

ORIGINAL ARTICLE

Immediate Results of Omentopexy in Perforated Duodenal Ulcer: A Study of 186 Cases

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Abstract: *Aim of the Study:* The study was conducted to determine short term results in view of associated diseases, complications, mortality and hospital stay in patients with duodenal ulcer perforation treated by omentopexy. *Main Findings:* Age of patients range from 15 to 85 years; mean age was 45.58 years; In all cases, perforation was present on the anterior surface of the first part of the duodenum. Size of perforation varied from 0.3 to 2.5 cm. 50 (26.88%) patients had co-existing illnesses. Among the complications, the commonest complication was wound infection. 53 patients (28.49%) had wound infection, 45 patients (24.19%) had lung infections, 5 patients (2.68%) had re-perforation of the ulcer, 2 patients (1.07%) had burst abdomens, 2 patients (1.07%) had pelvic abscesses and 1 patient (0.53%) had DIC. Mortality was 18 patients(9.67%). Median hospital stay was 10 days. *Conclusion:* Perforation is one of the most catastrophic complications of peptic ulcer. In spite of modern advances in surgical, anesthetic and ancillary facilities, it still assumes life threatening dimensions. Omentopexy is a simple and safe procedure. The most important factors predisposing to complications are delay in admission to the hospital, associated diseases and shock on admission. Mortality and morbidity can be reduced by early admission, prompt resuscitation, treatment of associated diseases, early surgical intervention and prophylaxis of complications. **Keywords:** Peptic ulcer perforation, Duodenal ulcer, Repair technique, Omentopexy, Mortality and Morbidity.

Introduction

Ulcer perforation was a rare disease in the nineteenth century; however its incidence increased greatly at the turn of the twentieth century. Since then, the world has seen an epidemic of duodenal perforations among young men which now seems to be waning [1-3].

The incidence of perforated peptic ulcer in Western countries varies between 7 to 9 cases per 100,000 population per year [4]. Following the introduction of H₂ – Receptor blockers and proton pump inhibitors, there has been a sharp decrease in elective peptic ulcer surgery. However, emergency operations for complications such as perforations are on the rise [5-6]. An epidemiological change with increase in age and increase in the number of female patients has been noted [7]. Free perforation into the general peritoneal cavity can be a catastrophic event, the signs and symptoms of which do not usually cause problems in diagnosis [8]. Once the diagnosis of perforation has been made, it is generally agreed that emergency surgery should be performed as soon as the patient has been adequately resuscitated [9].

Accepted therapeutic options are either simple closure or immediate definitive operation. Conservative treatment, originally proposed by Wangensteen, is reserved for patients considered to be too ill to stand the stress of surgery [4]. Laparoscopic closure of duodenal ulcer perforation is safe and effective and may be an alternative to open surgery with a low morbidity [10]. Simple closure of a perforated peptic ulcer is a standard operation at many centers as a quick straightforward procedure but might involve significant risk of later complications for recurrences [11]. There is an obvious return from definitive anti-ulcer surgery to simple closure of perforations followed by antisecretory and antibacterial medication in recent years [12]. Duodenal ulcer perforation is a common surgical emergency in our department, however most of the patients present late (usually after 2-3 days) because of illiteracy, poverty and ignorance. In addition, most of the patients are admitted under the care of general practitioners for the first 1 or 2 days. This study was conducted to analyze the short term outcome of duodenal ulcer perforation treated with simple closure in terms of associated diseases complications, mortality and duration of hospital stay.

Material and Methods

This case series was conducted in the surgery department of Al-Ameen Medical College, Bijapur from January 2000 to 2010. The cases files of all the patients were retrospectively analyzed for the patient's particulars, intra-operative findings, surgery performed, post-operative stay, morbidity and mortality. Patients were diagnosed with perforated duodenal ulcer based on history, clinical examination, investigations and operative findings. After preliminary resuscitation and investigations, patients were taken for emergency surgery. In all patients, omentopexy was done. The technique of omentopexy was same in all patients. A total of three sutures of vicryl 2-0 were placed on to the normal, healthy duodenum on either side of the perforation; a pedicled strand of omentum was placed directly onto the perforation and the sutures tied above this. No attempt was made to close the perforation prior to placing the omentum as a plug. Thorough peritoneal lavage was done. On discharge, proton pump inhibitors were prescribed for 6 weeks. All the patients were advised for follow-up in the out patients department.

Data was analyzed on a computer using SPSS version 10.0. Descriptive statistics like frequency, percentage and mean, median, SD (standard deviation) were computed for data presentation. Chi-square test was used to compare frequencies at 95% confidence interval.

Results

This study was conducted on 186 patients with perforated duodenal ulcers. Out of these, 160 (86.00%) were males and 26 (14%) were females; with the male: female ratio being 6.15: 1.

Age: The age of the patients presenting with perforated duodenal ulcers ranged between 15 to 85 years. The present study showed highest incidence in the 4th, 5th and 6th decade of life.

Age Distribution	No. of cases	Percentage (%)
11-20	4	2.72%
21-30	27	16.32%
31-40	41	21.76%
41-50	52	27.89%
51-60	37	19.72%
61-70	17	8.16%
>70	8	3.40%
	186	100%

The standard deviation of age was found to be 14.27 years. Mean age was 45.58, median age was 40 years and mode is 45 years.

Particulars		Findings	Percentage
No of patients		186	100%
Age in years	Mean	45.58	
	S.D	14.27	
Sex	Male	160	86.00%
	Female	26	14%
	M:F ratio	6.15:1	
Occupation		Farmer/Coolie	
Seasonal variation	Peak incidence	August, November, June, July	
Risk Factors	Smokers	113	60.74%
	Tobacco chewers	53	28.49%
	Pan chewers	20	10.75%
	Alcoholics	109	58.60%
	Ulcerogenic drugs	19	10.21%
H/O APD prior to perforation	Dyspepsia	81	43.54%
	Intractable pain	3	0.16%
	Total	84	45.16%
Pain-surgery interval	6-48 hours	130	69.89%
	>48 hours	56	30.10%
Presenting symptoms	Localised pain	186	100%
	Generalised abdominal pain	167	89.78%
	Abdominal distension	134	72.04%
	Dehydration	109	58.60%
	Fever	80	43.01%
	Shock	40	20.50%
Pneumoperitoneum		160	86.02%

Mean duration of perforation:

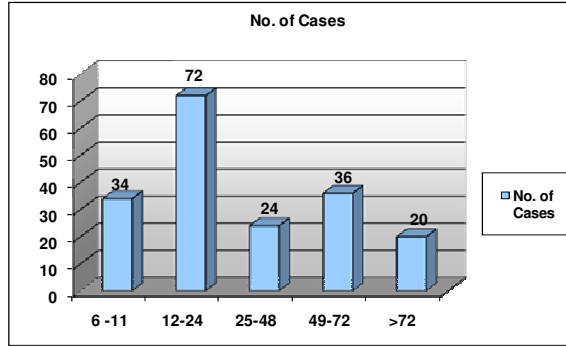


Figure-1: Delay in presentation

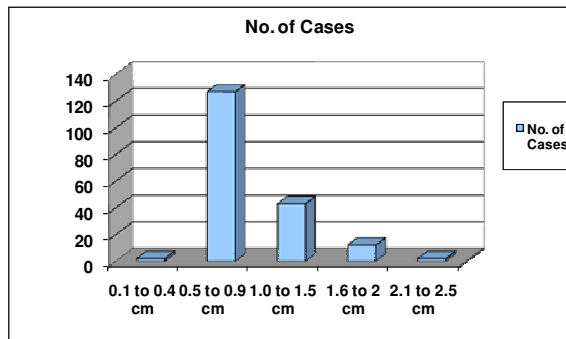


Figure-2: Size of Perforation

Associated diseases	No. of cases
CVS – Hypertension	29
Diabetes Mellitus	23
Chikungunya	9
Chronic obstructive pulmonary disease	8
Renal failure	7
Malignancy	2
Arthritis	6
Coagulation disorder	3
Gall stones	1
Pancreatitis	1
Total	89 (47.84%)

Site and Size of Perforation:

Perforation was present on the anterior surface of the 1st part of duodenum in all the cases. Minimum size of the perforation in our observation was 0.3 mm, which was seen in 2 (1.07%) cases and the maximum size of perforation was 2.5cm in 2

(1.07%) patients. About 133 (71.50%) patients had perforation sizes varying from 0.1 to 0.9 cm, 39 (21%) patients had perforation sizes varying from 1 to 1.5 cm, 12 (6.45%) patients had perforation sizes varying from 1.6 to 2.0cm and only 2(1.07%) patients had perforation sizes varying from 2.1 to 2.5cm.

Quantity of Intraperitoneal Purulent Fluid: All the patients had purulent peritonitis. 111 patients (59.67%) had 500 to 1000 ml of intraperitoneal purulent fluid, 38 patients (20.34%) had >1000 but <1500 ml, 28 patients (15.05%) had >1500 but <2000 ml and lastly, 9 patients (4.83%) had more than 2000 ml of intraperitoneal purulent fluid. The quantity of purulent fluid > 1000 ml was observed in 75 (40.32%) patients, Out of these 75 patients with intraperitoneal purulent fluid >1000 ml, 56 patients had duration of perforation of more than 48 hours. All the patients underwent simple closure with viable omental patch and fixation with 3 sutures of 2-0 vicryl.

Complications: Out of 186 patients 98 patients (52.68%) had 108 complications. Among these, the commonest complication was wound infection which was seen in 53 patients (28.49%). 45 patients (24.19%) had lung infections, 5 patients (2.68%) had re-perforation, 2 patients (1.07%) had burst abdomens, 2 patients (1.07%) had pelvic abscesses and 1 patient (0.53%) had DIC.

	Complication	No. of Complication	Percentage (%)
General complication	Lung Infection	45	24.19
	DIC	1	0.53
Abdominal complication	Reperforation	5	2.68
	Burst Abdomen	2	1.07
	Pelvic Abscess	2	1.07
Local complication	Wound Infection	53	28.49
	Total	108	58.06%

	n number	Mortality (n)	Mortality (%)	P-Value
Male : Female	160 : 26	12 : 6	7.5 : 23.07	0.005
Age < 65 > 65	163 : 23	3 : 15	1.84 : 65.21	0.0001
Previous Ulcer History Yes : No	84 : 102	9 : 9	10.71 : 8.82	NS
Associated diseases Yes : No	89 : 97	18 : 0	20.22 : 0	0.0001
Delayed operation Yes : No	56 : 130	12 : 6	21.42 : 4.61	0.0004
Shock on admission Yes : No	40 : 146	17 : 1	42.5 : 0.68	0.0001
Postop. General Complication Yes : No	46 : 140	6 : 12	13.04 : 8.57	NS
Postop. Abdominal Complication Yes : No	9 : 177	4 : 14	44.4 : 7.90	0.0001
Postop Wound Complication Yes : No	53 : 133	9 : 9	16.98 : 6.76	0.0334

Data analysed by χ^2 test

Discussion

The age of the patients presenting with perforated duodenal ulcer ranged between 15 to 85 years .The present study showed highest incidence in the 4th, 5th and 6th decade of life. One study reported most of the patients with perforated duodenal ulcer in the third decade of life [13-14] while another reported most of the patients with perforated duodenal ulcer in the fourth decade of life [15].There is shift of age towards elderly in other parts of the world [16]. It may be due to difference in lifestyle, such as smoking, alcohol, psychological stress etc [6]. Out of 186 patients of perforated duodenal ulcer, 160 (86.00%) were males and 26 (14.00%) were females with the male: female ratio being 6.15; which is comparable with most of series [17-18].

In the present study, almost all patients were farmers or coolies and were in lower socio-economic groups. Langman in 1974 noted that since 1959, both gastric and duodenal ulcers have become more frequent in lower socio-economic groups in the UK and USA [19]. The peak incidence in this series occurred in the month of August, November, June and July. According to Aird (1957) from Edinburgh, perforations were most frequent in mid winter [20]. A peak incidence in the month of December was reported from the South-West of Scotland and Glasgow area [21]. The Pooja and Diwali festivities in October and Christmas in December may have a part to play in the increase in incidence. This has been attributed to various factors such as heavy meals or increased alcohol consumption in winter [20]. In the present series, 166 (89.21%) patients gave a positive history of tobacco use in any form and 109 (58.60%) were alcoholics. As such, a positive history of tobacco is reflected in high morbidity and mortality in the present series. All patients with associated respiratory disease gave a positive history for tobacco usage. Most ulcer perforation in subject <75 yrs of age can be attributed to smoking [22]. In the study, there were 19 patients giving definitive history of ingestion of ulcerogenic drugs. NSAIDs increase the risk of perforation by 5 to 8 times [23]. In one study 7 (20.5%) patients had history of taking NSAIDs [24]. Dayton M T in 1987 demonstrated that steroids cause a significant increase in percentage of ulcer perforations [25].

Duodenal ulcer symptoms (>3 months) were not uniformly available and was totally missed in a few cases. Out of 186 cases, 84 (45.16%) gave history of previous acid peptic disease prior to perforation and the remaining 102 (54.84%) presented as duodenal ulcer perforation. Among 84 patients, 81 patients gave history of dyspepsia and 3 patients gave history of intractable pain. Out of 84 patients, 3 patients were currently under anti ulcer treatment at the time of perforation and remaining had taken some sort of medical treatment for the same. Similar observation were by Nemanich and Nicoloff from Minneapolis (1970) [26], Mithra (1982) and Panda (1982) [20]. In this series, 130 (69.89%) patients presented within 6-48 hours of the onset of symptoms. 56 (30.10%) patients reached the hospital after 48 hours. The mean duration of perforation was 33.26 hours (Figure-1). In this present series, the incidence of complications increases with the increase in pain surgery interval in hours. The incidence of complication was minimal if surgery was undertaken within 12 hours of the onset of pain. Risk of post operative death and complications are closely related to duration of the perforation [27-28]. In the study by Kocer, the mortality and morbidity in patients presenting after 24 hours was 20% and 43.8% respectively [29]. In this study, all 186 patients (100%) presented with pain, 167 patients (89.78%) with generalized abdominal pain, 134 patients (72.04%) with abdominal distension, 109 (58.60%) with dehydration, 80 patients (43.01%) with fever and 40 patients (21.50%) were in shock at the time of admission which is comparable to most of the studies [13, 17, 24]. In the present study, shock on admission was present in 40 patients (21.50%), and among them, 95% morbidity (38 patients) and 42.50% mortality (17 patients) was noted. Testini and coworkers in their study showed 9 (6.0%) patients were in shock at the time of admission and mortality among them was 55.6% [28].

In another study, shock on admission was present in 16 (5.9%) patients and morbidity and mortality in these patients were 93.8% and 68.8% respectively [29].

Associated Illness: In the present study, cardiovascular disease, diabetes & chronic obstructive pulmonary disease were the most frequent concomitant diseases. One or more associated diseases is one of the significant factor associated with increased mortality in patients undergoing surgery [30].

Perforation site and size: In the present study, the perforation was present on the anterior surface of the first part of the duodenum in all cases. Minimum size of the perforation in our observation was 0.3 mm in 2 (1.07%) cases and maximum size of perforation in 2 (1.07%) patients were 2.5 cm. About 133 (71.50%) patients had perforation sizes varying from 0.1 to 0.9 cm, 39 (21%) patients had perforation sizes varying from 1 to 1.5 cm, 12 (6.45%) patients had perforation sizes varying from 1.6 to 2.0 cm and only 2 (1.07%) patients had perforation sizes varying from 2.1 to 2.5 cm. In one study, 59 (21.9%) patients had perforation size varying from 0.5 cm to 1 cm and 19 (7.1%) patients had perforation sizes > 1 cm [29]. In another study, 40 (25%) patients had perforation size > 1 cm. Perforation > 1 cm has significantly higher incidence of leak, morbidity and mortality when compared to small perforations [30].

Amount of purulent fluid: All the patients had purulent peritonitis. 111 patients (59.67%) had 500 to 1000 ml of intraperitoneal purulent fluid, 38 patients (20.34%) had >1000 but <1500 ml, 28 patients (15.05%) had >1500 but <2000 ml and lastly 9 patients (4.83%) had more than 2000 ml of intraperitoneal purulent fluid. The quantity of purulent fluid > 1000 ml was observed in 75 (40.32%) patients, Out of these 75 patients with intraperitoneal purulent fluid >1000 ml, 56 patients had the duration of perforation of more than 48 hours, which is comparable with most of the series [6].

Complications: The present study shows that out of 186 patients, 98 (52.68%) had 108 complications. Among these, the commonest complication was wound infection in 53 patients (28.49%). 45 patients (24.19%) had lung Infection, 5 patients (2.68%) had re-perforation, 2 patients (1.07%) had burst abdomen, 2 patients (1.07%) had pelvic abscesses and 1 patient (0.53%) had DIC. Most of these complications occurred in patients with delayed presentation of greater than 24 hours and intraperitoneal purulent fluid of greater than 500 ml. None of our patients developed bleeding. The delay before surgical treatment is a strong determinant for increased complication rates and hospital costs [27]. In one study, postoperative complications were recorded in 54 (38%) patients. The most common complications were: chest infection in 35 (24%) patients, followed by wound infection in 14 (9%) cases, burst abdomen in 3 (2%) cases and fistula in 2 (1.5%) patients [14]. In another study, postoperative complications were seen in 65 (24.2%) patients. Pneumonia and wound infection were the commonest complications seen in 40 (37.04%) and 20 (18.52%) cases respectively; followed by sepsis in 9 (8.34%) patients, leakage in 6 (5.55%) patients, intra-abdominal abscess in 2 (1.86%) cases and bleeding in 1 (0.92%) patient [29].

Mortality: The mortality in the present study was 18 (9.67%). Several factors might contribute to increased postoperative mortality. In patients with peptic ulcer, perforation has been found to be a major complication with mortality rates ranging from 6% to 31% [28]. In this series, male sex was associated with greater a mortality rate similar with Accord and others [31-32]. Age more than 65 years, associated diseases, delayed operation, shock on admission, postoperative abdominal and wound complications are factors significantly associated with increased mortality [28, 31-32].

Hospital stay: Median hospital stay was 10 days. 120 patients remained in hospital for less than 11 days and only 48 patients were admitted for more than 20 days. These observations were supported by most of the studies [5, 14]. The hospital stay varied upon the duration of perforation, initial condition of the patient, associated illness and development of postoperative complications; which is comparable with most of the studies [6, 14].

Conclusion

Perforation is the most common emergency occurring in surgical practice and is the most encountered catastrophic complication of peptic ulcer. It is more prevalent in male patients and there is change of age towards elderly. Most perforations are spontaneous but the risk significantly increases with use of NSAIDs.

Although advances have been made in fields of surgery, anesthesia and modern ancillary facilities, duodenal perforations still assume life threatening dimensions. Omentopexy is a simple and safe procedure which can be performed in a very short time and is easy to perform; however, its immediate outcome is determined by more advanced age of patient, delay in admission, presence of associated diseases and shock on admission. Thus these factors need to be carefully taken into account in order to reduce morbidity and mortality.

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