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Laparoscopic omental patch repair for perforated peptic ulcer: an early experience from Al-Sahel Teaching Hospital

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Abstract

Background

Peptic ulceration is a common condition. The most common etiologic factors are drugs use like NSAIDs and infection by *Helicobacter pylori*. The perforated duodenal ulceration is not an uncommon surgical emergency, our aim was to show our experience with Laparoscopic omental patch repair for perforated peptic ulcer.

Patient and Method

In this study, we included 16 patients who underwent laparoscopic repair of perforated duodenal ulcer at our department. The patients were urgently admitted to the emergency department.

Result

In our study, we have neither morbidity nor mortality. The recorded time for the operation was 72–90 min, and the median hospital stay was 6 days. Our study confirms the safety of laparoscopic approach in the treatment of perforated peptic duodenal ulcer.

Conclusion

Laparoscopic omental patch repair for perforated peptic ulcer is safe and practical.

Keywords: Laparoscopic repair, omental patch, peptic ulcer

INTRODUCTION

Peptic ulceration is a common condition. The most common etiologic factors are drugs use like NSAIDs and infection by *Helicobacter pylori*. The perforated duodenal ulceration is not an uncommon surgical emergency [1–3].

Although there has been a marked reduction in the number of elective surgeries for peptic ulcers, the occurrence of complications such as bleeding, obstruction, and perforation has remained the same [4,5]. A duodenal ulcer, which is perforated, is considered as an emergency in surgical wards.

The first laparoscopic suture repair that was successful for perforated peptic ulcer was portrayed by Nathanson *et al.* in 1990.[6,7] Moreover, Mouret *et al.* in 1990 revealed the first sutureless laparoscopic technique utilizing the

fibrin glue omental patch for repairing a duodenal ulcer perforation.[8]

The emerging laparoscopic technique has become a standard procedure. Duodenal perforation repair laparoscopically is a useful method for decreasing hospital stay, surgical complications, and rapid return to regular daily activities. Laparoscopic management can be done in almost all cases of a perforated ulcer. A median laparotomy, which can be complicated by wound infection and late incisional hernia,

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is now possible to be avoided by doing the laparoscopic technique.

The time of surgery, with continuous training in minimally invasive surgery, is shorter [7]. The safety of laparoscopic procedure for the treatment of perforated peptic ulcer is the same as the open approach [9]. This study shows our early experience in Al-Sahel Teaching Hospital from January 2015 to January 2017 in the laparoscopic closure of the perforated peptic ulcer.

PATIENTS AND METHODS

In this study, we included 16 patients who underwent laparoscopic repair of perforated duodenal ulcer at our department. The patients were urgently admitted to the emergency department. A full history was taken, and full clinical examination was done. In each case, we recorded the exact moment in which the symptoms appeared was established. We recorded the time from the onset of symptoms to the beginning of the operation. Abdominal radiography in an erect position was the primary diagnostic procedure that we performed; abdominal ultrasonography examination was done. A standard work-up including complete blood count and serum concentrations of glucose, urea, creatinine, protein, albumin, and bilirubin was done.

Before starting the operation, patients were given prophylactic antibiotic therapy consisting of metronidazole and third-generation cephalosporin. The operation began with a supraumbilical incision, through which a Veress needle was inserted, and pneumoperitoneum of 13 mmHg was achieved. A 10-mm port was entered, which was used for the laparoscope.

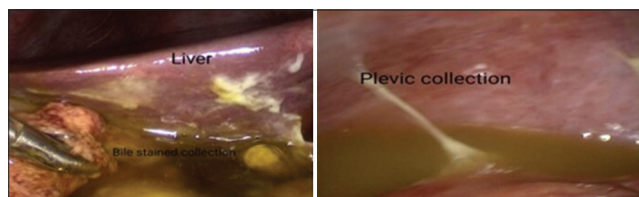


Figure 1: Exploration of the abdomen revealed bile stained collection.



Figure 3: Suction irrigation of the abdomen.

Under visual control, two additional ports were placed, a 10-mm port approximately at the level of the umbilicus, in the left midclavicular line and a 5-mm port in the right midclavicular line below the costal margin. The abdomen exploration was done to identify the site and size of perforation and assess the peritonitis (Fig. 1).

The exposed area, after retraction of the liver, is carefully checked. The perforation is usually identified explicitly in the anterior aspect of the first portion of the duodenum as a small hole (Fig. 2).

After that, cleaning of the abdomen was done. The irrigation with a warm saline solution must be aspirated. The abdomen is cleaned as follow, beginning at the right upper quadrant, heading off to the left, moving down to the left lower quadrant, and afterward at last to the right (Fig. 3).

The operating table tilting was adapted if needed. The pouch of rectovesical (uterine in females) and the loops of intestine should be paid special attention. Fibrous membranes, which might contain bacteria, are removed as much as we possible. When the abdominal cavity is appropriately cleaned, the focus is again on the perforation. Interrupted resorbable (polyglactin – vicryl) sutures

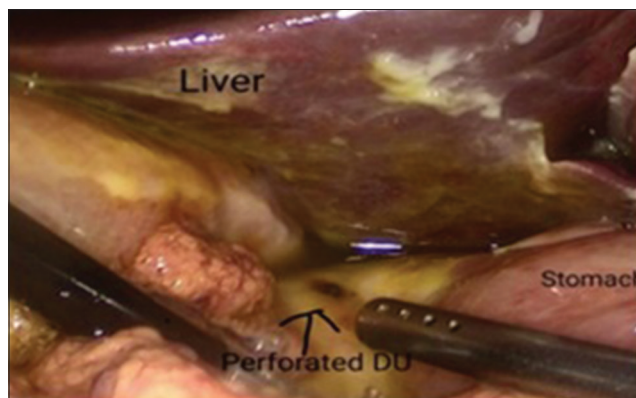


Figure 2: Perforation identification.

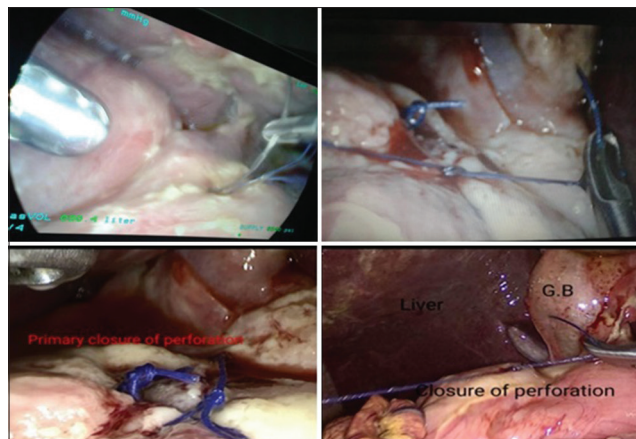


Figure 4: Closure of the perforation.



Figure 5: Omental patch.

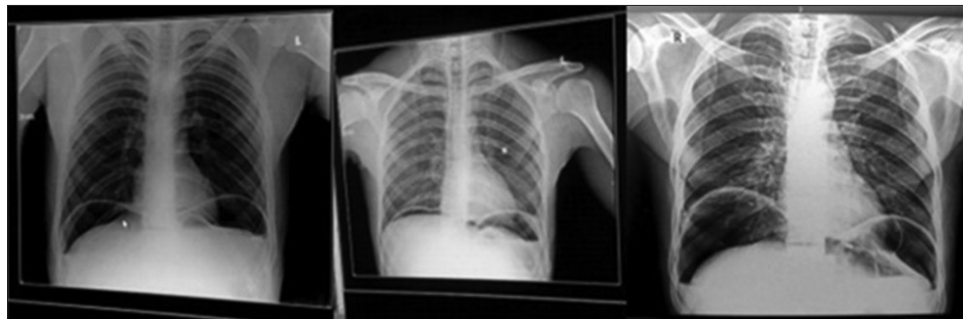


Figure 6: Plain chest radiographs showing air under diaphragm.

were used in the closure, using the intracorporeal tying technique (Fig. 4).

A part of the omentum was then positioned over the site of perforation and fixed with a single resorbable suture that was placed away from the site of perforation (Fig. 5).

The peritoneal irrigation was continued after placing the suture until the clear liquid is returned. We used about 4–6 l of warm saline. In some situations, 10 l was necessary for cleaning the field. Silicone drains (size vary from 12 to 18 Fr) of the peritoneal cavity are performed.

One or two drains are placed depending on the amplitude of abdominal peritonitis: the first drain was placed in the subhepatic region through the site of trocar situated on the right flank, and the second one was put at the rectovesical pouch level through the site of trocar located on the left flank.

By the end of laparoscopy, careful examination of the abdomen was done for searching of any injury to the bowel or any source of bleeding. We removed trocars one by one after ensuring hemostasis of the trocar sites. The telescope is removed. The gas valve of the umbilical port was left open to let all the gas out. The musculoaponeurotic plane is sutured only with the 10-mm trocar sites. The skin is closed. The duration of each operation was recorded.

Postoperatively, the patients received proton pump inhibitor intravenously while in the hospital and orally after the discharge. Nasogastric suction and prophylactic antibiotic therapy were discontinued 48 h postoperatively,

and enteral nutrition was commenced on the third postoperative day.

A year after the operation, we asked them to evaluate the appearance of their scars, and their overall satisfaction with the treatment by using marks from 1 to 5 (5 being the best mark). They were also asked if they had any postoperative symptoms related to the operation or similar to symptoms that preceded the operation.

RESULTS

Between January 2015 and January 2017, 16 patients underwent laparoscopic repair of the perforated peptic duodenal ulcer. All of them were males, and the mean age was 41 years (range: 23–62 years). Most of the patients were not known to have peptic ulcer disease before presentation, and only one case was known to have a peptic ulcer. Most of the patients had elevated white blood count, with a mean value of $13.15 \times 10^9/l$ (range: $5-25.6 \times 10^9/l$); other laboratory test results were not significant. Mean time from the onset of symptoms to the beginning of the operation was 7 h (range: 3–16 h). In 14 cases, the surgery was indicated by pneumoperitoneum that was evident in the abdominal radiography taken in erect position (Fig. 6).

In two cases, erect abdominal radiography was negative for pneumoperitoneum, so the operation was started as exploratory laparoscopy for acute abdomen. The diagnosis of perforated duodenal ulcer was established intraoperatively. In all cases, the site of perforation was closed using interrupted stitches.

Mean duration of the operation was 80 min (range: 60–130 min). The abdominal drain was removed after 3 days (10 cases) or 4 days (six cases). The early postoperative period was in all cases uneventful. Mean postoperative hospital stay was 5 days (range: 4–7 days). Control gastroscopy was performed 2 months postoperatively and revealed complete healing of the ulcer. On follow-up, the patients have graded the appearance of postoperative scars and their satisfaction with the procedure with the highest mark.

DISCUSSION

Revolutionary steps in the nonsurgical management of peptic ulceration and eradication of *H. pylori* resulted in a marked decrease in peptic ulcer occurrence and a major reduction in the number of elective performed surgeries. The number of patients with complications such as perforations, requiring surgical intervention is still relatively the same [1,10,11].

Minimally invasive surgery, after beginning laparoscopic cholecystectomy, has gained a highly expanding role in gastrointestinal surgery. In the past few years, the performance of laparoscopic surgery in managing perforated peptic ulcer has turned out to be well-liked by surgeons [12,13].

In 2004, Lau stated that the procedure of choice should be the minimal access approach [14], following their meta-analysis of the results of 13 trials that compared management outcomes for an open and laparoscopic repairs [15].

Lunevicius and Morkevicius [16] analyzed 25 studies and came up with that the most commonly used techniques were suture repair alone, suture repair with omentopexy, or omentopexy only.

The rate of overall morbidity was 6–10.5%, the postoperative mortality was from 0 to 3%, and the rate of conversion was between 7 and 15%. We had no conversions to open procedure and no complications in the early postoperative period.

In our study, we have neither morbidity nor mortality. The recorded time for the operation was 72–90 min, and the median hospital stay was 6 days. Our study confirms the safety of laparoscopic approach in the treatment of perforated peptic duodenal ulcer.

A recent meta-analysis done by Lau [15], who compared laparoscopic repair procedure and open repair procedure, showed that laparoscopy resulted in lower analgesic use postoperatively, lower rate of wound infection and rate of mortality, better cosmetic outcome, fewer incidence of incisional hernias but longer operating time and higher reoperation rates, which is in contrary to ours.

In our study, two patients had no air under diaphragm despite a high index of clinical suspicion, and laparoscopy confirmed the clinical suspicion; this reinforces the benefit of laparoscopy as a diagnostic procedure [17].

Although this cannot be verified statistically because of a small number of cases, the patients in this study were earlier discharged from the hospital than the patients who had their perforated duodenal ulcer operated using an open approach.

The only discouraging result of the laparoscopic approach could be the slightly longer duration of the operation. On the basis of these early results, we continue our efforts to perform laparoscopic treatment of perforated duodenal ulcer whenever feasible.

Our patients required significantly less parenteral analgesics with a lower visual analog pain scores on days 1 and 3 postoperatively. This can be explained by the fact that laparoscopic correction causes less pain postoperatively [1,18].

Duodenal perforation repair laparoscopically is a beneficial procedure for decreasing hospital stay, the rate of complications, and return to regular activity if done correctly. With continuous training and better ergonomics in minimally invasive surgeries, the time has arrived for placing it in the surgeon's practice.

Patients in our study who underwent laparoscopy in comparison with an open approach had less postoperative pain. The cosmetic results are a benefit of the laparoscopic procedure, which has not often been presented sufficiently in the literature [15]. Nowadays, this benefit is awarded, and sometimes is the reason that drives patients to demand laparoscopic intervention by name [17,19].

CONCLUSION

Laparoscopic management of perforated peptic ulcer is safe and practicable for the well-trained surgeon. It causes less pain postoperatively, and the rate of complications is less than an open approach.

These results, however, need further evaluation on a bigger sample of patients in the future studies.

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Conflicts of interest

There are no conflicts of interest.

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