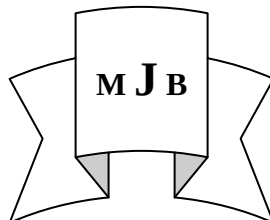


A Study on the Mortality and Morbidity of Perforated Duodenal Ulcer in Al Hilla Teaching Hospital

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Abstract

Background: Perforated peptic ulcer disease was rare in the 19th century but demonstrated a rise with the start of the 20th century. There had been a change in the treatment of perforated peptic ulcer disease from simple suturing to vagotomy and later to gastrectomy and finally the return to simple suturing combined with eradication treatment for H pylori. After the discovery of proton pump inhibitors (PPI), the incidence of peptic ulcer disease (PUD) seems to be decreasing but perforated peptic ulcer disease remains either stable or increased. The objective of the study was to identify risk factors for mortality and morbidity following the event of perforated PUD and ways to avoid them.

Methods: 34 patients with perforated duodenal ulcers in the emergency department of Al-Hilla Teaching Hospital who had been treated surgically by Graham patch followed by eradication treatment of H pylori between the 1st of March 2008 and the 5th of January 2012 had been studied prospectively recording intra and postoperative mortality and morbidity, history of smoking, non steroidal anti inflammatory analgesics (NSAIA), history of dyspepsia and the risk factors for the complications.

Results: Males constituted 21(61.7%) of our 34 patients. NSAIA and smoking were recorded in 12(35.3%) and 17(50%) of the patients respectively. 26 (76.4%) of the patients had been discovered to have duodenal ulcer (DU) for the 1st time with no previous history. 31(91.2%) of the patients had air under the diaphragm on chest x ray in standing position. 10(29.4 %) of the patients presented early to hospital (within one day of abdominal pain) while 21(61.8%) presented late and 3(8.8%) very late. Most of the patients recovered completely postoperatively without complications. 3(8.8%) had leaks from the repair and unfortunate death happened in only one (3%). 21(61.7%) had been referred from a general practitioner or another specialty of medicine before coming to the surgical department and a delay of more than 24 hours happened in 15 of these patients.

Conclusion: Perforated duodenal ulcer is a potentially-fatal disease that has to be dealt with abruptly once diagnosed. Care must be taken to prevent the complications especially in those who are elderly or have a comorbid illness as these are the people at risk. Delay in the diagnosis usually happens in the peripheral hospitals and by medical specializations other than surgery.

الخلاصة

الخلفية: لقد كانت حالات قرحة الاثني عشري المنفجرة نادرة في القرن التاسع عشر ولكن تم تسجيل زيادة في الحالات مع بداية القرن العشرين . لقد تغير علاج القرحة المنفجرة من الخياطة البسيطة الى قص العصب القحفي العاشر ثم استئصال المعدة واخيرا العودة الى الخياطة البسيطة للقرحة مع العلاج الثلاثي لبكتريا هيليكوباكتر بايلوري. بعد اكتشاف مثبطات قنوات البروتون تم تسجيل انخفاض في حالات قرحة الاثني عشري ولكن حالات القرحة المنفجرة اما زادت او بقيت على نفس نسبها . الهدف من هذه الدراسة هو اكتشاف العوامل التي قد تزيد المضاعفات والوفيات بعد حدوث انفجار القرحة وطرق الوقاية منها.

الطرق: ٣٤ مريض من الذين راجعوا مستشفى الحلة التعليمي العام وكان لديهم قرحة الاثني المنفجرة تم علاجهم جراحيا بطريقة رقعة غراهام ومكافحة بكتيريا هيليكوباكتر بايلوري ما بين ٢٠٠٨/٣/١ و ٢٠١٢/١/٥ ودراستهم مستقبليا مع تسجيل المضاعفات والوفيات بعد العملية والتدخين واستخدام المسكنات و تاريخ المرض من ناحية عسر الهضم و العوامل المعرضة للمضاعفات.

النتائج: يشكل الرجال ٢١ (٦١.٧%) من مرضى البحث. تناول المسكنات والتدخين تم تسجيله في ١٢ (٣٥.٣%) و ١٧ (٥٠.٠%) من المرضى. ٢٦ (٧٦.٤%) من المرضى تم اكتشاف القرحة عندهم لأول مرة أثناء العملية دون وجود تاريخ سابق للمرض. ٣١ (٩١.٢%) من المرضى كان لديهم هواء تحت الحجاب الحاجز عند اخذ اشعة الصدر بوضع الوقوف. ١٠ (٢٩.٤%) من المرضى راجعوا المستشفى مبكرا (خلال يوم واحد من الام البطن) بينما ٢١ (٦١.٨%) راجعوا متاخرين و ٣ (٨.٨%) متاخرين كثيرا. معظم المرضى تعافوا بصورة كاملة دون مضاعفات. ٣ (٨.٨%) حدث عندهم تسريب من مكان الخياطة وحدثت الوفاة في حالة واحدة فقط. ٢١ (٦١.٧%) تم احوالهم من ممارس عام او اختصاص اخر غير جراحي الى الردهة الجراحية وتم تاخير ١٥ من هؤلاء المرضى اكثر من ٢٤ ساعة. الاستنتاج: قرحة الاثني عشري المنفجرة مرض مميت يجب التعامل معه بسرعة عند تشخيصه. يجب اخذ الحيطة لتجنب المضاعفات خاصة لدى الكبار في السن والاشخاص المصابين بامراض اخرى. التأخير عادة ما يحدث في مستشفيات الاطراف ومن قبل اختصاصات طبية اخرى.

Introduction

During the 19th century peptic ulcer disease (PUD) was a rare disease and had demonstrated a rise in its incidence with the start of the 20th century. Since then, the world has seen an epidemic of duodenal perforations among young males that seems to be waning [1-3].

The 1st documented surgical treatment for perforated DU was by Mikultz in 1885 who sutured a perforated gastric ulcer and the patient died. While the 1st successful suturing of a perforated peptic ulcer was performed by Barker in 1896 [4]. Then Von Haberer performed gastric resection in 1919 and after that, this procedure had been used extensively by many surgeons [5,6]. During the 1970s and 1980s vagotomy with suturing of the perforation had been an alternative method for the treatment of perforated PUD [7].

Laparoscopic surgery had been introduced recently in many centers over the world for the treatment of PUD [8,9].

Conservative treatment of perforated PUD can also be advocated in certain circumstances [10]:

1. The patient is haemodynamically stable.
2. Perforation lasting > 24 hours.

The introduction of antibiotics in the 1950s reduced the postoperative morbidity and mortality of perforated PUD [11].

Nowadays suturing the perforation directly or using Graham patch followed by eradication of H. Pylori has become the standard treatment of perforated PUD with minimal recurrence rate [12,13].

In the mid 80s, there had been two revolutionary steps: The 1st was the discovery of the relationship of H. Pylori with PUD and the 2nd was the discovery of proton pump inhibitors (PPI). Ever since, the incidence of PUD seems to be declining. However the incidence of PUD complications, on the contrary, seems to be stable or rising and the relationship between H. Pylori and PUD complications is not settled yet. Other factors like smoking and NSAIA seem to play a more important role in this complication [14, 15].

Another aspect of paramount importance is to identify the patients susceptible to mortality and morbidity following perforation of PUD and certain criteria seem to be important in this [4, 16]:

1. Delay in treatment > 24 hours
2. Comorbid illness

3. Shock on presentation (systolic blood pressure < 90mmHg)

Patients and Methods

34 patients presented with acute abdomen to Al Hilla Teaching Hospital, proved to be perforated DU by surgery, had been studied prospectively after recording the history of smoking, NSAIA intake, past history of dyspepsia, epigastric pain, melena, pre, intra and postoperative findings in the period between the 1st of March 2008 and the 5th of January 2012. Surgery had been performed to these patients using the Graham patch technique (applying an omental patch over the ulcer and suturing three interrupted catgut sutures over the ulcer and patch) or the modified Graham patch technique in case of large ulcers more than 1 cm in diameter (suturing the catgut sutures over the ulcer and then over the omental patch) . After that, peritoneal lavage had been performed and two tube drains applied one subhepatic and the other in the pelvis. A 30 Fr nasogastric tube is left into the stomach with intermittent suction until the patient starts oral diet on the 5th day. During the hospitalization period, patients received antibiotics (cefotaxime or ceftriaxone and metronidazole), iv fluids and H2 antagonists. After discharge from hospital on the 6th postoperative day, patients were put on triple therapy (PPI, metronidazole and clarithramycin for 2 weeks).

Results

Thirty four patients who had surgeries for perforated DU in the emergency department of Al Hilla Teaching Hospital in the period between the 1st of March 2008 and the 5th of January 2012 had been studied prospectively. Most of

the patients were of the low socioeconomic class. The median age of the patients was 50.4(range 23 – 95) years. 21(61.7%) were males and 13(38.2%) were females. Male: female ratio was 1.76: 1. 12 (35.2%) of the patients had a past medical history of taking NSAIA. 17(50%) of the patients were smokers. 8 (23.5%) of the patients had previous history of either DU or chronic gastric upset while 26 (76.4%) had been discovered to have DU for the 1st time with no previous complaint. The diagnosis had been made depending on the history (the characteristic sudden onset epigastric pain), physical examination (board like rigidity and tenderness) and two main investigations (ultrasonography of the abdomen, if available, since many of the patients come late at night and chest x ray). Ultrasonography had been performed in 24 (70.5%) of the patients showing moderate to large amount of free peritoneal fluid in all. Chest x ray standing position showing the diaphragm had been performed in all of the patients showing air under diaphragm in 31 (91.2%) of them and 4 (11.7%) had multiple air fluid levels. 10 (29.4%) presented to the hospital early (within one day of the abdominal pain) while 21(61.8%) presented late (2-5 days after the start of the pain) and 3(8.8%) presented very late (after 7- 10 days). 4(11.7%) had haematemesis and melena. Regarding concomitant chronic diseases, (5 patients had diabetes mellitus, 4 had hypertension, 1 had tuberculosis and 1 had chronic renal failure). 4(11.7%) were shocked on admission (systolic blood pressure <90 mmHg) .In regards to recurrence one had previous history of perforated DU two years previously that had been treated conservatively. The mean hospital stay for the patients was

10 days. 21(61.7%) had been referred from a general practitioner or another specialty of medicine before coming to the surgical department and a delay of more than 24 hours happened in 15 of these patients.

Intraoperative findings

All of the ulcers had been found to be anterior.

3(8.8%) of the ulcers had been found to be sealed at the time of surgery.

Diameter of the ulcers ranged 4-15 mm (average 7mm).

Colour of intraperitoneal fluid:

Bile stained	14 (41.2%)
Serosanguineous	13(38.2%)
Coffee ground	4(11.7%)
Purulent	3(8.8%)

Total 34(100%)

Postoperative Complications:

Most of the patients recovered completely postoperatively without complications. Gastroenteritis happened in 4(11.7%) of the patients on the 2nd postoperative day. Subphrenic abscess occurred in one patient on the 10th postoperative day and had been treated conservatively with antibiotics and repeated ultrasonography. Burst abdomen (wound dehiscence) happened in one on the 8th postoperative day and had been treated using tension sutures.

Postoperative leak:

3(8.8%) had leaks from the repair. This event occurred on the 5th postoperative day in all 3. In one of them the subhepatic drain discharged 700 cc on the 5th postoperative day, 300 cc on the 6th day, 400 cc on the on the 7th day and stopped on the 8th day. This patient discharged from hospital on the 10th day with no other event and recovered well on the conservative treatment. The 2nd patient had the leak also on the 5th day but continued to discharge 600-700 cc

bile stained fluid from the subhepatic drain and a redo surgery had to be performed in this patient who developed wound infection and the patient became well after that. The 3rd developed large amount of fluid discharge from the abdominal wound also on the 5th postoperative day and the patient was put on enteral feeding (jejunostomy) and parenteral nutrition but he died on the 30th postoperative day. The general condition of this patient was bad and he was debilitated and shocked on admission (systolic blood pressure < 90 mmHg).

Postoperative mortality happened in only one patient (2.9%).

Discussion

Previously, in developed countries, PUD perforations occurred predominantly in males and now the difference between males and females is decreasing. They give an explanation to this in the increased use of NSAIA by elderly females [17, 18]. There had been a consensus regarding the relationship between H.Pylori and uncomplicated PUD but on the contrary, the relationship between perforated PUD and H.Pylori had not been settled yet [17]. Some studies performed on patients with perforated PUD comparing them to other hospital controls regarding the serology of H.Pylori showed no difference between the two groups [17] while others showed that H.Pylori was much more common in the perforated PUD patients [18]. In the presented study, many risk factors like smoking and NSAIA had been studied but the presence of H.Pylori infection could not be studied because the serological and microbiological facilities to detect such infection are not available particularly at

night when the patient comes as an emergency case.

In one study most of the patients were of the low socioeconomic class [19] as also shown in the presented study.

The mean age of perforated PUD in this study was 50.4 years. One study from India reported most perforated duodenal ulcers to occur in the 3rd decade of life [20] while there is a shift toward elderly with high incidence of ulcerogenic drugs use in western countries [21]. In a study performed in Sweden, they state that the mean age for PUD rose from 59 to 67.9 years from the year 1974 to 2002 and they attribute this rise to the increased use of NSAIA in elderly females [22]. In the developing world, perforated PUD patients are usually young with male predominance as also shown in our study. Patients also present late and there is a strong association with smoking [22] as also shown in the presented study.

Our male: female ratio was 1.76:1 which is close to a study performed in Tanzania (1.3: 1) [16]. Previously, in developed countries, PUD perforations occurred predominantly in males and now the difference between males and females is decreasing. They give an explanation to this in the increased use of NSAIA by elderly females [23, 24]. In a study performed in Poland, they found that during the 2nd half of the 20th century, there was an increase in the proportion of females with perforated PUD and the male: female ratio changed from 7:1 to 2: 1[25].

12(35.2%) of the patients had previous history of taking NSAIA. This is comparable to other studies [16]. These drugs inhibit prostaglandin synthesis and so reduce gastric mucosal blood flow [26] and well-designed studies have clearly shown that NSAIA

and amino salicylic acid contribute to the development of PUD in a dose-dependent manner [27]. NSAIA increase the risk of perforation of PUD 5-8 times [28]. Increasing sales of NSAIA has been reported during the 1970s and 1980s to elderly females, a cohort that has also been reported to cause the increasing incidence of PUD complications [15]. On the contrary, a significant fall in PUD complications had been reported in a Swedish study after 1988 despite the increasing sales of NSAIA [24] and they attributed this difference to the small sample used in other studies [24] or to the declining prevalence of *H pylori* reducing the effect of increased NSAIA use [29] and it is well known that proton pump inhibitors protect against PUD complications in NSAIA users [30]. Despite the decreased PUD, the percentage of perforated PUD has been stable or increased and the explanation to this is the increased use of NSAIA [31].

17(50%) of the patients in our study were smokers. In the Tanzania study 64.3% were smokers [16]. In the developing world, the patient population is young with male predominance and there is a strong association with smoking [24]. Smoking inhibits pancreatic bicarbonate secretion resulting in increased acidity of the duodenal bulb. It also inhibits healing of PUD [32]. A prospective cohort study from Denmark found that smoking of more than 15 cigarettes per day increases PUD perforation 3-5 times [33]. The prevalence of smoking has declined during the last 20 years in Sweden, especially in males, which could perhaps justify the fewer PUD complications [34]. Most ulcer perforations in subjects

below 75 years can be attributed to smoking [4].

Only 8(23.5%) had a previous history of PUD. Some studies show similar results regarding previous history of PUD in those with complicated PUD [16] but other studies show different results (71% had previous history of PUD) [32]. It has been reported in many developing countries that the diagnosis of PUD is 1st made in many instances after perforation [35] and we also found this in our study. In other studies previous history of PUD has been found in 45% of the patients [36].

Air under the diaphragm had been found in the majority of the patients (91.2%). This number is higher than most other studies 75% [22]. This is due to the delayed presentation of patients who often go to other specialists (like internal medicine) before coming to the surgeon.

22(64.7%) of the patients presented late which is a high number and is attributed to three reasons:

1. Ignorance of the patient
2. Loss of the patient within the different specialties of medicine.
3. Wide range of investigations available nowadays.

Mortality occurred in 1(2.9%) patient due to postoperative leak and multi organ failure syndrome. This is low when compared to other studies which state that perforated PUD is a serious disease with a mortality rate of 5-25% rising to as high as 50% [36].

Conclusion

Perforated duodenal ulcer is a potentially-fatal disease that has to be dealt with abruptly once diagnosed. Care must be taken to prevent the complications especially in those who are elderly or have a comorbid illness as

these are the people at risk. Delay in the diagnosis usually happens in the peripheral hospitals and by medical specialties other than surgery.

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