
Factors Affecting Morbidity and Mortality Rates in the Management of Perforated Duodenal Ulcer

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Abstract:

Objectives: To assess the surgical management of perforated duodenal ulcer with regards to certain factors and determined the association of these factors with morbidity, mortality & complication.

Patients & Methods: A total number of 60 patients with duodenal perforations were included in this cross-sectional study. They were treated in Baghdad and Tikrit Teaching Hospitals during the period from July 2001 to Dec. 2002.

Results: The patients with perforated DU were 55 males 91.7% & five females 8.3% with age ranging from 18-65 years and the mean age was 35 years. Only three died so the case fatality rate was 5%, complications developed in 14 (23.3%) patients.

Some factors play a role such as age, duration between perforation and treatment, Extent of peritonitis, shock, type of surgery, concurrent medical diseases and, history of DU.

Conclusion: We can conclude that elderly shocked patients who presented late and gave at least one concomitant medical disease have significantly higher morbidity, mortality.

Key words: Morbidity, Mortality, Perforated Duodenal Ulcer.

Introduction:

Perforated gastro-duodenal ulcer is a common surgical emergency, but it seldom results in death nowadays, different studies show a mortality rate of about (5%)^[1].

The immediate definitive surgery can be safely attempted if governed by certain criteria without any increased mortality or morbidity if it was adequately chosen and executed^[2,3,4].

The most common site for perforation of duodenal ulcer (DU) is the anterior surface of the first part of duodenum⁽¹⁾. After perforation, duodenal contents escape into the peritoneal cavity leading first to chemical irritation (peritonism). The peritoneum reacts to this irritation by copious peritoneal fluid which gives transient relief of symptoms for few hours, and then bacterial peritonitis sets in after six hours^[1].

Patients & Methods:

A total number of 60 patients with duodenal perforations were included in this cross sectional study.

They were treated in Baghdad and Tikrit Teaching Hospital during the period from July 2001 to December 2002.

All those 60 patients were resuscitated by nasogastric suction, intravenous fluid (IV) and were covered by antibiotic. Erect abdominal x-Ray was performed followed by urgent surgery which included simple closure with omental patch reinforcement together with peritoneal toilet and tube drainage in 54 patients (90%) Definitive surgery (Vagotomy with drainage

procedure) was offered to six patients only (10%) who fulfilled the following criteria:

- 1- Young fit patients (20-40 years)
- 2- Early perforation (<12 hours)
- 3- Positive history of ulcer prior to perforation
- 4- Limited localized peritonitis

Post-operatively, all patients were kept in a semi-sitting position, with nasogastric tube aspiration, IV fluids, parental antibiotics against an aerobic and anaerobic microorganism, parental H₂ blockers (cimetidine), and chest physiotherapy and adequate analgesia. Also we studied the influence of some factors.

Data analysis was carried out as frequency, percentage and using the chi-square test and $p < 0.05$ considered significant.

Results:

There were 55 males (91.7%) and 5 females (8.3%), with an age range from 18-65 years (mean age was 35 years).

Out of these 60 patients, only three died so the case fatality rate was (5%). Those three patients who died there was a delay in admission to the hospital more than 24 hours from the onset of the symptoms and the deaths were due to renal failure, septicemia and disseminated intravascular coagulation (DIC). Complications developed in 14 (23.3%) patients as listed in (Table 1).

Table 1. Distribution of complication raised in patients with perforated (DU).

Complication	No.	%
Wound infection	6	10%
Abdominal abscess	2	3.3%
Renal Failure	2	3.3%
Respiratory complication	2	3.3%
DIC	1	1.7%
Septic shock	1	1.7%
Total	14	23.3%

Erect abdominal x-ray films showed air under diaphragm in 39 patients (65%).

This study indicates that some factors play a role and have high association with the out come (Table 2).

These factors are:-

1- Age:

Complications & death were mainly in patients aged 50 years or more, 12 patients (100%) developed complication & 3 deaths (25%). Only 3 patients of those under 50 years developed complication (Table3).

Table 2: Some of the influencing factors to morbidity and mortality observed in the study group

factors	No	%
Age <50 years	48	80%
>50 years	12	20%
Time interval		
<12 hours	48	80%
>12 hours	12	20%
Extent of peritonitis		
Generalized	15	25%
localized	45	75%
Shock		
Present	6	10%
Absent	54	90%
Type of surgery		
Simple closure	54	90%
Definitive	6	10%
Concurrent Medical diseases		
Present	12	20%
Absent	48	80%
History of duodenal ulcer		
Positive	30	50%
negative	30	50%

Table 3: Distribution of cases according to age.

Age	No. of patients		No. of death		No. of complication	
<50 years	48	80%	0	0	2	4%
>50 years	12	20%	3	52%	12	100%
Total	60		3	5%	14	23.3%

2- Duration between perforation and treatment:

The group who were treated after a time interval less 12 hours since perforation were 48 patients there was no mortality among them & only six patients (12.5%) had complications, while among the second group which included those who had duration of perforation more than 12 hours (12 patients), There was three death (25%) and eight patients (66.6%) developed complication there was statistically significant association (p0.0001)there

was statistically significant association (p0.0001) (Table 4).

3- Extent of peritonitis:

Two groups of patients, those with generalized peritonitis (15 patients). There were three deaths (20%) and ten patients (66.7%) had complications.

While other groups with localized peritonitis (45 patients), they had no death and only four patients had complications there was significant association (p0.0001) (Table 5).

Table 4: Duration of perforation.

Perforation	No. of patients		No. of deaths		No. of complication	
<12 hours	48	80%	0		6	12.5%
>12 hours	12	20%	3	25%	8	66.7%
Total	60%		3	5%	14	23.3%

$X^2=15.75$ d.f=1 P= 0.0001(significant)

Table 5: Extent of peritonitis

Extent of peritonitis	No. of patients		No. of death		No. of complication	
Generalized	15	25%	3	20%	10	66.7%
Localized	54	75%	0		4	9%
Total	60	100%	3	5%	14	23.3%

$X^2=25.49$ d.f.1 P= 0.0001(significant)

4-Shock:

six patients were shocked at time of presentation, three of them died (50%) and three (50%) had complication, while the remaining of

patients(54) had no shock with no mortality and 11 patients (20%) had complications there was no significant association($p=0.103$) (Table 6).

Table 6: Distribution of cases according to shock

shock	No. of patients		No. of death		No. of complication	
Present	6	10%	3	50%	3	50%
Absent	54	90%	0		11	20%
Total	60	100%	3	5%	14	23.3%

$$X^2 = 2.65 \quad d.f=1 \quad P= 0.103 \text{ (NS)}$$

5- Type of surgery:

Fifty patients were treated by simple closure reinforcement by omental patch; three of them died (5.6%) while 14 (26%) patients had complications. Only six patients had definitive surgery (vagotomy and drainage operation). With no death or complications there was no significant association (Table 7).

6- Concurrent Medical Diseases:

Patients who had one or more medical diseases like; hypertension, respiratory diseases (pneumonia, TB and asthma), liver cirrhosis, myocardial infraction, arrhythmia and renal diseases, were 12 patients, 3 patients of them died (25%) and 6 had complications (50%).

Patients without any medical problems they were 48 patients, no death occurred only eight patients (16.7%) had developed complications there was significant association ($P= 0.02$) (Table 8).

Table 7: Type of treatment.

Type of treatment	No. of patients		No. of death		No. of complication	
Simple closure	54	90%	3	5.6%	14	26%
Definitive surgery	6	10%	0		0	
Total	60	100%	3	5%	14	23.3%

Table 8: Concurrent Medical diseases.

Concurrent medical diseases	No. of patients		No. of death		No. of complication	
Absent	48	80%	0		8	16.7%
Present	12	20%	3	25%	6	5%
Total	60	100%	3	5%	14	23.3%

$$X^2 = 5.96 \quad df: 1 \quad P= 0.02 \text{ (significant)}$$

7- History of DU:-

Thirty patients had positive history of (DU); two of them died (6.7%), while eight patients (26.7%) developed complications.

Also thirty patients had no history of (DU), one death (3.4%) and six patients had developed complications there was no significant association ($P=0.542$) (Table 9).

Table 9: History of (DU)

History of (DU)	No. of patients		No. of death		No. of complication	
Positive	30	50%	2	6.7%	8	26.7%
negative	30	50%	1	3.4 %	6	20%
Total	60	100%	3	5%	14	23.3%

$X^2=0.37$ df: 1 $P=0.542$ (NS)

Discussion:

The control of risk factors that affect morbidity and mortality in the surgical management of perforated (DU) might limit and reduce their worse effects and improve the outcome of surgery [5,6,7].

There are many factors, which are mostly connected to each other affecting the prognosis regarding morbidity and mortality rates, such as age, duration of perforation, extent of peritonitis, preoperative shock, pre operative treatment, surgical facilities, concomitant medical disease and previous history of ulcer [8,9].

The age affected the morbidity and mortality rates it was higher among elderly patients.

Duration of perforation longer than 12 hours was found an important factor influencing morbidity and mortality rates.

Generalized peritonitis was higher mortality and morbidity rates and was complicated by septicemia in a large number of patients.

The shock state in pre-operative period is a very important risk factor especially if associated with medical disease.

If shock was not corrected properly pre-operatively, it reflects on mortality but not on morbidity.

Type of operation, simple closure of perforation with omental patch reinforcement, peritoneal toilet and tube drain left in the area was the ideal procedure for this emergency state with a good result.

Definitive surgery in young patients with long history of (DU), short duration of perforation with localized peritonitis in the hands of experienced surgeon gave very good results.

This is in agreement with other previous studies abroad that reported.

The definitive surgery can be safely attempted if governed by certain criteria without any increased mortality or morbidity if it was adequately chosen and executed [2,3,4,9,10].

Also there was no difference concerning the long history of (DU), but there was association with concurrent medical diseases.

The study findings (23.3% morbidity and 5% mortality), were comparable with some Western researchers (9-37% morbidity), (2.3-18% mortality) [11,12,13].

We can conclude that elderly shocked patients who present late and have at least one concomitant medical disease have higher morbidity and mortality rates irrespective of the type of surgery performed.

Moreover definitive surgery is advised with no increase in the mortality only in selected cases (young age, short duration of perforation and history of (DU)).

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