

# A Clinical Study of Duodenal Ulcer Perforation

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## Abstract

**Background and Objective:** Duodenal perforation is one of the most important complications of peptic ulcer. It is still a life-threatening catastrophe. This study deals with age and sex incidence and incidence of acute and chronic duodenal ulcer going for perforation, mode of presentation, and role of operative treatment versus conservative management. The post-operative complications, mortality of duodenal ulcer perforation, and prevention and role of early intervention are studied.

**Materials and Methods:** A 30 patients were selected who were diagnosed as duodenal ulcer perforation admitted in Government Medical College, Siddipet, during September 2018–December 2019. The patient underwent definitive treatment. Data related to the objectives of the study were collected.

**Results:** Majority of patients belong to the age group of 30–39 years and common in males. Most of the perforation are in the I part of duodenum anteriorly. Common in low socioeconomic group and maximum seasonal incidence in July to September (40%). The open surgery (97%), that is, simple closure with Graham's patch in 70% of cases is the commonly done procedure with minimum complications. Only one case managed conservatively.

**Conclusion:** I conclude that the duodenal ulcer perforation is common in the 4<sup>th</sup> decade, in males and related to heavy smoking, anxiety, chronic alcoholism, intake of nonsteroidal anti-inflammatory drugs (NSAIDs), and also long-standing untreated duodenal ulcer. Even with the advent of laparoscopic surgery, open surgery like simple closure with Graham's patch is the most common procedure done and is the most effective treatment. The post-operative complications are usually very less.

**Key words:** Chronic duodenal perforation, Duodenal ulcer, Graham's patch, Omentum

## INTRODUCTION

Perforation is one of the most important complications of a peptic ulcer. In spite of modern management, it is still a life-threatening catastrophe. The sudden release of gastric or duodenal contents into the peritoneal cavity through a perforation leads to a devastating sequence of events which if not properly managed, is likely to cause death. Perforation may occur in a patient with a known chronic peptic ulcer or it may happen without any preliminary symptoms at all (20%).

Recent statistics indicates that roughly 10% of the population develop a gastric or duodenal ulcer in lifetime. Roughly 1–3%

of population above the age of 20 years have some degree of peptic ulcer activity during any annual period.

Acute perforation is one of the complications of chronic duodenal ulcer (DC) and occurs in about 10–15% of all recognized chronic peptic ulcers.

Lort Moynihan has stated that perforation of duodenal or gastric ulcer is one of the most serious and most overwhelming catastrophes that can befall a human being.

A detailed history with regard to the symptomatology of the patient, a meticulous examination of the patient, radiological and biochemical investigations help to arrive at a correct preoperative diagnosis.

Operative method is still the treatment of choice and simple closure of perforation is the method followed in most of the surgical centers.

Conservative treatment is definitely unsuitable for routine use. However, few of the patients who are brought to

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the hospital at a late stage, have major concurrent illness and pre-operative shock, may improve with conservative treatment with Herman Taylor's regimen.

Immediate treatment for perforated peptic ulcer has been an established procedure for sometimes now. It can be stated that immediate definitive surgery like truncal vagotomy with a drainage procedure or proximal gastric vagotomy (PGV) after simple closure for perforated duodenal ulcer offers the prospects of a permanent cure with a mortality and morbidity comparable to that of patients with elective surgery.

The recent studies show that whenever a definitive surgery is deemed an appropriate addition to a simple closure of perforated DU, PGV is the procedure of choice.

If the condition is not diagnosed properly and not adequately treated, is progressed in a definite manner with a typical course, and may lead to the death of the patient due to bacterial peritonitis in about 7–8 days.

### Objectives

1. The present study has been undertaken to evaluate the age and sex incidence, the incidence of acute and chronic duodenal ulcer going in for perforation
2. The importance of various clinical signs and mode of presentation, the role of operative treatment compared to conservative treatment, definitive surgery versus simple closure of perforation
3. The post-operative complications and mortality of duodenal ulcer are also studied.<sup>[1-5]</sup>

## MATERIALS AND METHODS

This study has been based on the analysis of 30 cases of duodenal ulcer perforation, admitted Government Medical College, Siddipet, during September 2018–December 2019. The cases were admitted as emergencies. After admission, a detailed history was taken and clinical examination was done and possible immediate investigations were done.

Out of 30 cases admitted, 29 cases were subjected to emergency laparotomy and one case was treated conservatively. At laparotomy, the site of perforation, size of perforation, and amount of peritoneal contamination were determined. The following procedures were adopted in the management, namely, conservative, simple closure and definitive procedure, peritoneal toilet, and flank drainage.

The decision regarding the line of treatment and type of surgery to be undertaken for each case was arrived after consideration of the following factors:

1. Age of the patient
2. General condition of the patient
3. Evidence of shock
4. Duration of perforation
5. Associated medical illness – for example, cardiac and respiratory
6. Amount of peritoneal contamination of laparotomy.

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 h 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.

That patient who came 48 h after developing perforation with associated shock and associated medical illness was declared not fit for surgery and treated conservatively.

Patients were followed up everyday with continuous bedside monitoring of vital data in the immediate post-operative period. Due attention was paid to note the development of any complication. Suitable and appropriate treatment was instituted from time to time according to the needs of the patients.

After satisfactory improvement, patients were discharged from the hospital with advice regarding the diet, rest, drugs to be taken, and need for periodic checkup and need to undergo esophagogastroduodenoscopy (EGD) after 6 months.

Patients who came for regular checkup were examined in detail. A general physical examination and examination of the abdomen were carried out to note the condition of the operative scar and for evidence of tenderness over the various regions of the abdomen. Patients were advised necessary treatment and the need to undergo EGD after 6 months to know the presence or absence of ulcer. If present, the patients were impressed on the necessity of undergoing definitive surgical line of treatment for the chronic duodenal ulcer.

After studying 30 cases, an extensive review of the available literature has been made. All the cases were analyzed and the results were tabled.

## RESULTS AND DISCUSSION

### Summary of 20 Cases of DU Perforation

The discussion is based on the analysis of data pertaining to 30 cases.

This is summarized as follows:

#### Age Incidence

In the present series of 30 cases of DU perforation, the age of the patient varied from 20 years to 75 years. The peak age incidence was between 30 and 39 years, which is quite in conformity with the opinion expressed by leading authorities who have made observation regarding age incidence of perforation.

The present series shows that incidence of DU perforation is uncommon in adolescence as shown by the incidence of only one case, who was 16 years old. Study conducted by Mohammed and Mackey in 1982, had only three patients out of 22 cases during adolescence. Illingworth *et al.* noted (1944) that perforated DU was relatively rare in early adolescence.

#### Sex Incidence

In this present series of 30 cases, all were male. The majority of authors have reported that incidence is high in males when compared to females.

The present series is not a large series to give a definite opinion regarding the study of sex incidence but it definitely brings to light the preponderance of male incidence over the female sex. The high incidence of male can be explained on the basis of greater hardship, strains, anxiety and indulgence in smoking, alcoholism, and intake of NSAIDs. They have to endure in earning the livelihood for their family.

#### Occupational Incidence

The maximum number of cases in the present series occurred in lower socioeconomic group. In the present study, 21 were farmers and 9 were unskilled laborers. Longman noted in 1979 that perforation is more common in lower socioeconomic group of people,

#### Seasonal Incidence

The analysis of 30 cases of perforation in the present series in relation to various months showed that maximum incidence of perforation was during July and September (45%) followed by October–December (30%). It was lowest during January–March (10%).

#### Examination of Abdomen

The findings noted in the present series of 30 cases and results obtained after local examination of the abdomen have been discussed as follows:

Movement with respiration: In all the 30 cases, the movement of the entire abdomen with respiration was restricted.

Tenderness: In all 30 cases, tenderness was elicited. Only in two cases, the tenderness was limited to the upper abdomen and rest of 28 cases had diffuse tenderness. Generalized tenderness all over the abdomen is due to widespread peritonitis.

Guarding and rigidity: Guarding and rigidity were present to a variable extent over the upper abdomen and mainly generalized guarding and rigidity was present in majority of the cases due to protective spasms of the abdominal muscles in response to peritoneal irritation, from the leaking gastroduodenal contents.

Obliteration of liver dullness: Of the 30 cases, liver dullness was obliterated in 28 cases. In two cases, the liver dullness was present in the mid-axillary line.

Bowel sounds: On auscultation, bowel sounds were absent in majority of cases and sluggish in two cases.

**Table 1: Age incidence**

| Name of the author     | Year | Peak age incidence |
|------------------------|------|--------------------|
| Turner                 | 1951 | 30–40              |
| James Hardy and Walker | 1961 | 30–50              |
| Jamieson               | 1947 | 20–35              |

**Table 2: Sex incidence**

| Name of the author    | Year | Percentage in males |
|-----------------------|------|---------------------|
| DCM Rao <i>et al.</i> | 1984 | 100                 |
| Kumar and Ghose       | 1969 | 99                  |
| Minhas                | 1987 | 80                  |
| Thompson              | 1937 | 94.25               |
| Judin                 | 1939 | 98.1                |

**Table 3: Seasonal incidence**

| Months           | No. of patients | Percentage |
|------------------|-----------------|------------|
| January–March    | 4               | 13.3       |
| April–June       | 6               | 20.0       |
| July–September   | 12              | 40.0       |
| October–December | 8               | 26.7       |

**Table 4: Associated complications**

| Disease               | No. of patients | Percentage |
|-----------------------|-----------------|------------|
| Chronic bronchitis    | 6               | 20         |
| Anemia with emphysema | 2               | 6.6        |
| Osteoarthritis        | 2               | 6.6        |
| No other problem      | 20              | 66.8       |

**Table 5: Type of treatment**

| Type of treatment   | No. of patients | Mortality |
|---------------------|-----------------|-----------|
| Conservative        | 1               | 1         |
| Surgical management | 29              | 0         |

**Table 6: Post-operative complications**

| Complications    | No. of patients |
|------------------|-----------------|
| Pneumonitis      | 1               |
| Wound infection  | 2               |
| Wound dehiscence | 1               |
| Biliary leak     | 1               |
| None             | 25              |

### Systemic Examination

Associated medical illness: About 66.8% of patients had no other systemic problems. Out of the remaining 33.2% who had systemic problems – 6 patients (20%) had associated chronic bronchitis, one patient had anemia, and one had osteoarthritis.

Associated medical problems are one of the major factors in deciding of the major factors in deciding the line of treatment (conservative or operative) and type of surgery if operative line of treatment is decided.

Plain X-ray of abdomen: In all the cases, plain X-ray was taken in erect position. In two cases, there was gas under both domes of diaphragm, in one case, gas under left dome of diaphragm and rest of the cases there was gas under the right dome of diaphragm.

The amount of gas under the diaphragm will give a clue to the size of the perforation. In cases of massive collection of gas under the diaphragm, there was large perforation, whereas small amount of gas indicated smaller size of perforation. In the present series, the average height of gas under the diaphragm was 2.1 cm–3.3 cm.

### Treatment

In the present series, out of 30 cases, 29 cases subjected to surgical management and one patient was treated on conservative basis because he had a 2-day-old perforation.

He presented with shock and dehydration and he also had associated medical problems such as chronic bronchitis and emphysema. The patient never recovered from the shock and died next day.

### Pre-operative Treatment

In all cases, immediately after the admission, a thorough clinical workup was done, intravenous fluids started, antibiotics given, and nasogastric aspiration started. Tetanus toxoid given, preparation of part done, and blood drawn for blood grouping and cross-matching. Appropriate measure taken to correct the shock [Tables 1-6].<sup>[6-10]</sup>

### CONCLUSION

Duodenal ulcer perforation is common in the 4th decade, in males and related to heavy smoking, anxiety, chronic alcoholism, intake of nonsteroidal anti-inflammatory drugs (NSAIDs), and also long-standing untreated duodenal ulcer. Even with the advent of laparoscopic surgery, open surgery like simple closure with Graham's patch is the most common procedure done and is the most effective treatment. The post-operative complications are usually very less.

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