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RESEARCH ARTICLE

LAPAROSCOPIC REPAIR OF PERFORATED PEPTIC ULCER VERSUS OPENREPAIR

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ABSTRACT

Perforated duodenal ulcer is one of the common surgical emergency and it is considered the most common cause of peritonitis. Inspite of antiulcer medication and Helicobacter eradication, Perforated peptic ulcer (PPU), is still the most common indication for emergency gastric surgery and is associated with high morbidity and mortality. Perforations of the peptic ulcers (PPUs) are the most common cause of emergency surgery among the complications of the gastroduodenal ulcers and the leading cause for morbidity and mortality due to secondary peritonitis and sepsis. PPU is a condition in which laparoscopic perforation repair (LPR) is an optimal solution. It makes possible the identification of the perforation's site and allows closure of the perforation and the subsequent peritoneal lavage, as in an open repair (OR) but without the large uppermid-abdominal incision. The outcome might be improved by performing this procedure laparoscopicallywithomental patch repair of perforated peptic ulcer carries lessmorbidity and mortality and early return of patients to their normal daily routine.

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INTRODUCTION

Duodenal ulcer perforations are considered one of the most a common causes of peritonitis. It was first described by Cellan-Jones in 1929 as The classic, pedicle of mental patch that is performed for the 'plugging' of these perforations (Kauffman, 2000), although it is commonly, and wrongfullly attributed to Graham, who described the use of a free graft of the omentum to repair the perforation in 1937 (Lickstein, 1997). In this, a strand of omentum is drawn over the perforation and held in place by placing full thickness sutures placed either sides of the perforation, and this procedure is the "gold standard" for the treatment of these perforations (Chaudhary, 1991 and Karanjia, 1993).

The treatment of perforated peptic ulcer may be

Non operative management: Conservative treatment is known as the Taylormethod and it involve nasogastric aspiration, intra venous antibiotics, and H.pylori triple therapy [5, 6]. It has been estimated that about 40-80% of the perforations will heal spontaneously (Bucher, 2007; Donovan, 1998; Zittel, 2000 and Crofts, 1989). However, delaying operative intervention beyond 12h after the onset of clinical picture may worsen the outcome in PPU (Zittel, 2000 and The Lancet, 1989). As well as in patients more than 70 years old conservative treatment is unsuccessful with a failure rate reaching 67% (The Lancet, 1989). The advantages of conservation are avoidance of operation with associated morbidity caused by surgery and anesthesia, and reduction in formation of intra-abdominal adhesion induced by surgery (Truscott, 1950). Disadvantages are the higher mortality rate in case conservative treatment fails and lack of the benefit of laparoscopy or laparotomy as a diagnostic tool in case the patient was misdiagnosed (Crofts, 1989 and Truscott, 1950).

Simple suture (Open repair technique): All surgical procedures start by giving prophylactic antibiotics at induction of anesthesia. In conventional surgery where upper midline incision is performed, identification of the site of perforation. In case of a gastric ulcer a biopsy is taken to exclude gastric cancer. Simple closure of the perforation can be done in different ways: simple closure of the perforation by interrupted sutures without omentoplasty or (free) omental patch, simple closure of the perforation with a pedicle of omentum sutured on top of the repair, representing omentoplasty, a pedicle of omental plug drawn into the perforation after which the sutures are tied over it and finally the free omental patch after Graham. The repair can be tested by either by filling the abdomen with warm saline and inflating some air into the nasogastric tube, if no bubbles appear, the perforation has been sealed appropriate, and also dye can be injected through the nasogastric tube (Schein, 2008).

Laparoscopy: Laparoscopic surgery offers several advantages. First of all a laparoscopic procedure serves as a minimal invasive diagnostic tool postoperative pain reduction, less consumption of analgesics ,reduction in hospital stay ,less wound infections, no burst abdomen and incisional hernia due to shorter scars and lower the incidence of postoperative ileus and chest infections (Ates, 2008 and Lau, 2005). The disadvantage of the laparoscopic approach are a prolonged operating time, higher incidence of re-operations due to leakage at the repair site and a higher incidence of intra-abdominal collection secondary to inadequate lavage (Ates, 2008; Lunevicius, 2005 and Lunevicius, 2005). The higher incidence of leakage might be caused by the difficulty of the laparoscopic suturing procedure. First of all this emphasizes the need for a dedicated laparoscopically trained surgeon to perform this procedure (Lau, 2002), some laparoscopic surgeons use omentopexy alone (Ates, 2008 and Lagoo, 2002). Laparoscopic repair of perforated peptic ulcer was introduced in 1989 by Mouret who used fibrin glue and omentalpatch (Karanjia, 1993). A year later, Nathanson et al. described the suture repair of perforated peptic ulcer (Bucher, 2007). Since then many efforts have been made to compare laparoscopic and open repair, laparoscopic repair is safe and effective procedure in selected patients, offering shorter operating time, less postoperative pain and shorter post-operative hospital stay (Bhogal, 2008 and Ates, 2007).

MATERIALS AND METHODS

This study was conducted in Aswan University Hospital on 60patients: In this prospective study we included first 60patientswho underwent laparoscopicand open repair of perforated duodenalulcer at our department. The patient classified blindly in to two groups, group Afor lap repair and contained 30 patients and group Bfor open repair and contained 30 patients. The patients were admittedin urgent setting. A detailed history was taken, all patient past history of gastritis or on medication of NSAID drugs. Thepatients were examined and showed surgical abdomen with board like rigidity. Main diagnostic procedure was chest X-ray in erect position (Figure 1). In15cases, additional abdominal ultrasound examination wascarried out because the patient coming with surgical abdomen and peritonitis but x ray no air under diaphragm. A standard work-up was performed, whichincluded complete blood count, random serum concentrations of glucose, urea, creatinine, protein, albumin andbilirubine. Before the start of the operation, patients receivedprophylactic antibiotic metronidazolandcefazolin. The patients received proton pump inhibitorpantoprazol (Controloc). Insertion of nasogastric tube and rehydration of patient with IVF started.

Inclusion criteria: The inclusion criteria were patients with suspected perforated duodenal ulcer based on clinical assessment, investigation.

Exclusion criteria: The exclusion criteria were patientsgastric outlet obstruction, bleeding ulcer.

Conversion criteria: Patients with perforation more than 10 mm, difficult identification of the perforation, cardiovascular instability, and iatrogenic injury that could not be managed laparoscopically were converted to laparotomy.

In group A for lap repair the operation started with a supraumbilicalincision, through which a Veress needle was inserted, and pneumoperitoneum of 14 mm Hg was achieved. A 10-mm port was inserted, which was used for laparoscope. Under visual control two additional ports were placed, a 5mmport one in Lt Hypochondrium and another in the RT. Exploration of the abdominal cavity was performed and the site of perforation was established (Figures 2,3). Washing of abdominal cavity with warm normal saline until the fluid became clear; it was then closed with interrupted re-absorbable sutures (polyglactin2/0 – Vicryl) including omental patch (Figure 4). Close the puncture wound with drain placed at the site of perforation (Figure 5) some times no need to put drain. After the operation the patients were transferred to the Department of Abdominal Surgery. A standardized postoperative treatment protocol was carried out.

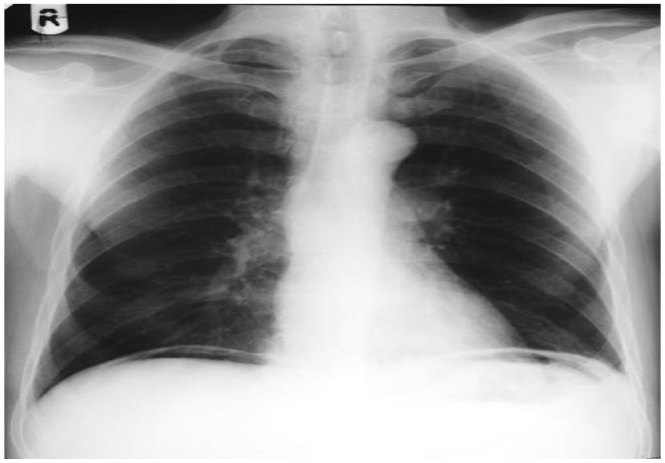

Figure 1. CXR showed air under diaphragm

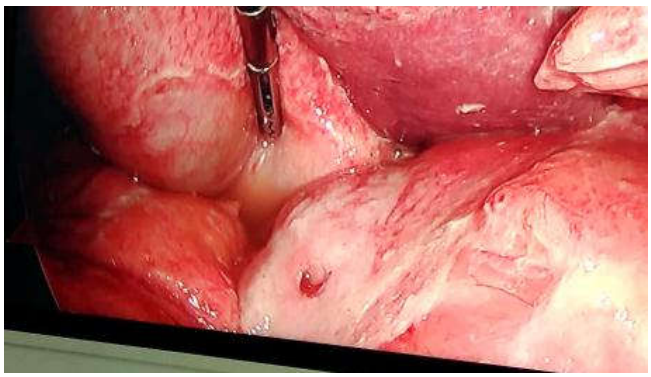

Figure 2. Perforation in the first part of duodenum

Figure 3. Perforation in the first part of duodenum

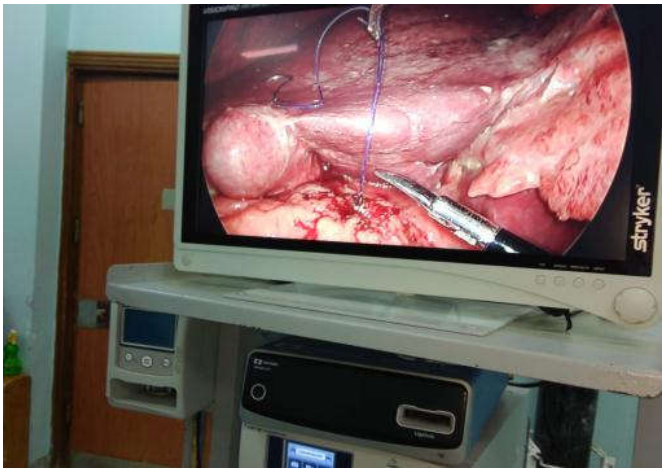

Figure 4. Lap repair of perforated DU with omental flap

Figure 5. Close of port sit and drain

In group B for open repairthe operation started with upper mid line incision. Exploration of the abdominal cavity was performed and the site of perforation was established. Washing of abdominal cavity with warm normal saline until the fluid became clear; it was then closed with interrupted re-absorbable sutures(polyglactin2/0 – Vicryl) including omental patch. Close of midline incision in layer with non-absorbable sutures. Thedrain placed at the site of perfortion. After the operation the patients were transferred to the Department of Abdominal Surgery. A standardized postoperative treatment protocol was carried out. Operative and Postoperative data will be recorded including: Operating time, Amount of postoperative analgesia, Duration of hospital stay, post-operative collection, Time needed for returning to work, Low grade fever, Vomiting and Wound infection. All the above data was collected and analyzed to obtain statistically relevant results.

RESULTS

Between AUG 2017 and AUG 2018, 60 patients presented withperforated peptic ulcer. We classified the patients into two different groups: GroupA for lap repair - and Group Bfor open repair.

Patient characteristics: In the group (group A for lap repair) there were 25male (83.3%) patients 5 female (16.6. %) (Figures 6,8). Mean age was 30 years (range 26–50) (Tabl-1)**.** The average BMI was 30 (range 20–52). The average ASA was 2.3 (range 1–4).

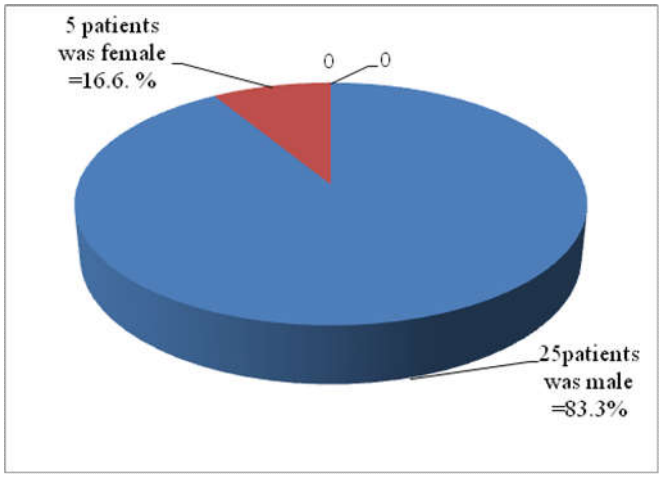

Figure 6. Male to female ratio in group A

In the (group B) there were 27malepatients (90%) and3 patient females (10%). Mean age was 35 years (range 27–55). The average BMI was 32 (range 21–71). The average ASA was 2.24 (range 1–4). Table(1), (Figures 7,8).

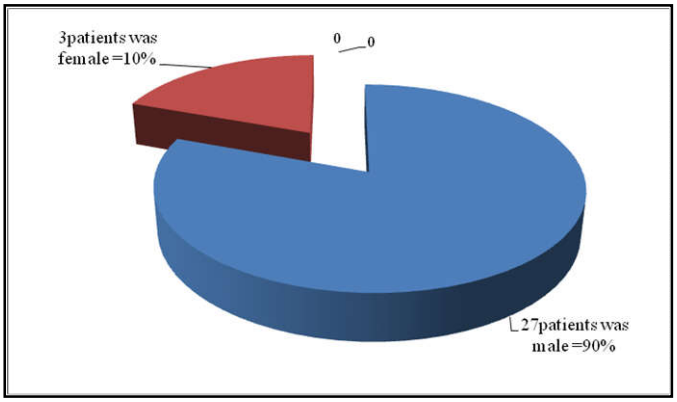

Figure 7. Male to female ratio in group B

Table 1. Patient characteristics

	Group A		Group B	
Number	30		30	
Male	25	83.3%	27	90%
Female	5	16.6%	3	10%
Mean Age	30		35	
BMI	30		35	
ASA	2.3		2.24	

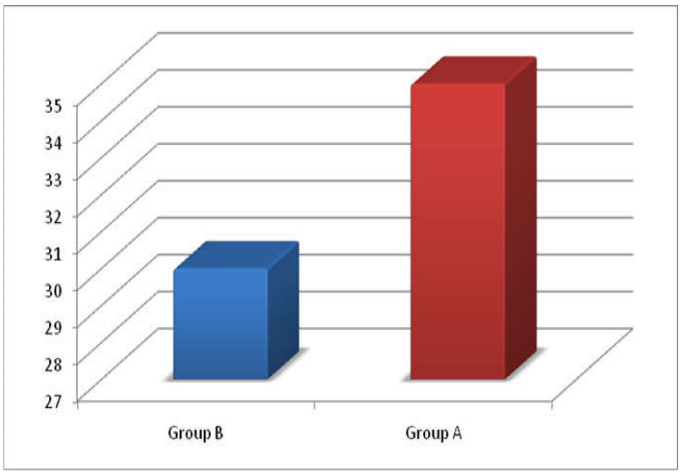

Figure 8. The mean age for both group A and B

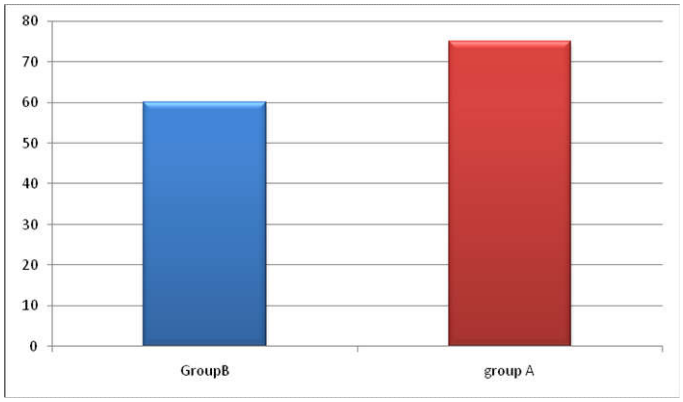

Figure 9. The mean operative time for both groups

Table 2. Operative and post-operative complications

Complication	Lap repair	Open
Bowel obstruction	-	3
Seroma	-	3
Reoperation	1	-
Ileus		3
Enterotomy	1	-
Respiratory distress	-	2
DVT	-	-
Wound infection	No	5

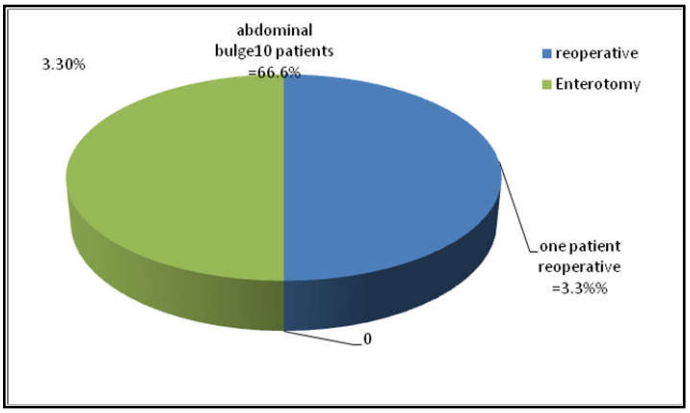

Figure 10. Post-operative complication for group A.

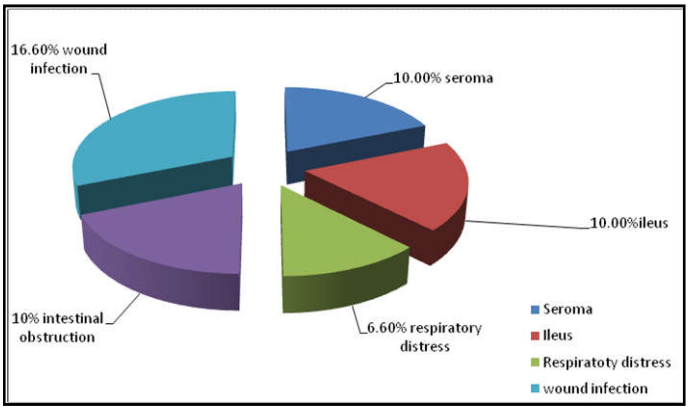

Figure 11. Postoperative complication for group B

Operative Time: Operative time was ranging between (65-110) minutes with a mean time 75 minutes for groupA. The operative times were longer for GroupA(lap repair) than group B (Foropen repair group the meanoperative time was 60 minutes) In the group A the first 10 cases is longer due to early learning (110minutes) but with more experience the operative time is decreased (Figure 9).

Operative Complications in group A: Accidental injury of small bowel had occurred in one patient(3.3%) by grasper, inspite of it the procedure was completed laparoscopically with repair of intestinal injury. One drain was left and removed after 5 days. No bowel obstruction, and no wound infection in this is group. Reoperation done in one patient (3.3%) due to leak for from repairand treated laparoscopic by another omental flap (Figure 10).

Operative Complications in group B: Ileus developedin 3 patients (10%) and treated with conservative treatment with IV fluids and NGT and improved later on 24 hours. Respiratoydistress had occurred in two obese patient (6.6%) and treated with head up, O2 mask and bronchodilators. Seroma developed inthree patients (10%) after 3days and treated withopen the wound and I v antibiotic. Wound infection happened in 5 patients (16.6%) and treated with daily dressing and antibioticbowel obstruction developed in 3 patients after one month, diagnosed as adhesive intestinal and treated with conservative treatment.

DISCUSSION

Laparoscopic repair of perforated peptic ulcer is a safe and reliable procedure. Laparoscopic treatment of perforated duodenal peptic ulcer is another example where laparoscopic approach is replacing traditional operation that has been widely used for decades. The laparoscopic approach reduces the access trauma, can confirm the diagnosis, and can be used to perform the same repair procedure and lavage as open omental patch repair. Lap repair of P U is minimally invasive surgery: low postoperative pain level, as indicated by low analgesic use, reduced chest complications, a shorter postoperative hospital stay, and earlier return to normal daily activities than the conventional open repair. As well as early ambulation and discharge (Lau, 2004). Laparoscopic surgery minimizes postoperative wound pain which lead to incisional hernia in some cases and encourages early mobilization and return to normal daily activities and good cosmetic appearance. The benefit of early discharge and early return to work may outweigh the consumable cost incurred in the execution of the laparoscopic procedures (Paterson-Brown, 1993). The patients in this study were earlier discharged from the hospital than the patients who had their perforated duodenal ulcer operated using open approach. Another good benefit of the laparoscopic procedure is cosmetic outcome. Nowadays patients are aware of this benefit, and sometimes this is the reason why they demand laparoscopic surgery (Svanes, 2000). The complication rate for laparoscopic repair was low and was associated with fewer chest infections and potentially less wound infection compared with open repair. The only disadvantage of the laparoscopic approach could be the little longer duration of operation (Paterson-Brown, 1993). We concluded her from our study to confirm that laparoscopic is gaining popularity for the treatment of perforated duodenal ulcer with omental patch. LPR showed similar or better results than OR in terms of morbidity, mortality, operation time and hospital stay. Sometimes no need to put drain provided good wash, suction and movement of patient up and down, RT and LT to confirm no collection in the abdominal space.

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