ORIGINAL ARTICLE

Experience with Acute Perforated Duodenal Ulcer in a West African Population

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Abstract:

Background: *The advent of proton pump inhibitors and helicobacter pylori eradication in the management of chronic peptic ulcer disease has reduced the operative treatment of this condition to its complications. Perforated duodenal ulcer remains a major life threatening complication of chronic peptic ulcer disease. This retrospective study reviews our experience at the Royal Victoria Teaching Hospital.*

Methods: *All patients with clinical diagnosis of perforated duodenal ulcer seen in this hospital between June 2003 and October 2005 were included in this study. Data extracted from their hospital records were analyzed for age, sex, duration of symptoms, previous history of peptic ulcer disease, use of NSAIDS, main presenting features, investigations, resuscitative measures, time of surgery, operative findings, and type of surgery offered, complications and mortality. After resuscitation, laparotomy followed by simple closure or definitive ulcer surgery and helicobacter pylori eradication therapy was given to all the patients. Duration of follow up ranged 8 to 12 months with endoscopy in some patients.*

Results: *There were 41 patients with intraoperative diagnosis of acute perforated duodenal ulcer seen over the study period, comprising 34 males (82.9%) and 7 females (17.1%), a male female ratio of 4.8:1, age range of 18-77 years and a mean age of 45.49+/-14.46 years. Previous history of peptic ulcer disease was found in 32 (78.6%) of the patient and the main presenting features were sudden onset of severe abdominal pain in 95.1% of cases and fever in 65.8%. Features of frank peritonitis were demonstrable in all the patients and 11(26.8%) presented in shock. Plain chest x-rays demonstrated gas under the diaphragm in 21(65.6%) of the patients. After adequate resuscitation, all the patients underwent laparotomy where the abdomen was explored, the diagnosis of perforated duodenal ulcer was confirmed and 29(70.7%) had simple closure of the perforation with omentum (after Graham). The average time between presentation and surgery was 9 hours (range 6-11hours). The mean size of perforation was 10.5mm (range 5-15mm). Definitive peptic ulcer surgery was done in 12(29.3%) patients. 8 had truncal vagotomy and pyloroplasty. The major complications included wound infection in 14 (34.1%), postoperative fever in 16(39.0%) and prolonged ileus in 15(36.6%) There were 7 deaths, mortality rate of 17.1% and the causes of death included severe electrolyte imbalance in 1 and gram negative septicaemia and shock in 6. The average duration of hospital stay was 10 days (range 8 36).*

Conclusion: *Perforated duodenal ulcer is a major complication of chronic peptic ulcer disease. Simple omental patch by open method and helicobacter pylori eradication therapy is sufficient to prevent reperforation.*

Key words: *Perforated duodenal ulcer, management outcome, Banjul, the Gambia.*

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Introduction

Surgical treatment of patients with perforated duodenal ulcer has shifted from definitive peptic ulcer surgery in almost all cases who presents early, to simple omental patch and helicobacter pylori eradication[1,2]. The postoperative use of proton pump inhibitors and triple therapy to eradicate helicobacter pylori has reduced the problem of reperforation after simple closure[3]. The current practice in areas where facilities abound is laparoscopic closure. The open method of closure is still relevant where there are contraindications to laparoscopy or complicated perforations.

The best surgical option for these patients is still in question. Simple closure whether using omentum or not remains a preferred option to many surgeons. It is the easiest quickest and safest procedure that can be applied in all situations, complemented by effective medical treatment to eradicate helicobacter pylori. Other surgeons advocate definitive ulcer surgery at the same sitting claiming that where indicated this does not increase morbidity and mortality.[4,5]This study reports our experience in this center where presentation is often late and definitive surgery is not feasible. Comparisons are also made with similar environments.

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Materials and Methods

Forty-one patients with clinical diagnosis of perforated duodenal ulcer were seen between June 2003 and October 2005 at the Royal Victoria Teaching Hospital Banjul The Gambia. Preoperative investigations included packed cell volume (PCV), urea and electrolytes, chest and abdominal radiographs to detect air under the diaphragm in some of the patients. Diagnosis was supported by operative findings, ranging from peritoneal soilage with clear fluid to gross pus and multiple fibrinoid adhesions in presence of an anterior or posterior duodenal perforation. Patients with other causes of perforation were excluded from the study.

Pre-operative resuscitation included administration of intravenous fluids, nasogastric suction, correction of electrolyte derangements where indicated and intravenous ampicillin/cloxacillin, metronidazole and gentamycine combination. Adequate urine output and normal serum urea and electrolytes were considered as good indications for adequate resuscitation.

The entire patients had exploratory laparotomy; at which the position of the perforation was confirmed and simple closure or definitive surgery offered. All the patients were placed on omeprazole and helicobacter pylori eradication therapy post operatively. The data extracted from patients records were, age, sex, previous history of chronic peptic ulcer disease, presenting clinical features, resuscitative measures, investigations, operative findings, operative procedures, total hospital stay, complications, and follow-up. Others were history of smoking and use of non-steroidal anti-inflammatory drugs (NSAIDS).

Results

There were 41 patients in the study, 34 males (82.9%) and 7 females (17.1%). The age range was 18-77 years with a mean of 45.49 +/- 14.46 years. The male/ female ratio was 4.8:1 (Table I). The age groups 30 39 and 50-59 years accounted for (24) 58.5% of the patients with perforated duodenal ulcer. Fifteen (35.6%) of the patients presented within 24 hours of onset of symptoms, out of which 8 had truncal vagotomy and pyloroplasty, 3 had Bilroth 1 and 1 had Bilroth 2 procedures, while 26 (63.2%) presented between 24 to 72 hours and all had simple closure. Seven patients presented to hospital more than 72 hours after the onset of symptoms and 3 of them died. None of the perforations was associated with a recent ingestion of non-steroidal anti-inflammatory drugs. Twenty-two (53.6%) of the patients admitted to smoking at least 10 sticks of cigarettes per day for upward of five years. There was a positive history of chronic peptic ulcer disease in 32 (78.6%) patients. The commonest presenting symptoms where sudden onset severe epigastric pain in 39 (95.1%), vomiting in 21 (51.2%) and fever in 27 (65.8%). Classic signs of peritonitis were demonstrated in all the patients, with 11 (26.8%) presenting in shock (systolic blood pressure of </= 80mmHg). Thirty-two (78.1%) patients had plain abdominal and chest radiographs and free gas under the diaphragm was demonstrated in 21 (65.6%) of them. All the patients had anterior pyloroduodenal perforation with moderate to massive peritoneal soilage. The mean size of the duodenal ulcer perforation was 10.5mm (range 5-15mm). A total of twelve patients (29.2%) underwent definitive peptic ulcer surgery Table II. They all presented within 24 hours of onset of symptoms. 8 (19.5%) had truncal vagotomy and pyloroplasty, 3 (7.3%) antrectomy and vagotomy, and 1 (2.4%) had gastrojejunostomy (Bilroth II procedure). Simple closure of the perforations using the pedicled or as free omental graft was done in 29 (70.7%) of the patients all these patients had considerable degrees of peritonitis, which required peritoneal lavage with 2-3 litres of normal saline. No peritoneal drains were used. The main post operative complications were, wound infection 14 (34.1%), postoperative fever 16 (39.0%), prolonged ileus 15 (36.6%), wound dehiscence 8 (19.5%) and chest infection 5 (12.1%) (Table III). There was no record of suture leak. The mean duration of hospital stay was 10 days (range 8-36 days) except those who developed postoperative complications. There were seven deaths; mortality rate of 17.1%. Causes of death included severe co-morbidity, congestive cardiac failure in one 58 year old man coupled with severe electrolyte derangement and septicaemia. The remaining six mortalities were associated with shock and septicaemia.

Table I: Age sex distribution of 41 patients with perforated duodenal ulcer.

Age(years)	Male	Female	Total	%
10 – 19	1	-	1	2.4
20 – 29	5	2	7	17.1
30 – 39	7	2	9	21.9
40 - 49	4	2	6	14.3
50 – 59	9	-	9	21.9
60 – 69	6	1	7	17.1
70 – 79	2	-	2	4.9
Total	34	7	41	100.0

Table II: Operative procedures performed in 41 patients with perforated duodenal ulcer.

Operative procedure	Frequency	%
Truncal vagotomy and pyloroplasty.	8	19.5
Omental (Graham's) patch. i) Free graft	20	48.8
ii) Pedicled omentum	9	21.9
Antrectomy and vagotomy.	3	7.3
Bilroth II procedure	1	2.4
Total	41	100.0

Table III: Postoperative complications

Complications	Frequency	%
Postoperative fever.	16	39.0
Prolonged ileus	15	36.6
Wound infection	14	34.1
Wound dehiscence	8	19.5
Chest infection	5	12.1
Septicaemia	4	9.1
Intraabdominal abscess	2	4.8
Incisional hernia	3	7.3

Discussion

This study shows that perforated duodenal ulcer is commoner in the males and most of the afflicted patients are in their third and forth decades as compared to studies in Europe and America, where this condition affects mainly the elderly in their sixth and seventh decades of life.[6,7,8] In these populations, there has been a steady increase in the age of patients and the number of women suffering from this condition such that today, it commonly affects elderly females[6]. The presentation in this series is typical as majority of the patients had sudden severe abdominal pain, associated with signs of peritoneal irritation which characteristically timed the perforations; this pattern is seen in most reported series.[9,10] Acute perforations have been associated with ingestion of non-steroidal anti- inflammatory drugs (NSAIDS), corticosteroids, and cigarette smoking[11]. In this study, prior ingestion of NSAIDS was not associated with any of the perforations. This is likely because of the young age of the subjects. This is unlike a similar study done in Ghana, West Africa[12], where 47.7% of acute gastric and duodenal ulcer perforations were associated with ingestion of non steroidal anti-inflammatory drugs. The past history of chronic peptic ulcer disease was seen in 78.6% of the patients as compared to 47% reported by Lawal and colleagues[13]. Such history has been reported in a variable percentage of patients with perforated duodenal ulcer and it is well known that perforations are possible even in the absence of a history of peptic ulceration[14]. The reason for silent perforations and why some perforations occur in patients on treatment for chronic peptic ulcer disease is not clearly understood. The outcome of treatment is largely dependent on prompt resuscitation and surgical repair of the perforation after an accurate diagnosis. Gas, seen under the diaphragm on a plain chest radiograph is an important finding that suggests a perforation, but this is only seen in upward of 50% of cases [10]. It was seen in 65.6% of cases in this study.

An issue that remains under discussion is the appropriate surgical treatment option, that is simple closure (Graham's patch) or definitive ulcer surgery. Knowing that medical treatment with proton pump inhibitors and eradication of helicobacter pylori is very effective, simple closure of perforated duodenal ulcers seems to be the correct option if the patient's clinical condition is optimal, though some studies show no difference in outcome between simple closure and a definitive ulcer surgery.[5,15] A conservative approach, (after Taylor) may be used in exceptional circumstances where the patient presents within 12 hours of perforation and the surgeon has interest and is very experienced. It is however, difficult to accept that such patients with gross peritoneal soilage can be managed without operation. In our patients, most presented over 48 hours after their symptoms mostly because of ignorance and the trial of other means of treatment. Most of them were also referred from some distant district hospitals. Therefore we resorted to simple closure of the perforations with pedicled omental patch in the majority of cases. Fifteen patients presented within 24 hours of perforation of which 12 had definitive surgery mainly truncal vagotomy and pyloroplasty. Gutierrez and colleagues[15], found no difference in postoperative morbidity and mortality in patients who had simple closure or truncal vagotomy and pyloroplasty. Using the Visick[16] scale, they found no significant differences in postsurgery symptomatology in the two groups. Postoperative fever and prolonged ileus were common in these patients. This was because of massive peritoneal soilage and infection. Wound infection accounted for 34.1% of the postoperative complications this is a consequence of the late

presentation in most of the patients. The resultant wound failure resulted in incisional hernias in 3(7.3%) of the patients.

The use of proton pump inhibitors and antibiotics to eradicate helicobacter pylori in the post operative period is associated with low ulcer recurrence as reported by other workers.[3,17] The mortality rate of 17.1% is comparable to reports from Ghana and western Nigeria[12,13], but high when compared to western series[18]. This may be because in the western series, the patients present early even though they are usually of advancing age.

In conclusion, despite great advances in the understanding of the aetiology of uncomplicated duodenal ulcer, perforated duodenal ulcer continues to be a controversial subject. Its aetiology is not clearly established and the rate of perforation has remained the same as decades ago, requiring an urgent surgical intervention, the choice of which is not entirely settled. However, simple closure remains the selected treatment option in the majority of patients who present with perforated duodenal ulcer. The operation is simple, quick to perform and safe in the hands of most surgeons; moreover, it can be complemented with an effective medical treatment which includes the eradication of *Helicobacter pylori* to prevent recurrence.

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