

Sawyer et al observed 2.8% mortality with definitive sur-

gery in comparison to 6.7% with simple closure. In present study no mortality with simple closure and definitive procedure, it was clearly understood that the definitive procedure is performed in only selected patients having good general condition. But the simple closure is performed in all the cases associated with or without risk factors.

FACTORS INFLUENCING THE MORTALITY

1. Age
2. Method of Treatment
3. Time interval between onset and treatment.
4. Preoperative shock.
5. Amount of peritoneal fluid

1). Age:

Mortality increases as the age advances P.K.Senobserved 66% of mortality in the group of 61 – 71 yrs. In the present study 45% mortality was observed in the age group above 61 yrs.

2). Method of Treatment :

Out of 250 cases, the 237 cases managed surgically were associated with 0% mortality, where as 13 cases treated conservatively were associated with 69.2 % mortality.

It shows that mortality is very high in conservative management when compared to surgical management.

3).Time interval between onset and treatment :

It is very important factor which determines the mortality and morbidity in the case of duodenal perforation as the time of interval increases, the mortality and morbidity is high. Sawyer J.L and Mark J.B.D described a "Golden period" upto 12 hrs between perforation and operation.

Kamal Jaswal and R.L. Gupta(11)recorded the duration of perforation before surgery. They found 38.4% patients reported the hospital before 24 hrs.

38.6% after 48hrs and remaining between 24 to 48 hrs. They also found that mortality is high in those who have reported after 48hrs.

In the present study most of the patients reported between 24 to 48 hrs.

Less than 12 hrs - 18%

12 - 24 hrs - 22%

24 - 48 hrs - 43%

after 48hrs - 17%

It is noted that patients reported after 48hrs were in shock. Toxic and extensive peritoneal contamination was noted in these patients. Mortality was recorded high in these patients.

4). Amount and character of peritoneal fluid:

Amount of peritoneal fluid reflects the peritoneum and body response towards the crisis of the peritonitis. Amount of peritoneal fluid has direct association with rise of mortality and morbidity rates. Peritoneal fluid is bile stained in

32% of patients. Turbid in 28% and purulent in 40% of patients.

More than 25% of patients had the peritoneal fluid of 1500ml or above. In spite of careful peritoneal toilet, most of these patients have developed the complications like prolonged ileus, septicemia, pelvicsubdiaphragmatic abscess and wound infection.

5). PRE OPERATIVE SHOCK:

Less than 100mm Hg of systolic blood pressure at the time of presentation to hospital considered that those were in shock. Out of 250 cases, 78 patients have presented with shock. As soon as they came to hospital, revival was done with intravenous crystalloids.

65 patients have recovered from the shock and they were subjected to operative management. 13 patients have associated medical diseases like severe respiratory distress, jaundice and decompensated shock were taken for conservative management.

9 (69.2%) patients have died out of 13 patients.

This indicates that shock is a grave prognostic factor in the patients of perforated duodenal ulcer.

SUMMARY

The study was done in ALLURI SITA RAMA RAJU ACADEMY OF MEDICAL SCIENCES, from November 2010 to October 2012.

250 cases were studied in this series. Perforation most commonly occurred in the age group of 31 – 40 yrs. youngest patient in this series is 15yrs and oldest is 78yrs. Perforation was more common in winter season. Patients of perforation were usually manual labourers.

14% of these patients have the history of consumption of NSAIDs and 4.6% of corticosteroids.

68% of patients had history of ulcer symptoms before perforation and 32% patients had no history.

Most of these patients are smokers 42 (16.8%) and alcoholics 63 (25.2%), while both were 115 (42%).

Most of the patients came to the hospital after 24hrs with shock.

These patients were revived with intravenous fluids and those revived from the shock were taken for surgery. Out of 250 patients 237 patients have been managed surgically.

13 Patients who did not recover from the shock and had associated medical diseases have managed conservatively with 69.2% mortality. The method of simple closure and omental graft was done in 226 patients with no mortality.

Definitive surgery was done in only young and stable patients who came to the hospital before 12hrs with minimal peritoneal contamination and not associated with medical diseases. Definitive surgery along with closure of perforation was done only in 11 patients with no mortality.

Post operative complications noted are pulmonary complications in 15.6 % patients, wound infection – 17.2 % patients, suture leaks occurred in 3 cases and were managed

conservatively.

No specific complications regarding definitive surgery are seen.

Factors influencing the mortality and morbidity:

- 1) Age of the Patient: 45% of patients dead were in the age group of 61 and above.
- 2) Method of Treatment : Conservative management showed 69.2 % mortality. Simple closure and omental grafting showed no mortality. Definitive surgery along with simple closure had no mortality. This was done in selected patients.
- 3). Time interval between onset and surgery: Mortality is high in those who came to the hospital after 48hrs.
- 4). Preoperative Shock: 8.7 % mortality was noted in those patients with persistent shock in the preoperative period.

FOLLOW - UP

Most of the patients were followed in the early post operative period.

190 patients were followed for a period ranging from 1 to 1 1/2 years. Out of these patients 106 (56%) patients turned up with recurrent ulcer symptoms. Byrd and Carison reported a symptomatic recurrence rate of 45% after simple closure. Another study by V.Mourougayan and S.R.Smile reported 68.7% of recurrence rate out of these 106 patients 62 patients have reduced ulcer symptomatology with Medical Treatment. The medical treatment could not relieve the ulcer symptomatology in 44 patients. All these patients were subjected to Endoscopic examination and biopsies were taken and sent to detect H.Pylori infection.

40 patients had H.Pylori infection and these patients were put on one of the H. Pylori eradication regimens. Out of the 40 patients 24 patients were having ulcer symptomatology even after the treatment with H.Pylori eradication regimen.

On Endoscopic examination these patients were found to have deformed duodenal cap and partial stenosis. 19 of these patients were subjected to definitive surgery that is, Truncal vagotomy and posterior gastrojejunostomy. All were asymptomatic after 6 months of follow up.

CONCLUSIONS

Duodenal ulcer perforation is the second most common abdominal emergency in our study. After invention of the H₂ blockers and proton pump inhibitors the role of elective surgery for duodenal ulcer has been drastically decreasing, but the incidence of perforation is not much changing.

The incidence of perforation is more in middle aged males. This trend can be attributed to their increased predisposition to smoking and alcohol. It is noted that post operative pulmonary complications and wound infection are more in the alcoholics and smokers. The male to female ratio has been decreasing year by year. most of the patients came to our hospital were of low socio-economic status, more over as these people are less health conscious, they reported late to the hospital.

Most of the patients who have developed pain abdomen

after consumption of food within 3-4 hrs.

NSAIDs are playing a role in the causation of perforation especially in old females because of usage of NSAIDs for their Rheumatological problems. It has been proved that perforations are more common in winter season.

Most of the patients came to the hospital after 24hrs. Mortality and morbidity rates are high in those patients who came to the hospital 48hrs after onset of the pain.

Out of 250 patients previous history of peptic ulcer disease is present in 68% of patients.

Conservative line of management has shown high mortality when compared to the surgical line of management (69.2 %).

Simple closure with reinforcement by omental graft was proved to be quick and effective method of management in duodenal perforation. But though they have recovered from peritonitis due to perforation, majority of these patients came back with recurrent ulcer symptoms. Medical Management relieved symptoms in most of these patients.

Endoscopic examination as a method of follow up is mandatory in these patients for the detection of recurrent ulcer.

H.Pylori infection has got an association with the recurrence of the symptoms. So the patients with the recurrent ulcer symptoms should be investigated for H.Pylori infection and they should be treated.

Emergency definitive surgery can be done safely with good results in those patients who are in good general condition with minimal peritoneal contamination.

The possibility of emergency definitive surgery should be considered as this gives reduced recurrence rates and reduces the burden of second surgery on the patient.

The factors that influence mortality are persistent preoperative shock, concurrent medical illness, old age and long time interval between the onset and surgery. The mortality was high in those patients.

TABLE 1

Sl.No	Age in Yrs	No.of Cases
1	10 - 20	6
2	21 - 30	64
3	31 - 40	82
4	41 - 50	54
5	51 - 60	21
6	61 - 70	19
7	71 - 80	4

Total	250
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TABLE 2

Year	Male	Female
2010	61	20
2011	94	25
2012	38	12

TABLE 3

Author	Year	Total No.of Cases	Male : Female
C.S.P.Rao G.G.H.KKD	1987	100	96 : 4 (24 : 1)
P.C.Sood R.L.Gupta	1995	112	104 : 8 (13 : 1)
Present study	2012	250	193 : 57 (3.4 : 1)

TABLE 4

Months	Number of patients
January - March	24
April - June	43
July - September	105
October - December	78

TABLE 5

Occupation	No.of Perforations	%
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Manual Labourers	136	54.40%
Farmers	42	16.80%
Drivers	21	8.40%
Clerks and Govt. Servants	20	8.00%
Students	13	5.20%
Others	18	7.20%

TABLE 6

History of dyspepsia / peptic ulcer disease	Incidence
Yes	68 %
No	32 %

TABLE 7

Habits	No of patients	percentage
Smoker	42	16.8 %
Alcoholic	63	25.2 %
Both	115	42 %
Nil	40	16 %

TABLE 8

Blood group	No.of cases	Percentage
O	108	43.2%
A	51	20.4%
B	69	27.6%
AB	22	8.8%

TABLE 9

Complications	Gupta ¹¹	Present Study
Total No. of patients	212	237
Wound infection	15	35
Chest Infection	12	38
Abscess (pelvic + subphrenic)	3	10
Duodenal Fistulae	4	2

TABLE 10

MORTALITY

Method of Operation	No.of patients	mortality	%
Simple closure with omental graft	226	NIL	NIL
VIL TV + GJ	11	NIL	NIL
Non Operative of conservative	13	9	69.2%
TOTAL	250		
	Overall mortalities %		3.6 %

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