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Research Article

Management of Perforated Peptic Ulcer: A Two Years Multicenter Audit of Attitude and Outcome in Yaoundé

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Abstract

Background: Perforated peptic ulcers are serious abdominal emergencies with high morbidity and a mortality rate that ranges from 1.3 to 20%. While laparoscopy remains the gold standard, open surgical treatment remains the most practiced treatment modality in our context. The techniques used are either simple repair, repair with an omentum patch, repair with a free (Graham) or pedicled omentum patch (Cellan-Jones). The aim of this study was to compare surgical techniques for the treatment of PPU in terms of mortality and other patient-relevant outcomes.

Methods: This is a 2-year cohort study on the surgical management and early outcomes of perforated peptic ulcer. Intra operative data was collected on the approach, perforation size and repair technique. Patients were followed up in the post operatory period to evaluate the outcomes.

Results: A total of 26 patients were operated and followed up for PPU (96.2% males). Open surgery was realized in 24 cases (92.3%) and laparoscopy in 2 cases (7.7%). %). Repair with omentum patch was the most used surgical technique accounting for 22 cases (84.6%), followed by simple repair in 3 cases (11.5%) and Graham's plug in 1 case (3.8%). We had post operatory complications in 18 (75%) open surgery cases and simple outcome in 6 cases (25%), meanwhile one of the two laparoscopic cases had a simple outcome. Post operatory leakage occurred in 6 cases (23.1%) including 1 case done by simple repair, 4 cases done by repair with omentum patch and 1 case done by Graham's plug. Two (33.3%) of the leakage cases closed spontaneously with medical management after ensuring the absence of intra-abdominal collection with sn abdominal ultrasound. Four (66.7%) of the leakage cases were re-operated following unsuccessful medical management. Parietal suppuration occurred in 14 cases (53.8%). The mortality rate of this study was 15.4% (4 cases) including two intra-operative deaths and two deaths in the intensive care unit following surgery.

Conclusion: Perforated peptic ulcer remains a serious surgical emergency in our context with a mortality rate attaining 15.4%. Repair and omentum patch remains the most used surgical technique and there is no relationship between surgical technique and post operatory complications and/or mortality.

Keywords: Laparoscopic Surgery; Open and, Post Operatory Complications; Perforated Peptic Ulcer; Surgical Management

Introduction

Peptic ulcers are common, with a lifetime prevalence of 5%–10% and an incidence of 0.1%–0.3% per year [1]. They result from a damaging effect of acid and digestive enzymes on the mucosa of the stomach and duodenum [2]. Despite the decrease in hospitalisation and mortality rates over the past 30 years, complications (such as perforations and bleeding) occur in 10%–20% of patients [3]. Perforated Peptic Ulcers (PPU) are serious abdominal emergencies with a mortality rate that ranges from 1.3 to 20% [4]. PPU can be treated by open surgery, laparoscopy, combined endoscopic and interventional radiological procedures, combined endoscopic and laparoscopic procedures, as well as conservative approaches. While laparoscopy remains the gold standard, open surgical treatment remains the most practiced treatment modality. The techniques used are either simple repair, repair with an omentum patch, repair with a free (Graham) or pedicled omentum patch (Cellan-Jones). Despite various treatment options, postoperative complications such as sepsis, intra-abdominal abscess, wound dehiscence, incisional hernia, leakage, pneumonia and ileus occur in approximately 30% of the patients.[3, 5]. Peptic ulcers continue to be a significant health problem that can demand significant financial resources and involve multiple disciplines [2]. The aim of this study was to describe the current clinical management and draw relevant points that can help in operative decisions and improve outcome, to compare surgical techniques for the treatment of PPU in terms of mortality and other patient-relevant outcomes.

Materials and Methods

A 2-year cohort study on the surgical management and early outcomes of perforated peptic ulcer was carried out in three referral hospitals in Yaoundé, namely; Yaoundé university teaching hospital, Yaoundé Central hospital and Essos Hospital Center from June 2022 to June 2024. All patients diagnosed with perforated peptic ulcer were recruited into the study. Their demographic and clinical data were recorded, appropriate resuscitation, pre-operatory work ups and anesthetic consultations were done. The patients were classified based on the American Society of Anesthesiology (ASA) score. Intraoperatively, the size of the perforation and the repair technique were noted. Copious peritoneal lavage was done using normal saline and all gastric ulcers were taken a biopsy of the border of the ulcer in a systematical manner, and peritoneal fluid samples were taken for culture and sensitivity analysis. We included all patients undergoing operations with an intraoperative confirmed diagnosis of perforated peptic ulcer. Those who were operated in other hospitals and later referred to our hospitals were excluded from the study. The patients were followed up in the post-operative period and complications were noted and classified according to Clavien-Dindo. Post operatory complications were diagnosed clinically and radiologically using ultrasonography or CT scan. The data was entered into EpiData and analyzed using Spss version 16. Data were presented in proportions and frequency tables for categorical variables. To summarize the data for continuous variables, we utilized ranges, medians, and Inter-Quartile Ranges (IQRs). We computed P values for categorical variables using the Odds Ratio (OR) and its 95% Confidence Interval (CI). We determined the variables associated with the outcome using logistic regression, and to adjust for confounding variables, we used multivariate logistic regression and direct standardization techniques. The significance was defined as a P value of 0.05 or less (Figure 1).

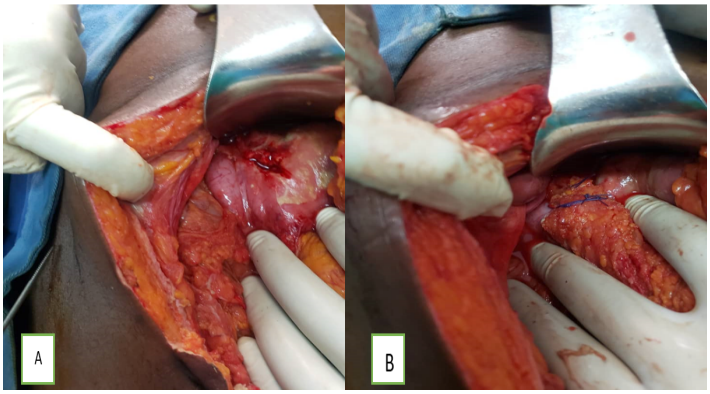

Figure 1: Images of gastric perforation by open surgery before (A) and after (B) repair with omentum patch.

Results

A total of 26 patients were operated and followed up for PPU. The ages ranged between 13 and 65 and the mean age was 40.54 years. 25 (96.2%) of the patients were male and one was female (3.8%). Open surgery was realized in 24 cases (92.3%) and laparoscopy in 2 cases (7.7%). In 22 cases (84.6%), the perforation was ≤2cm and >2cm in 4 cases (15.4%). Repair with omentum patch was the most used surgical technique accounting for 22 cases (84.6%), followed by simple repair in 3 cases (11.5%) and Graham's plug in 1 case (3.8%). We had post operatory

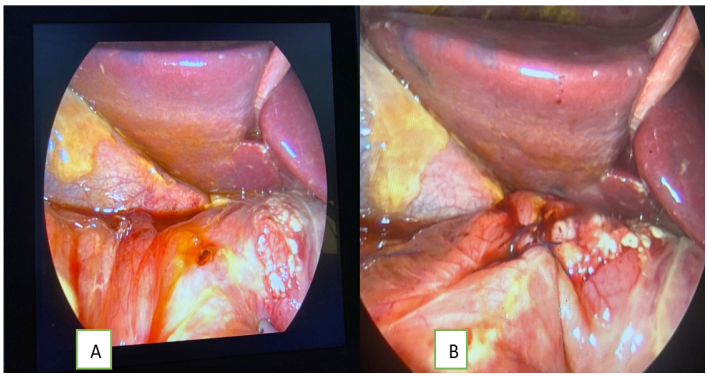

Figure 2: Images of gastric perforation by laparoscopy before (A) and after (B) repair.

Complications in 18 (75%) open surgery cases and simple outcome in 6 cases (25%), meanwhile one of the two laparoscopic cases had a simple outcome. These complications mostly included: leakage and parietal suppuration. Post operatory leakage occurred in 6 cases (23.1%) including 1 case done by simple repair, 4 cases done by repair with omentum patch and 1 case done by Graham's plug. Two (33.3%) of the leakage cases closed spontaneously with medical management after ensuring the absence of intra-abdominal collection with an abdominal ultrasound. Four (66.7%) of the leakage cases were re-operated following unsuccessful medical management. Parietal suppuration occurred in 14 cases (53.8%). The mortality rate of this study was 15.4% (4 cases) including two intra-operative deaths and two deaths in the intensive care unit following surgery. There was no relationship between surgical techniques and post operatory complications according to Clavien-Dindo. The difference in the post operatory outcomes between laparoscopy and open surgery were in terms of surgical site pain and length of hospital stay which were lesser in laparoscopic cases, with no difference in post operatory complication.

Discussion

Despite the fact that perforated peptic ulcer disease is a common surgical emergency and that eradication of Helicobacter pylori has resulted in a vast decline in peptic ulcer prevalence, the number of patients requiring surgery has remained relatively constant [6]. The positive link between tobacco smoking, crack/cocaine use, with or without alcohol consumption, and PPU has been reported by several researchers [7-10] and this may partly explain the male preponderance in our study. The higher incidence of PPU in the middle-aged and elderly patients may be related to increased, unregulated use of Nonsteroidal Anti-Inflammatory Drugs (NSAIDS) and steroids in this population. Published studies indicate that both groups of drugs increase the risk of PPU [7,9,10]. Indeed, about 25%of chronic NSAID users will develop Peptic Ulcer Disease (PUD) and 2-4% will bleed or perforate ultimately [8-11]. Majority of the perforations were ≤2cm (84.62%) and repair with omentum patch was the most used surgical technique (Table 2). Seventy-seven percent (77%) of patients presented within 24h following perforation as opposed to 23% who presented after 24h (Table 1). This result differs from those of other studies in the region which had most patients with delayed presentation of the disease; this could be explained by the fact that our study was carried out in an urban area where people have easy access to health facilities whereas in the other studies most patients arrived from remote areas where proper facilities of health care and health education are not available and the patient might come to the hospital in an advanced stage of the disease [12,13,14] A total of 6 surgeons operated the patients in this study and two of the surgeons practice laparoscopic surgery with much ease. It should be noted that these surgeons decided to operate most of the patients by open surgery despite their laparoscopic skills. This decision could be explained by the desire to have a clearer view of the abdomen, realize the surgical gesture perfectly to ensure a good recovery of the patients, given the high morbidity and mortality of the pathology.

Duration of perforation	Number of patients	Frequency	Mortality
<6H	8	30.80%	0
6-24H	12	46.20%	0
>24H	6	23%	4
TOTAL	26	100%	4

Table 1: Relationship between duration of perforation and mortality.

	Frequency	Percent	Valid Percent	Cumulative Percent
Simple repair	3	11.5	11.5	11.5
Repair with patch	22	84.6	84.6	96.2
Graham's plug	1	3.8	3.8	100
Total	26	100	100	

Table 2: Surgical Techniques.

Leaked repair after laparotomy for PPU is a global phenomenon, though rates vary from region to region and within regions

[15,16,17]. It ranges between 3-30% [15,17,18,19]. In a Danish study involving a large series of 726 patients operated for PPU, 124 (17.1%) underwent re-laparotomy and persistent leak was the most frequent indication [17]. In India [20], leaked repair rate was 14.0% akin to a rate of 11.3% quoted in a referral hospital in Pakistan [18], 10.9% in Ethiopia [15] and 15.4% observed in this study. In Egypt and Iran, lower rates of 3.9% and 4.0%, respectively, were quoted [20,21]. Reasons adduced for lower rate in Iran may be related to retrospective nature of the study, exclusion of malignant and trauma cases, and abhorrence of alcohol intake (Islamic nation) [21]. Leakage occurred in 23.1% of our cases, and this results falls within the global range. Over the years, the debate to operate or withhold relaparotomy in the event of leaked repair has continued [18, 22,23]. Recently, published data favor re-laparotomy-on-demand strategy [18,21,23,24,25]. Hitherto, criteria for performing relaparotomy are not explicit and are based on nonquantitative, subjective arguments or hospital doctrine [21,23,24,26]. However, emerging clinical data indicate that prompt abdominal imaging studies, especially Computed Tomography (CT) of the abdomen, represent the gold standard for early detection of leaked repair [23]. This tights with our study as we managed 33.3% of our leakages medically with ultrasound as the main imaging technique. Parietal suppuration was the most common complication in our study (53.8%) and is in agreement with other studies [27,28].

The reason for the high rates of surgical site infection was due to heavy contamination of the wound due to the severe bacterial peritonitis. This is indicative of possible parietal issues such as evisceration and incisional hernia that may need to be addressed in the future. All cases of death were recorded among patients who presented >24h following perforation (table 1). The problem with delayed presentation is in two phases. First, in the preoperative period, it predisposes the patient to insults by both local and systemic effects of acute-phase reactants [29,30,31]. In the peri and postoperative phases, patients in this category have high anaesthetic risks with poor hemodynamic performance and are prone to sepsis, organ dysfunction and leaked repair [18,29,30, 31]. These can result to death as was the case in our study. Second, delayed presentation often leads to advanced disease with significant intra-peritoneal soilage, and weak and cheesy gastro-duodenal wall that predisposes to insecure closure and difficult laparotomy [16,18,31,32,33]. The deceased patients were operated by the technique of repair and omentum patch. Nevertheless, there was no association between the surgical technique and post operatory complications or mortality. This result could be explained by the fact that repair and omentum patch is the most used technique in our setting. There was no direct relationship between the duration of nasogastric tube and the favourable outcome of the patients. This result are important for surgical practice in our context, as most surgeons today tend to abandon the old dogma of keeping a nasogastric tube for many days. There was no relationship between surgical techniques and post operatory complications according to Clavien-Dindo. The difference in the post operatory outcomes between laparoscopy and open surgery were in terms of surgical site pain and length of hospital stay which were lesser in laparoscopic cases, with no difference in post operatory complications but we have to recognize few cases of laparoscopic approach. This results are similar to those obtained by Mansour and colaborators in Egypt [34] (Table 3,4).

Complication	Clavien-Dindo Classification	Frequency
Parietal Suppuration	Grade II	53.80%
Leakage managed medically	Grade II	7.70%
Leakage managed surgically	Grade III B	15.40%
Mortality	Grade V	15.40%

Table 3: Complications According to Clavien-Dindo.

Count							
		Clavien-Dindo					Total
		0	1	2	3	5	
Surgical technique	Simple sutures	0	1	1	0	0	2
	Suture with patch	6	6	3	3	4	23
	Graham patch	0	0	0	1	0	1
Total		6	7	4	4	4	26

Table 4: Comparison between surgical technique and post operatory complication according to Clavien-Dindo.

Conclusion

Perforated peptic ulcer remains a serious surgical emergency in our context with a mortality rate attaining 15.4%. Repair and omentum patch remains the most used surgical technique and there is no relationship between surgical technique and post operatory complications and/or mortality. Parietal suppuration dominates the list of post operatory complications followed by leakages. This makes abdominal drainage a secured attitude for the un-experienced surgeon. Delayed presentation remains a major mortality factor in PPU. The duration of nasogastric tube after surgery doesn't favour the evolution of the patient.

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Ethical Guidelines

An ethical clearance was obtained from the ethical committee of the Faculty of Medicine and Biomedical Sciences of the University of Yaoundé I and authorization was gotten from the various hospitals.

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