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**Background:** Published reports on perforated peptic ulcers indicate increasing rates for the elderly, those chronically ill and females. Our local observations are at variance. This study analysed patients treated for peptic ulcer perforations at the Kenyatta National Hospital between January 2005 and December 2006.

**Methods:** Clinical charts for patients admitted and treated for perforated peptic ulcer disease were reviewed. Data sought included patient demographic data, clinical presentation, and time from onset of symptoms to treatment, operative findings and treatment complications. The determinants of post-operative complications were evaluated using univariate analysis.

**Results:** Forty four patients with perforated ulcers were admitted and treated over a two year study period. Twenty eight were analyzed (retrieval rate 63.6%). Males (86.2%) and those 35 years of age and younger (57.1%) predominated. Alcohol, smoking and prior use of non steroidal anti inflammatory drugs were respectively documented in 39.3%, 39.3% and 10.7% of patients. The complication rate was 25%. Four patients died. The factors significantly related to complications was treatment delay ( $p=0.007$ ) and acute perforation (0.027)

**Conclusion:** Perforated peptic ulcer disease is a disease of young males. Efforts to reduce delay in presentation in this population may reduce the complications.

## Introduction

The introduction of antisecretory drugs in 1970 and later, proton pump inhibitors have, in addition to eradication of *Helicobacter Pylori* infection, changed both the treatment and outcome of peptic ulcer disease<sup>1,2,3,4</sup>. Although the rate of elective peptic ulcer surgery has dramatically reduced as a result, emergency operations for perforations have remained constant or increased<sup>2,5</sup>. The mainstay of treatment in perforations has remained the omental patch repair with peritoneal lavage<sup>6,7</sup> although laparoscopic repairs are being popularized in some institutions<sup>8,9,10,11,12</sup>. Published reports on perforated peptic ulcer disease, especially from Western countries, indicate higher rates of perforations for the elderly, those chronically ill and an increasing female involvement<sup>5</sup>. Our local observations do not seem to support this trend in admissions. The aim of this study was to describe the pattern of perforated peptic ulcers (PPU) at the Kenyatta National Hospital in Nairobi over a 2-year period.

## Patients and Methods

This was a retrospective review of patients operated for peptic ulcer perforations Kenyatta National Hospital (KNH) in Nairobi from January 2005 to December 2005. KNH is the main national referral hospital. The 2,000 bed hospital is also the teaching facility for the University Of Nairobi School Of Medicine. Clinical charts of 44 patients operated for perforated peptic ulcer from January 2005 to December 2006 were reviewed. Sixteen cases were excluded from this study because of incomplete patient and clinical data in their charts. The surgical procedure for all the patients involved refreshing the perforation, repair with interrupted sutures, placement of a Graham patch and peritoneal lavage. Data extracted included demographic data, clinical presentation, and time from symptom onset to treatment, risk factors and in-hospital complications. The information was entered in pre-coded data sheets and summarized in the form of proportions and averages. The complication groups (present or absent) were compared for the prevalence of risk factors, gender groups, treatment delays and age. The  $X^2$  analysis and the Fisher's exact tests were used for categorical and continuous data as appropriate.

## Results

Out of the 44, 28 patients (retrieval rate of 63.6%) had complete data and were analyzed. The male to female sex ratio was 8.3:1. The patients' ages ranged from 11 to 78 with a median of 35.4 years. The majority (57.1%) of patients were aged 35 years and younger (Table 1). The patients' occupations included semiskilled casual laborers, students, informal businesses and the unemployed. The most common presenting complaints were sudden onset abdominal pain and vomiting. The duration of symptoms ranged from 1 to 14 days, the mean duration was 7.5 days. Three patients (10.7%) gave a history of regular ingestion of non-steroidal anti-inflammatory drugs for joint and back pains. Other risk factors recorded included alcohol consumption in 11 patients and smoking in 11 patients as well. Most patients who smoked also took alcohol. A similar proportion of patients (39.3%) reported previous treatment for peptic ulcer disease.

Patients with a previous history of PUD (peptic ulcer disease) had had symptoms for durations ranging from 2 to 28 years. The treatment pattern was predominantly the use of variety of antacid mixtures for symptomatic relief. One patient was presenting with a re-perforation. Most of the perforations were anterior and duodenal (Table 1).

Histology of the biopsy specimens revealed no malignancy. There were 9 reported chronic ulcers and 16 acute ulcerations. All biopsies were not stained for *Helicobacter Pylori*. There were 4 deaths out of 28 cases, giving a 14.3% mortality rate. Complications were recorded in 7 patients (25%). These complications included 3 cases of wound sepsis, 3 re-perforations/leaks and 1 re-operation for burst abdomen. Five patients had blood transfusion ranging from two units to six units of whole blood.

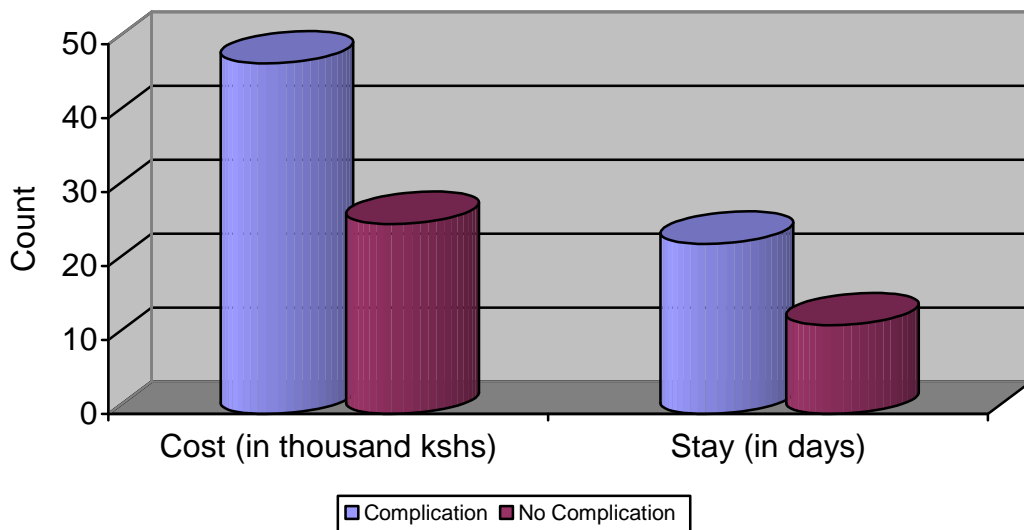
**Table 1.** Patient and Peptic Ulcer characteristics

Characteristic	Number of patients	%
Gender		
<b>Female</b>	<b>3</b>	10.7
<b>Male</b>	<b>25</b>	89.3
Age		
<b>&lt; 35 years</b>	<b>16</b>	57.1
<b>36-50</b>	<b>6</b>	21.4
<b>&gt; 50</b>	<b>6</b>	21.4
Site of Perforation		
<b>Anterior duodenal</b>	<b>25</b>	89.3
<b>Posterior duodenal</b>	<b>1</b>	3.6
<b>Gastric</b>	<b>2</b>	7.1
Nature of Perforation		
<b>Acute</b>	<b>16</b>	57.1
<b>Chronic</b>	<b>9</b>	32.1
<b>Not Specified</b>	<b>3</b>	10.7
Risk factor present		
<b>Alcohol</b>	<b>11</b>	39.2
<b>Smoking</b>	<b>11</b>	39.2
<b>NSAIDS</b>	<b>3</b>	10.7
<b>Previous PUD</b>	<b>11</b>	39.2
Duration of symptoms		
<b>&lt; 24 hrs</b>	<b>5</b>	23.8
<b>24-48 hrs</b>	<b>4</b>	19.0
<b>&gt; 48 hrs</b>	<b>12</b>	57.1
<b>Not Specified</b>	<b>7</b>	

**Table 2.** Univariate analysis for complication groups

Complication No complication				P value
Previous PUD	Yes	1	10	0.191
	No	6	11	
Age	< 35	4	12	NS
	> 35	3	9	
Smoking	Yes	2	9	0.668
	No	5	12	
Treatment delay	< 48 hours	0	9	0.007
	> 48 hours	7	5	
Nature of ulcer	Acute	7	9	0.027
	Chronic	0	9	
Alcohol use	Yes	2	9	0.668
	No	5	12	

**Fig. 1** Complication groups by cost and length of stay



Four of the 5 patients who received blood transfusion died. The factors which were significantly associated with complications were treatment delay ( $p=0.007$ ) and acute perforation ( $p = 0.027$ ) (Table 2). The age, previous history of PUD and other associated risk factors did not significantly influence the rate of complications. The duration of hospital stay ranged from 3 days to 79 days with an average of 15 days. The associated treatment cost was Kshs 29,701.409

(range 5,580-77,150 Kshs). The treatment cost was higher for the group of patients who developed complications. (Figure 1). Patient follow-up was poor. Only 5 patients (17.8%) revisited the surgical outpatient clinic for post-operative evaluations.

## Discussion

The observations of the current study indicate a predominant male association for perforated peptic ulcer disease. The patients presented late with attendant significant morbidity and mortality. The delay was also associated with increased cost of treatment and lengths of stay. The mortality rate of 14.3% in this study is higher than the 2.7 to 13.8% rates reported by Boey et al<sup>13</sup>. This high rate may be attributed to the long time interval between perforation and initiation of treatment. The majority (57%) of patients in our study had treatment 48 hours after the onset of symptoms. The reasons for the treatment delays were not clear. This could have both pre-hospital and intra-hospital components. Patient choices are an important cause of treatment delays. Hospital treatment is expensive and the patients may seek care only when the pain is unbearable. Patients may take medications in the pre-hospital period with hope that the symptom will abate. It is also possible that some clinicians managing the patients initially may not have considered perforation as a possible diagnosis. The specific patterns and reasons for delay need to be investigated.

The predominance of young males in the present study is similar to other studies from the developing world. For instance, Tessema et al<sup>14</sup> in Ethiopia found a mean age of 32.6 years and a male to female sex ratio of 7.2:1. As expected, most of the perforated ulcers were in the anterior duodenum. The duodenum within 1-2 cm of the pylorus is the first portion of the intestine first exposed to gastric secretions. Only 3.6% of perforations were identified as posterior duodenal. Studies indicate that the latter site is associated with brisk haemorrhage from the gastroduodenal artery that may manifest with volume depletion and higher complication and mortality<sup>15</sup>.

The choice of operative procedure in the current series was limited to omental Graham patch repair. Although this procedure has been associated with ulcer recurrence rates of up to 40%, the significant side effects of definitive ulcer surgery (dumping in 50% and diarrhea in 10%)<sup>16</sup> and the advent of efficacious medical treatment (proton pump inhibitors, H<sub>2</sub> receptor blockers H. pylori eradication), and triple therapy, the patch repair will remain popular. Incidence of H. pylori peaks 80-92% in patients with perforation<sup>17</sup> and its eradication is pivotal. In one randomized study, patients put on PPI alone were compared to those whose therapy included H. pylori eradication. The recurrence rates were 38.1% and 4.8%, one year after simple closure of duodenal perforation<sup>17</sup>. For the group of patients in the current study, definitive acid-reducing procedures (gastric resection or vagotomy and pyloroplasty) were not an option because of the late-presentation. These procedures are contraindicated in patients who are hemodynamically unstable, have diffuse peritonitis or have multiple co-morbid conditions<sup>15</sup>. No patient underwent laparoscopic repair. Established in the 1990s, studies have confirmed its efficacy for small perforations<sup>18</sup>. It offers advantages in terms of reduced analgesic requirements, faster return to oral feeding, faster return to normal daily activities and reduced morbidity and chest complications.

## Conclusion

Perforated peptic ulcers are a disease of young males, risk factors were documented for significant proportion of patients. Efforts to reduce delay in presentation in this population may reduce the complications.

## References

1. Jibril JA, Redpath A, Macintyre IM. Changing pattern of admission and operation for duodenal ulcer in Scotland. *Br J Surg* 1994; 81:87–9.
2. Fineberg HV, Pearlman LA. Surgical treatment of peptic ulcer in the United States: trends before and after the introduction of cimetidine. *Lancet* 1981;i: 1305-7.
3. Paimela H, Oksala NKJ, Kivilaakso E. Surgery for peptic ulcer today. *Dig. Surg.*2004; 21:185-91.
4. Svanes C. Trends in perforated peptic ulcer: incidence, etiology, treatment, prognosis. *World j. surg* 2000;24; 277-83.
5. Donovan AJ, Berne TV, Donovan JA. Perforated duodenal ulcer: an alternative therapeutic plan. *Arch Surg.* 1998;133:1166-1171.
6. Graham RR. Treatment of perforated duodenal ulcers. *Surg Gynecol Obstet* 1937;64:235.
7. Karanjia ND, Shanahan DJ, Knight MJ. Omental patching of a large perforated duodenal ulcer: a new method. *Br J Surg* 1993;80:65.
8. Arrillaga A, Sosa JL, Najjar R. Laparoscopic patching of crack cocaine-induced perforated ulcers. *Am Surg* 1996;62: 1007–1009.
9. Lau WY, Leung KL, Zhu XL, et al. Laparoscopic repair of perforated peptic ulcer. *Br J Surg.* 1995;82:814-816.
10. Druart ML, Van Hee R, Etienne J, et al. Laparoscopic repair of perforated duodenal ulcer: a prospective multicenter clinical trial. *Surg Endosc.* 1997; 11:1017-1020.
11. Siu WT, Leong HT, Li MK. Single stitch laparoscopic omental patch repair of perforated peptic ulcer. *J R Coll Surg Edinb.* 1997;42:92-94.
12. Katkhouda N, Mavor E, Mason RJ, et al. Laparoscopic repair of perforated duodenal ulcers: outcome and efficacy in 30 consecutive patients. *Arch Surg.* 1999;134:845-848.
13. Boey J, Samuel KY et al Risk stratification in perforated duodenal ulcer. *Ann Surg* 1987; 205:22-26.
14. Tessema E, Meskel Y, Kotiss B .Perforated peptic ulcer in Tikur Anbessa Hospital. *Ethiop Med Journal.* 2005; 43(1):9-13.
15. Sharma, Smita S. Mamtani, Manju R. et al A prospective cohort study of postoperative complications in the management of perforated peptic ulcer. *BMC Surgery.* 2006; 6:8,
16. Sevel S, Ananthkrishnan N, Kate V. Role of histamine-2 receptor antagonists after simple closure of perforated duodenal ulcer—a double blind randomised, controlled study. *Trop Gastroenterol* 1996; 17: 227–229.
17. Ng EK, Lam YH, Sung JJ, et al. Eradication of helicobacter pylori prevents recurrence of ulcer after simple closure of duodenal ulcer perforation: randomized controlled trial. *Ann Surg* 2000; 231: 153.
18. Siu WT, Leong HT, Law BKB, et al. Laparoscopic repair for perforated peptic ulcer: a randomized controlled trial. *Ann Surg* 2002; 235: 313–319.