

# LAPAROSCOPIC VERSUS OPEN APPROACH FOR REPAIR OF PERFORATED PEPTIC ULCER: A PROSPECTIVE STUDY

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## Introduction

PUD is prevalent, with a lifetime prevalence of 5-10% and an annual incidence of 0.1-0.3%. The yearly incidence of perforation varies from 0.004 to 0.014%. It remains the second most common cause of gastrointestinal perforation, necessitating urgent surgery, and the leading cause for gastric emergency surgery. The risk factors for PPU include NSAIDs, H. pylori, physiological stress, smoking, corticosteroids, and a history of PUD. The decrease in complications related to peptic ulcer disease may be linked to the global prevalence of antisecretory medications and a more judicious application of NSAIDs compared to previous practices. Peptic ulcer perforation usually manifests with an abrupt onset of severe pain in the epigastrium. Depending on the age of the patient and comorbid factors, fatalities can be as high as 20%.PPU is predominantly surgical, with various suture techniques outlined for the closure of the perforation. Laparoscopic omental patch repair (LOPR) for PPU was accomplished thirty years ago. early prospective studies effectively established the safety and feasibility of laparoscopic repair.

## Aim of the work

The aim of the present work is to compare the perioperative course after laparoscopic and open repair of perforated peptic ulcer (PPU) to assess the feasibility, effectiveness and complications of laparoscopic repair in Alexandria Main University Hospital.

## Patients and Methods

In this prospective randomized controlled study divided in to two equal groups at the emergency department (ER) at Alexandria Main University Hospital between July 2022 and July 2024, were included. Excluded from the study were patients presenting more than 48 hours from the onset of complaint, in septic shock, with associated gastric outlet obstruction, with previous open upper abdominal surgery, with severe cardiovascular disease, patients receiving chemotherapy &/or radiotherapy and pre-illness poor performance status. Data collection was done using a standardized data collection form to identify the difference between both techniques.

## Results

The study included a total of 40 patients. Group (1): 20 patients who underwent the conventional open technique. Group (2): 20 patients who underwent laparoscopic technique. According to established postoperative care standards in our hospital, all patients received standardized perioperative pain management.

The results indicate no statistically significant differences in these parameters of postoperative chest infection, deep vein thrombosis, persistant septic shock, postoperative intra-abdominal collection in absence of leak, need for reoperation, post-operative leak, delayed post-operative fistula and mortality rate between Group I and Group II. The results indicate a statistically significant difference in pain score in the first 48 hours, post-operative narcotic analgesic requirement, wound infection and hospital stay between the two groups, as in the laparoscopic group, the pain score in the first 48 hours of the post-operative period was statistically significantly lower than the open group on the visual analogue scale (p=<0.05). Furthermore, narcotic requirements was statistically significantly lower in the laparoscopic group compared to open group (p=<0.05). On the other hand, the incidence of wound infection was statistically significantly higher in the open group (p=<0.05). Similarly, the hospital stay was statistically significantly higher in the open group as compared to laparoscopic group (p=<0.05).

Table (1): Comparison between the two studied groups as regards intra-operative findings, events and operative time in both study groups

|                               | Laparoscopic group (LG)<br>(n = 19) |       | Open group (OG)<br>(n = 21) |      | Test of Sig       | p                     |
|-------------------------------|-------------------------------------|-------|-----------------------------|------|-------------------|-----------------------|
|                               | No.                                 | %     | No.                         | %    |                   |                       |
| Site                          |                                     |       |                             |      | $\chi^2=13.727^*$ | <0.001*               |
| Gastric (Pre-pyloric)         | 19                                  | 100.0 | 10                          | 47.6 |                   |                       |
| Duodenal (First inch)         | 0                                   | 0.0   | 11                          | 52.4 |                   |                       |
| Size                          |                                     |       |                             |      | $\chi^2=0.568$    | <sup>FE</sup> p=0.664 |
| <1cm                          | 17                                  | 89.5  | 17                          | 81.0 |                   |                       |
| 1–3cm                         | 2                                   | 10.5  | 4                           | 19.0 |                   |                       |
| >3                            | 0                                   | 0.0   | 0                           | 0.0  |                   |                       |
| Intra-operative complications |                                     |       |                             |      |                   |                       |
| Splenic injury                | 0                                   | 0.0   | 1                           | 4.8  | $\chi^2=0.928$    | <sup>FE</sup> p=1.000 |
| Conversion to open            |                                     |       |                             |      |                   |                       |
| Yes                           | 0                                   | 0.0   | 1                           | 4.8  | $\chi^2=0.928$    | <sup>FE</sup> p=1.000 |
| No                            | 19                                  | 100.0 | 20                          | 95.2 |                   |                       |
| Operative time in hours       |                                     |       |                             |      |                   |                       |
| Range.                        | 2.50 – 4.0                          |       | 2.50 – 4.0                  |      | t=0.009           | 0.993                 |
| Mean ± SD.                    | 3.26 ± 0.45                         |       | 3.26 ± 0.44                 |      |                   |                       |
| Median (IQR)                  | 3.0 ( 3.0 – 3.50)                   |       | 3.0 ( 3.0 – 3.50)           |      |                   |                       |

Table (2): Comparison between the two studied groups as regards the post-operative course and complications.

|                                                              | Laparoscopic group (LG)<br>(n = 19) |      | Open group (OG)<br>(n = 21) |      | Test of Sig.           | p                      |
|--------------------------------------------------------------|-------------------------------------|------|-----------------------------|------|------------------------|------------------------|
|                                                              | No.                                 | %    | No.                         | %    |                        |                        |
| Pain score in the first 48 hours                             |                                     |      |                             |      |                        |                        |
| Range.                                                       | 3.0 – 6.0                           |      | 4.0 – 7.0                   |      | U=34.000*              | <0.001*                |
| Mean ± SD.                                                   | 4.05 ± 0.71                         |      | 5.76 ± 0.89                 |      |                        |                        |
| Median (IQR)                                                 | 4.0 (4.0 – 4.0)                     |      | 6.0 (5.0 – 6.0)             |      |                        |                        |
| Post-operative narcotic analgesic requirement                | 2                                   | 10.5 | 14                          | 66.7 | χ <sup>2</sup> =13.099 | <0.001*                |
| Chest infection                                              | 5                                   | 26.3 | 10                          | 47.6 | χ <sup>2</sup> =1.931  | 0.165                  |
| Wound infection                                              | 0                                   | 0.0  | 6                           | 28.6 | χ <sup>2</sup> =6.387* | <sup>FE</sup> p=0.021* |
| Deep vein thrombosis                                         | 0                                   | 0.0  | 1                           | 4.8  | χ <sup>2</sup> =0.928  | <sup>FE</sup> p=1.000  |
| Persistant septic shock                                      | 0                                   | 0.0  | 1                           | 4.8  | χ <sup>2</sup> =0.928  | <sup>FE</sup> p=1.000  |
| Post-operative intra-abdominal collection in absence of leak | 0                                   | 0.0  | 1                           | 4.8  | χ <sup>2</sup> =0.928  | <sup>FE</sup> p=1.000  |
| Hospital stay (days)                                         |                                     |      |                             |      |                        |                        |
| Range.                                                       | 4.0 – 7.0                           |      | 5.0 – 27.0                  |      | U=63.500*              | <0.001*                |
| Mean ± SD.                                                   | 5.37 ± 0.68                         |      | 7.76 ± 4.64                 |      |                        |                        |
| Median (IQR)                                                 | 5.0 (5.0 – 6.0)                     |      | 6.0 (6.0 – 7.0)             |      |                        |                        |
| Need for reoperation                                         | 0                                   | 0.0  | 2                           | 9.5  | χ <sup>2</sup> =1.905  | <sup>FE</sup> p=0.488  |
| Mortality rate                                               | 0                                   | 0.0  | 1                           | 4.8  | χ <sup>2</sup> =0.928  | <sup>FE</sup> p=1.000  |
| Post-operative leak                                          | 0                                   | 0.0  | 1                           | 4.8  | χ <sup>2</sup> =0.928  | <sup>FE</sup> p=1.000  |
| Delayed post-operative fistula                               | 0                                   | 0.0  | 1                           | 4.8  | χ <sup>2</sup> =0.928  | <sup>FE</sup> p=1.000  |

## Conclusion

Laparoscopic repair of perforated peptic ulcer in a safe and feasible approach for management of perforated peptic ulcer with some advantage over open approach regarding hospital stay, postoperative pain and wound complications.