

## A Comparative Study between Open and Laparoscopic Omental Patch Repair of Perforated Duodenal Ulcer

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### Abstract

**Background:** Perforation is a life-threatening complication of duodenal ulcer (DU), it requires immediate surgical intervention in most cases. Perforation occurs in 2-10% of cases of DU with a high risk of mortality, especially among the elderly. Simple closure of the perforation with an omental patch is a technically easy, reliable and preferable method. However, many authors consider laparoscopic repair of perforated duodenal ulcer be superior to conventional open repair in terms of reduced pain, shorter hospital stay, better cosmetics and wound healing.

**Aim of Study:** The present work aimed to elucidate the differences between open and laparoscopic repair of PDU, regarding operation time and postoperative outcome.

**Patients and Methods:** The present cohort observational study, with a sample size of 40 patients, compared open omental patch repair, and laparoscopic repair of PDU, regarding operative time and post-operative outcome.

**Results:** Statistical analysis of the collected data, using one way ANOVA test, elaborated a significantly reduced operative time in laparoscopy group versus open repair group. Moreover, Laparoscopy group showed less incidence of postoperative ileus, leakage and ICU admission, compared to open repair group. Open repair group showed less incidence of postoperative ARDS, laparoscopic repair elucidated a significantly less time taken for mobilization of the patients postoperatively, and reduced mean hospital stay, versus open group.

**Key Words:** Laparoscopic – Omental Patch – Duodenal Ulcer.

### Introduction

**DUODENAL** ulcer is defined as an insult to the mucosa of the upper digestive tract resulting in ulceration that extends beyond the mucosa into the submucosal layer. Most perforated ulcers are situated on the anterior surface of the duodenum. The patients tends to be elderly, chronically ill

patients, often 40-50% taking ulcerogenic medication such as non-steroidal anti-inflammatory drugs

[1].

Perforated duodenal ulcer (PDU) carries a mortality rate ranging from 1.3% to 20%. NSAIDs, Helicobacter pylori (H. pylori), physiological stress, smoking, corticosteroids and previous history of perforation are risks factors for PDU [2].

Symptoms of PDU include abdominal pain and upper abdominal discomfort, gastric juice and gas enters the peritoneal cavity leading to chemical peritonitis. Sudden onset of abdominal pain or acute deterioration of the ongoing abdominal pain is typical of PDU [3].

Chemical peritonitis occurs due to efflux of gastroduodenal contents and severe pain lead to tachycardia. The classic triad of sudden onset of abdominal pain, tachycardia and abdominal rigidity is the hall mark of PDU [4].

An urgent erect chest X-ray and serum amylase/lipase is basic essential test in a patient with acute upper abdominal pain. 75% percent of PDU have free air under diaphragm on erect chest X-ray [5].

Simple closure of the perforation with an omental patch is a technically easy, reliable and preferable method [6]. An omental patch is covered to secure the perforation closure and prevent leakage

[2].

Laparoscopic repair of perforated duodenal ulcer is suggested to be superior to conventional open repair in terms of reduced pain, shorter hospital stay, better cosmetics and wound healing, and lower incidence of incisional hernias [5].

Some authors adhere to strict selection of patients with perforated duodenal ulcer for laparos-

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copy and use it for low-risk patients. Others adhere to a "laparoscopy-first" policy in the treatment of perforated peptic ulcer [7].

### Patients and Methods

Patients employed in the study were recruited from Ain Shams University Hospitals, and Al-Sahel Teaching Hospital, Cairo, Egypt.

Archived data from male and female patients who came to the emergency department in the time period from January 2020 till December 2021, meeting the study criteria, was collected and employed in the study groups.

Male and female patients who attended to the emergency department in the past 6 months (from January 2022 to June 2022), meeting the study criteria, presenting with acute abdominal pain, erect chest X-ray showing air under diaphragm, with a prior history suggestive of perforated duodenal ulcer and scheduled upon the consultant decision for open or laparoscopic exploration and omental patch repair were employed in the study groups.

By using G power program for sample size calculation, setting power at 80%, alpha error at 5%, and after reviewing previous studies [8], and assuming medium effect size difference (0.5) in the mean hospital stay between patients with perforated duodenal ulcers underwent repair through laparoscopy and open laparotomy; based on that, a sample size of at least 40 patients with perforated duodenal ulcer undergoing repair (20 patients in each group) was sufficient to achieve the study objectives.

A prior written consent was taken from patients, after explaining the study purpose, methods, risks and benefits.

All patients included in the study were subjected to meticulous clinical assessment: Detailed medical and family history: For causes of duodenal ulcer such as NSAIDs use, smoking, corticosteroids use and malignancy. Full Clinical examination: For signs suggestive of PDU such as generalized tenderness, rebound tenderness and rigidity.

Preoperative investigation were done: Routine laboratory investigations (CBC, coagulation profile, liver functions, kidney functions, random blood sugar, amylase/lipase). Pelvi-abdominal ultrasound. Erect X-ray chest.

Patients meeting the study criteria were subjected to laparoscopy or laparotomy at the discretion of the consulting surgeon.

**Group A:** Open surgery group technique after the patient is placed in supine position on the operating table, the abdomen was prepared and draped in a standard fashion. An upper midline abdominal incision is made for entry into the peritoneal cavity. Suctioning of gastro-intestinal spillage and of any fibrinous exudates is performed quickly, and attention is directed to inspection of the duodenum and visualization of the perforation. The perforation was usually found on the anterior wall of the duodenum, in proximity to the duodenal bulb. If the perforation is not apparent, mobilization of the duodenum along with inspection of the stomach and jejunum was carried out next. Three or four suture full-thickness bites were placed ~0.5 cm away from the edges of the perforation from one margin to the other and are laid out on each side of the duodenum. A patch of omentum is brought without tension and positioned over the perforation, and the sutures were successively tied from the superior to the inferior aspect across the omental patch to anchor the omental graft in place [8].

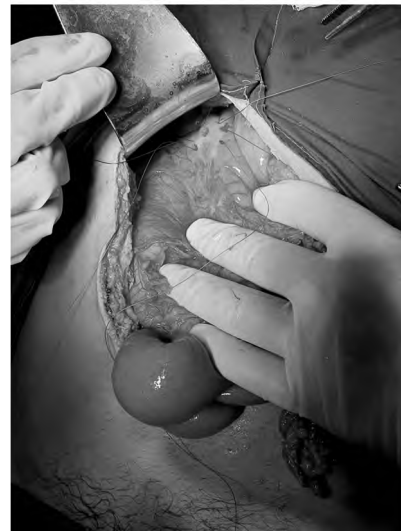


Fig. (1): Omental patch suturing of a perforated duodenal ulcer.

**Group B:** Laparoscopy group technique: The patients were operated in the Lloyd-Davies (French) position with anti-Trendelenberg position and the operating surgeon stood between the patient's legs. The peritoneal cavity is accessed either by veress needle or the Hasson technique. A 10 millimeter port was introduced through a supraumbilical incision.

A 30° camera was introduced through that port for primary abdominal exploration. If the diagnosis is confirmed, the other trocars are placed under laparoscopic guidance. Two 5mm working ports

were placed on the right and left midclavicular lines superior to the level of the umbilicus. The prepyloric and the duodenal regions are visualized to localize the perforation. After that, meticulous peritoneal irrigation and suction of all abdominal compartments was accomplished with extra attention to subphrenic, subhepatic, and pelvic regions along with obtaining samples for cultures. The perforation was repaired using intracorporeal 3/0 interrupted stitches that were tied over a pedicled omental patch. The number of stitches depended on the size of the perforation. Before ending the procedure, methylene blue test was used to rule out leak from the repair [8].

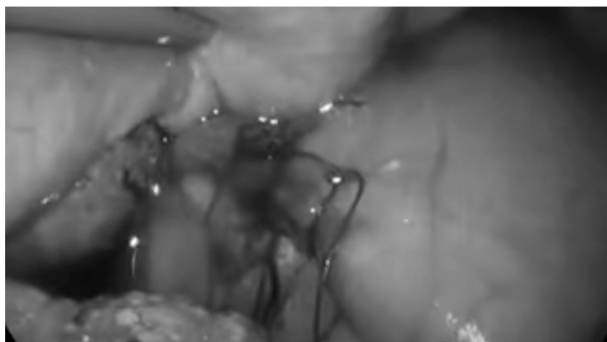


Fig. (2): Laparoscopic repair of PDU.

In the postoperative period, all the patients received intravenous fluids, broad-spectrum antibiotics, intravenous proton pump inhibitors (PPI), and analgesics, and underwent gastric decompression by a nasogastric tube for 1-2 days.

A liquid diet was prescribed to the patients on the second day after the operation, which gradually

progressed to a full diet with restoration of bowel movements. Upon being discharged, the patients received oral proton pump inhibitor (PPI) medication for 8 weeks. Pain and postoperative complications were monitored and recorded at certain follow up points: 3 days, 7 days and 14 days postoperative.

The two groups; open and laparoscopic omental patch closure of PDU, were compared regarding mean duration of the operation (in minutes), postoperative ileus, n (%), postoperative leakage, n (%), respiratory complications, n (%), mean time taken for mobilization of the patients (in hours), mean postoperative hospital stay (in days). The obtained data were recorded using Microsoft Excel worksheet, 2020. Statistical analysis was performed using statistical package for the social sciences (SPSS) version 21.0 (IBM Corporation, Somers, NY, USA) statistical software. The data were expressed as means  $\pm$  standard deviation (SD). Statistical evaluation was done using one-way analysis of variance (ANOVA). Significance was considered when p value was equal to or less than 0.05 throughout the study.

**Results**

The median age of the patients was 47 years old, and they ranged from a minimum value of 31 years old to maximum value of 55 years old.

Most patients of diagnosed perforated duodenal ulcer in the study mentioned a positive history of NSAIDS intake (20%), smoking (72%) and previous episodes of peptic ulcer disease (15%). Only 5% of the patients reported history of steroids intake (Fig. 1).

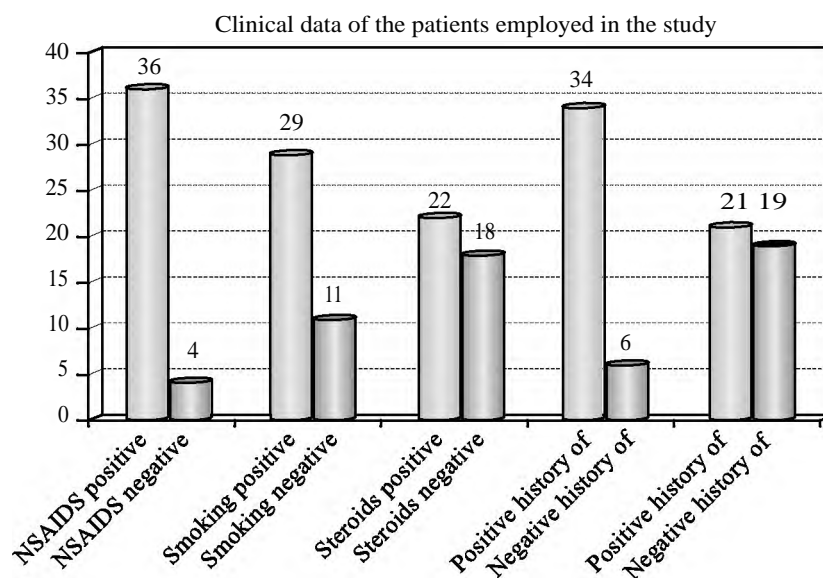


Fig. (1): A histogram showing clinical data of the patients employed in the study.

All the patients (100%) came to the emergency department with abdominal pain; 67.5% of them with localized epigastric pain, other clinical findings on the time of presentation were listed as in Table (1).

Table (1): Clinical features of the patients on the time of admission.

	All	Group A	Group B
<i>Abdominal pain:</i>			
Epigastric	27	16	11
Generalized	11	5	6
Other sites	2	2	0
Nausea and vomiting	23	15	8
Guarding	31	16	15
Fever	3	1	2
Tachycardia	28	11	17
Tenderness / Rebound tenderness	39	19	20
Erect chest X-ray showing air under diaphragm	33	15	18
Pelvi-abdominal U/S showing free fluid	35	16	19
TLC >11,000	32	12	20
ABG with lactate level >2	18	6	12

15% of the study population were complicated with postoperative ileus; 10% of them in the open group, and 5% in the laparoscopic group. Other complications were documented and tabulated for one way ANOVA test (Table 2).

Table (2): Comparison of the outcomes of open and laparoscopic repairs.

	All	Open	Laparoscopic	P-value
- Mean duration of the operation (minutes)	57.7±4	64.1±3.7	49.3±2.1	0.0001*
- Post-operative ileus	6	4	2	0.0001*
- Post-operative leakage	1	1	0	0.0001*
- Respiratory complications	3	2	1	0.0001*
- ICU Admission	4	3	1	0.0001*
- Mean time taken for mobilization of the patients (in hours)	5.9±1	7.3±1.2	3.5±0.6	0.0001*
- Mean post-operative hospital stay (in days)	5±1	6±1	4±1	0.0001*

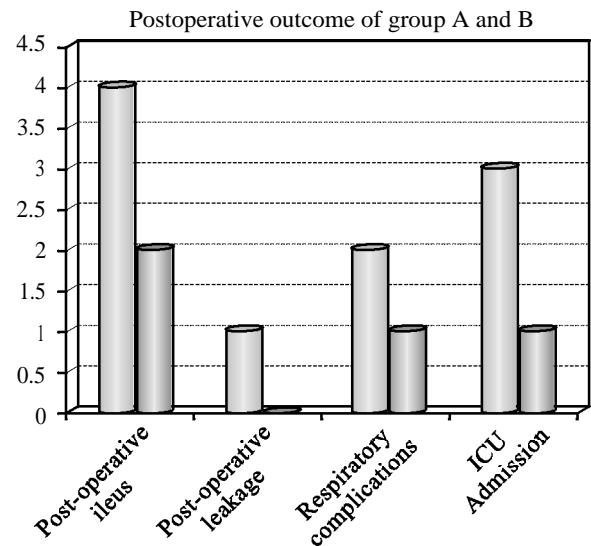


Fig. (2): A column chart showing postoperative outcome of groups A & B.

### Discussion

In our work, more males were affected (78% of the study population). This gender prevalence concurred with other reports in the previous literature [9,10]. Some authors advocated the high incidence of PUD among males to smoking and excessive alcohol consumption prevalent amongst this gender [11]. In the current work, These demographic features revealed no statistically significant differences across the two groups; patients were allocated in the study groups upon the surgeon decision.

In the present study, 20% of the patients diagnosed with perforated duodenal ulcer mentioned a positive history of NSAIDs intake. Some authors reported a strong evidence of association between NSAIDs intake and duodenal ulcer disease [12,13,14]. It was elucidated that NSAIDs act by inhibiting the COX-II enzyme and thus limiting its gastro-protective effect [15]. Studies have elaborated that the deleterious effect of NSAIDs on duodenal mucous membrane is aggravated by the synergism of NSAIDs intake, alcohol intake and smoking [9].

In the current work, 72% of the study population reported positive history of smoking. Previous workers reported a strong association between smoking and perforated DU [16,17,18]. Smoking is a proved risk factor for duodenal ulcer disease and its complications. Smoking leads to a decrease in pancreatic Na bicarbonate secretion leading to increased duodenal acidity and ulceration [19].

In the present work, 15% of the study population reported previous episodes of peptic ulcer disease.

While 5% of them mentioned previous infection with *H.pylori*. In agreement with that, previous workers reported similar results [20,21]. A previous study stated that eradication of *H.pylori* in cases of PDU after surgical management significantly decrease ulcer relapse in one year [22].

In accordance with our work, it was elucidated that abdominal pain is the main presentation of patients with perforated duodenal ulcer [8,23,24]. In the present study, 100% of the employed patients complained of abdominal pain; 67.5% epigastric pain, 27.5% generalized abdominal pain and 5% at other sites. Many authors reported that patients with duodenal ulcer perforation will typically complain of severe epigastric pain [25,26].

In the present study, 57.5% of the patients came with nausea and vomiting. Duodenal ulcer perforation is a 3 stage process; early period (lasts 4-6 hours) with acute localized abdominal pain, nausea, vomiting and tachycardia [19]. In our work, 12.5% of the patients showed evident tachycardia.

Intermediate period (up to 12 hours) with generalized abdominal pain. Late period (after 12 hour) pain, fever, sign of hypervolemia and distension of abdomen, patient becomes hemodynamically unstable. In the current work, 20% of the patients were feverish. Previous studies reported similar findings [27,28,29]. In the present study, total leucocytic count was above 11,000 in 15% of the patients and ABG lactate level was above 2 in 10% of the study population.

In the current work, physical data of the study population revealed 77.5% with abdominal muscles guarding and 97.5% with abdominal tenderness / rebound tenderness. Many authors advocated abdominal tenderness and guarding to chemical peritonitis; when the bowel contents leak freely into the abdominal cavity it causes diffuse peritonitis [23,26,28,30].

In the present study, 82.5% of the population showed air bubbles under the diaphragm in erect chest X-ray. Previous literature discussed the crucial role of erect chest X-ray in the diagnosis of gastroduodenal perforation [8,31,32]. The later stated that erect chest X-ray can be utilized as a preoperative procedure with total sensitivity of 86% for perforated stomach or duodenum.

In this retrospective and prospective cohort study, outcomes for open repair and laparoscopic repair for PDU were compared in several perspectives. Mean duration of the operation was found to be significantly less in laparoscopy group, com-

pared to open group. In agreement with our work, a study reported shorter operation time in laparoscopic repair than open repair [8]. In other studies duration of the operation was significantly longer in the laparoscopy group than in the open group [33,26]. Operative time is dependant on the hand skills of the authorized surgical team, which is variable from center to the other [8].

In the present work, 15% of the patients were complicated with postoperative ileus; 10% of them in the open group, and 5% in the laparoscopic group. Statistical analysis elaborated a highly significant difference in the incidence of postoperative ileus in laparoscopic versus open repair. Several studies elucidated similar results [3,34].

Statistical analysis of our work revealed that 12.5% of patients were complicated with postoperative leakage; 10% in the open group, and 2.5% in the laparoscopic group. Laparoscopic repair showed a significant decline in the mean value of incidence of postoperative leakage, compared to open repair. Other workers reported similar findings [4,6,33]. However, others found no significant difference between open and laparoscopic group in the incidence of postoperative leakage [26].

7.5% of the study population had postoperative respiratory complications; 2.5% of them in laparoscopic group, and 5% in the open group. Unlike postoperative ileus and leakage. Previous authors elaborated similar findings [23,26].

Although some authors, reported higher incidence of pneumonia and chest infections in open repair, compared to laparoscopic repair [8]. The influence of surgical positioning, as well as the pneumoperitoneum induced for laparoscopic surgery on respiratory mechanics, may predispose to lung atelectasis and ARDS, in laparoscopic repair [35].

In the current study, post operative kidney injury was detected only in 5% of the patients; 2.5% equally in each group, with no statistically significant difference between them. In disagreement with the present work, a study reported less incidence of kidney injury in laparoscopy group [23].

In our work, 10% of the patients were admitted to ICU post operative; 7.5% of them were in group A (open repair) and 2.5% were in group B (laparoscopic repair). Previous studies reported less ICU admission in laparoscopic repair of perforated DU, when compared to open repair [8,23,36].

Statistical analysis of the current work elaborated mean value of postoperative immobilization of the patients was  $7.3 \pm 1.2$  hours in the open repair group, and  $3.5 \pm 0.6$  in the laparoscopy group. In accordance to our work, several workers reported shorter time needed for mobilization of the patients in laparoscopy, compared to laparotomy [6,28].

In the present study, mean postoperative hospital stay was significantly shorter in laparoscopy group ( $5 \pm 1$  days), versus open group ( $12 \pm 1.9$  days). Many authors have all deduced that patients who received laparoscopic management of perforated duodenal ulcer showed shorter hospital stay, than those who had open repair [8,23,26].

### Conclusion:

The present study deduced that laparoscopic repair of perforated duodenal ulcer is preferable to open surgery, in terms of operation time, early mobilization and hospital length of stay. Through statistical analysis of the data available, laparoscopic repair caused less incidence of postoperative ileus, ICU admission and suture leakage, than open group. Regarding postoperative respiratory complications, laparotomy was found to cause less incidence of ARDS.

### References

- 1- KIM N.: Peptic ulcer disease. In Sex/Gender-Specific Medicine in the Gastrointestinal Diseases (pp. 131-151). Springer, Singapore, 2022.
- 2- DAVENPORT D.L., UELAND W.R., KUMAR S., PLY-MALE M., BERNARD A.C. and ROTH J.S.: A comparison of short-term outcomes between laparoscopic and open emergent repair of perforated peptic ulcers. *Surgical Endoscopy*, 33 (3): 764-772, 2019.
- 3- ZHU C., BADACH J., LIN A., MATHUR N., MCHUGH S., SARACCO B., ADAMS A., GAUGHAN J., ATABEK U., SPITZ F.R. and HONG Y.K.: Omental patch versus gastric resection for perforated gastric ulcer: Systematic review and meta-analysis for an unresolved debate. *The American Journal of Surgery*, May 1; 221 (5): 935-41, 2021.
- 4- SONAL K.: Conventional omental patch repair versus laproscopic closure of duodenal ulcer: A comparative study in north Indian teaching hospital. *International Journal of Surgery*, 5 (2): 21-24, 2021.
- 5- ABDELWAHED A. and MASHAL A.: Comparison study between the outcome of laparoscopic and open repair of perforated duodenal ulcer. *The Scientific Journal of Al-Azhar Medical Faculty, Girls*, 2 (3): 212, 2018.
- 6- MURAD M.F., KHAN R., TARIQ M., AKRAM A., MERRELL R.C. and ZAFAR A.: Laparoscopy: A Better Approach for Perforated Duodenal Ulcer. *Cureus*, 12 (10), 2020.
- 7- TARASENKO S.V., NATALSKY A.A., PANIN S.I., SAZHIN I.V., YUDIN V.A., SAZHIN V.P. and BOGO-MOLOV A.Y.: Modern aspects of the complex treatment of perforated gastric and duodenal ulcer. *Khirurgiia*, (1): 42-46, 2021.
- 8- STEPANYAN S.A., PETROSYAN A.A., SAFARYAN H.H., YEGHIAZARYAN H.H., ALEKSANYAN A.Y., HAKOBYAN V.M. and MKRTCHYAN M.H.: Laparoscopic and open repair for perforated duodenal ulcer: single-center experience. *Videosurgery and Other Minimally Invasive Techniques*, 14 (1): 60, 2019.
- 9- SVANES C.: Trends in perforated peptic ulcer: Incidence, etiology, treatment, and prognosis. *World Journal of Surgery*, 24 (3): 277-283, 2000.
- 10- SAMPATH E. and CHEETI A.V.: A Clinical Study of Duodenal Ulcer Perforation. *International Journal of Scientific Study*, Aug. 29; 8 (12): 208-11, 2021.
- 11- UGOCHUKWU A.I., AMU O.C., NZEGWU M.A. and DILIBE U.C.: Acute perforated peptic ulcer: On clinical experience in an urban tertiary hospital in south east Nigeria. *International Journal of Surgery*, 11 (3): 223-227, 2013.
- 12- PFEIFER J.M., LEVY N.A., CARTER D.L. and BEAL M.W.: Gastric or duodenal perforation and secondary septic peritonitis following therapeutic nonsteroidal anti-inflammatory drug administration. *Journal of Veterinary Emergency and Critical Care*, 2022.
- 13- HIJOS-MALLADA G., SOSTRES C. and GOMOLLÓN F.: NSAIDs, gastrointestinal toxicity and inflammatory bowel disease. *Gastroenterología y Hepatología (English Edition)*. Feb 10, 2022.
- 14- THIRUPATHAIAH K., JAYAPAL L., AMARANATHAN A., VIJAYAKUMAR C., GONEPPANAVAR M. and RAMAKRISHNAIAH V.P.N.: The Association Between Helicobacter Pylori and Perforated Gastroduodenal Ulcer. *Cureus*, 12 (3), 2020.
- 15- IWASAKI H., SHIMURA T., YAMADA T., NISHIGAKI R., OKUDA Y., FUKUSADA S., OZEKI T., KITAGAWA M., KATANO T., TANAKA M. and NISHIE H.: Novel and Simple Criteria for Predicting Mortality of Peptic Ulcer Disease. *Internal Medicine*, 6945-20, 2021.
- 16- BHASKAR M.: A clinical study of factors affecting the prognosis in duodenal ulcer perforation cases in tertiary care hospital, Kanchipuram district. *International Surgery Journal*, 6 (12): 4290-4293, 2019.
- 17- UNAR S.K., DANISH A.A., BHURT A.A. and LAGHARI A.A.: Outcome of duodenal ulcer perforation after graham omental patch repair. *Annals of Punjab Medical College*, 13 (1): 14-17, 2019.
- 18- TAG EL-DIN M.: Laparoscopy Versus Laparotomy in The Surgical Treatment of Perforated Duodenal Ulcers. *The Egyptian Journal of Hospital Medicine*, 81 (6): 2173-2178, 2020.
- 19- CHUNG K.T. and SHELAT V.G.: Perforated peptic ulcer-an update. *World Journal of Gastrointestinal Surgery*, 9 (1): 1, 2017.
- 20- MOHAPATRA S.K. and GANAPATHI R.: Duodenal ulcer perforation in the rural population of Andhra Pradesh: A tertiary care hospital based study. *International Journal of Surgery*, 3 (3): 288-290, 2019.
- 21- CLINCH D., DAMASKOS D., DI MARZO F. and DI SAVERIO S.: Duodenal ulcer perforation: A systematic

- literature review and narrative description of surgical techniques used to treat large duodenal defects. *Journal of Trauma and Acute Care Surgery*, Oct 1; 91 (4): 748-58, 2021.
- 22- DOLICH M.: Perforated Peptic Ulcer. In 50 Landmark Papers (pp. 2-3). CRC Press, 2019.
- 23- JAMAL M.H., KARAM A., ALSHARQAWI N., BUHAMRA A., ALBADER I., AL-ABBAD J. and ALSABAH S.: Laparoscopy in acute care surgery: Repair of perforated duodenal ulcer. *Medical Principles and Practice*, 28 (5): 442-448, 2019.
- 24- MASOOD A., VIQAR S., ZIA N. and USMAN GHANI M.: Early Oral Feeding Compared With Traditional Post-operative Care in Patients Undergoing Emergency Abdominal Surgery for Perforated Duodenal Ulcer. *Cureus*, 13 (1), 2021.
- 25- STERN E., SUGUMAR K. and JOURNEY J.D.: Peptic ulcer perforated. In Stat Pearls [Internet] Jun 23. Stat Pearls Publishing, 2021.
- 26- ABDUL LATIF A.B., MAHMOUD M. and AL-MEZAIEN O.: Laparoscopic repair of perforated duodenal ulcer: A comparison with the open surgical technique. *Al-Azhar International Medical Journal*, 2022.
- 27- NARAYANAN M., REDDY K.M. and MARSICANO E.: Peptic ulcer disease and Helicobacter pylori infection. *Missouri Medicine*, 115 (3): 219, 2018.
- 28- MOHSINA S., MUTHUSAMI A., SHANKAR G., SURESHKUMAR S. and KATE V.: Helicobacter pylori eradication in complicated peptic ulcer: Beneficial in most?. *International Journal of Advanced Medical and Health Research*, 3 (2): 58, 2016.
- 29- GAVIT S.M. and AHIRRAO B.M.: A Study of Risk Factors, Early Evaluation and Management of Duodenal Ulcer Perforation Peritonitis. *Galore International Journal of Health Sciences and Research*, 5 (1): 66-76, 2020.
- 30- LANAS A. and CHAN F.K.: Peptic ulcer disease. *The Lancet*, 390 (10094): 613-624, 2017.
- 31- ALARADI H.: Presentation and Management of Perforated Duodenal Ulcer. *Bahrain Medical Bulletin*, 40 (4), 2018.
- 32- NOURI D., GJ N.S., ATAEI F. and MOHAMMADI M.: Effects of sex, age, size and location of perforation on the sensitivity of erect chest X-ray for gastroduodenal perforation. *Radiography*, 27 (4): 1158-1161, 2021.
- 33- ALNAIMY T.A., ELALFY T.R. and ELKILANY M.A.: A Comparison of Laparoscopic and Open Repair of Perforated Duodenal Ulcer Using Omental Patch: A Prospective Randomized Controlled Trial. *Kasr El Aini Journal of Surgery*, 19 (1): 1, 2018.
- 34- SIOW S.L., MAHENDRAN H.A., WONG C.M., HARDIN M. and LUK T.L.: Laparoscopic versus open repair of perforated peptic ulcer: Improving outcomes utilizing a standardized technique. *Asian Journal of Surgery*, 41 (2): 136-142, 2018.
- 35- LEHAVI A., LIVSHITS B. and KATZ Y.: Effect of position and pneumoperitoneum on respiratory mechanics and transpulmonary pressure during laparoscopic surgery. *Laparosc. Surg.*, 2: 60-60, 2018.
- 36- MIRABELLA A., FIORENTINI T., TUTINO R., FALCO N., FONTANA T., DE MARCO P. and COCORULLO G.: Laparoscopy is an available alternative to open surgery in the treatment of perforated peptic ulcers: A retrospective multicenter study. *BMC Surgery*, 18 (1): 1-6, 2018.

## دراسة مقارنة بين إصلاح قرحة الإثني عشر المتقوية برفعة ثربية بالجراحة المفتوحة وبمنظار البطن

إن إصلاح قرحة الإثني عشر المتقوية باستخدام المنظار هو خيار جراحى آمن ومجدى. لقد ثبت أنه أفضل من الإصلاح المفتوح من حيث حدوث التسريب والإنداد المعوى الوظيفى بعد العملية الجراحية.

أوضحت الدراسة الحالية أيضاً أن الإصلاح بالمنظار هو الأمثل لتقصير الوقت اللازم للإقامة فى المستشفى بعد الجراحة.

أما بالنسبة لوقت العملية، فكونها تعتمد على مهارات وخبرات الفريق الجراحى، فقد كانت أقصر فى مجموعة تنظيف البطن.

على الرغم من أن الجراحة بالمنظار قد أبلغت عن المزيد من حالات متلازمة الضائقة التنفسية الحادة بعد الجراحة فى دراسات سابقة، إلا أن المضاعفات التنفسية كانت نسبة حدوثها أكثر فى الجراحة المفتوحة فى هذه الدراسة.

حاجة المرضى لدخول وحدة العناية المركزة بعد الجراحة كانت أعلى فى مجموعة الإصلاح المفتوح أكثر من الجراحة بالمنظار، أما فيما يخص الوقت اللازم لتحرك المريض بعد الجراحة فقد استلزم المرضى وقت أطول بعد الإصلاح المفتوح عنه فى الإصلاح بالمنظار.