

## EVALUATION OF HERNIORRHAPHY FOR PARA - UMBILICAL HERNIA ASSOCIATED WITH LAPAROSCOPIC CHOLECYSTECTOMY

By

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### ABSTRACT

**Background:** Para-umbilical hernia repair (PUHR) combined with LC result in longer operating time, longer anesthesia, and risk of increased blood loss. But it has the advantages of single hospital stay, single anesthesia exposure, less post-operative pain and morbidity, early return to work, better cosmesis and more convenient , efficacy and cost effective for the patient.

**Objective:** To evaluate the selected repair methods for para-umbilical hernias that already exist or are encountered incidentally and to present data regarding potential problems that may occur during laparoscopic cholecystectomy.

**Patients and Methods:** During period of January 2017 to January 2019, laparoscopic cholecystectomy was attempted in 25 patients suffering from chronic calcular cholecystitis accompanied by para-umbilical hernia, patients were assigned to two groups according to occurrence of recurrence. A retrospective analysis of parameters, including patient demographics, laboratory values, radiologic data, and intraoperative findings, was performed.

**Results:** The operating time, postoperative pain, length of hospital stay, wound infection and the time needed for return to work were less in patients without recurrence than patients with recurrence. Recurrence occurred in cases with BMI  $35.5 \pm 8.08$ , patient with comorbidities (DM and hypertension) and size of the defect  $2.4 \pm 0.07$  cm. Cases with recurrence have longer operational time and hospital stay than cases without recurrence and take more days to return to work. Cases with recurrence have also other complication such as hematoma and wound infection. There was a moderate positive correlation between BMI and both operating time and length of hospital stay. There was strong positive correlation between size of hernia and both operating time and length of hospital stay. There was a strong positive correlation between comorbidity and both operating time and length of hospital stay.

**Conclusion:** Para-umbilical hernia repair combined with laparoscopic cholecystectomy resulted in longer operating time, longer anesthesia, and risk of increased blood loss. But it has the advantages of single hospital stay, single anesthesia exposure, less postoperative pain and morbidity, early return to work, better cosmesis and more convenient, efficacy and cost effective for the patient. However, the outcomes of the para-umbilical defect repair with mesh after laparoscopic surgeries appeared to be better for either obese or non-obese patients than primary suture techniques in recurrence rates.

**Keyword:** Hernia repair, Laparoscopic cholecystectomy, Para-umbilical hernia.

## INTRODUCTION

Laparoscopic surgery has passed through different stages of evolution to reach its present status where it has earned the title of “Gold Standard” treatment for various surgical problems. The initial period of the learning curve has now been shortened substantially, and most centers are imparting training to budding surgeons all over the world (*Malik, 2011*).

Para-umbilical hernia (PUH) is mainly due to a defect in the line a alba. Hernia sac usually consists of fat tissues of peritoneal cavity, small intestine and omentum (*Martis et al., 2011*).

Paraumbilical hernias are more common in female than male. Factors related with occurrence and recurrence of PUH are obesity, age and multiparit .Treatment of choice is elective surgery due to chances of incarceration, obstruction and strangulation. (*Farquharson et al., 2014, Kulaçoğlu, 2015 and Lanaya et al., 2018*).

Previously tension free suture was used which was replaced by the usage of mesh to repair the hernia, which may reduce the rate of recurrence. Umbilical hernias (UH) comprise 6% of abdominal wall hernias in adults and it frequently accompanies cholelithiasis especially in female patients (*Aslani and Brown, 2010*).

With advancement in laparoscopic surgery a number of surgical procedures can be performed combined with laparoscopic cholecystectomy in a single surgery. Combined procedures provide patients with all the benefits of minimal invasive surgery and also give the benefit of single time anesthesia without adding

to post-operative and hospital stay (*Savita et al., 2010*).

Each of the procedure performed laparoscopic ally benefits from decreased postoperative pain, early ambulation, and early return to oral feeds, early discharge and early return to work. Patient benefits from the single exposure to anesthesia, single hospital stay, and single break from work. The procedures when combined have proved equally safe and efficacious as when done singularly (*Savita et al., 2010*).

**The aim of the present study was to** evaluate the selected repair methods for para-umbilical hernias that already exist or are encountered incidentally and to present data regarding potential problems that may occur during laparoscopic cholecystectomy.

## PATIENTS AND METHODS

A retrospective study during the period from January 2017 to January 2019 and included twenty-five patients at Al-Azhar University hospitals with chronic calcular cholecystitis accompanied by Para-umbilical hernia who underwent laparoscopic cholecystectomy and para-umbilical hernia repair simultaneously.

All patients had been consented for laparoscopic cholecystectomy with para-umbilical hernia repair. Patients with para-umbilical hernia were diagnosed by clinical examination in the preoperative period. Ultrasonography was performed in all patients with para-umbilical defect detected during physical examination or in those with possible hernia in order to characterize defect size and content of

para-umbilical hernia and chronic calcular cholecystitis.

**Inclusion criteria:**

Any age, any sex of patients with non-complicated chronic calcular cholecystitis associated with para-umbilical hernia with defect size less than 3 cm.

**Exclusion criteria:**

Patients with associated diseases such as chronic pulmonary disease, cardiac disease, ascites, chronic renal failure, patients with strangulated para-umbilical hernia, patients with recurrent para-umbilical hernia, patients with omphalitis or periumbilical fistula and complicated cholecystitis.

The data were collected and a detailed tabulation was developed to record information on preoperative factors included age, gender, body mass index (BMI), and associated medical risk factors, i.e. diabetes mellitus, hypertension, cardiovascular disease, etc.

**Preoperative preparation:**

All patients had routine pre-operative laboratory investigations including complete blood count, liver and kidney function and fasting blood sugar. Diabetic patients were asked to continue their normal regimen. Electrocardiogram was done to all patients, 40 years or over. Abdominal sonography was done for assessment of gallbladder wall thickening, number of gallstones and any other intra-abdominal pathology. All patients received antibiotic prophylaxis with 3rd generation cephalosporine intravenously during induction of anesthesia.

**Operative technique:**

All patients underwent elective operations under general anesthesia, laparoscopic cholecystectomy was performed using the standard four-port method, and then hernia repair was done simultaneously in the same surgery session. For the umbilical port (first port) insertion, an incision at the level of the hernia with isolation of the peritoneal sac. Through a direct cut down to the peritoneum, control of the presence of adherence and prevention of visceral injury, as in an open laparoscopy, then insertion of laparoscopic port (Hasson technique). A purse string suture is placed around the fascia and peritoneum in order to prevent excessive CO<sub>2</sub> leak. Then the abdomen was insufflated to 15 mm Hg. After pneumoperitoneum was achieved, a 30-degree laparoscope was used. The 2nd port is placed in the epigastric region. This port should be placed in a direct line to the infundibulum. This provides a good line for clip placement and avoids unnecessary torque on the instruments. A 5-mm port is then placed in the right anterior axillary line along the costal margin, between the 12th rib and the iliac crest. The final 5-mm port is placed in the midclavicular line. Both of the 5-mm ports should be 2 fingerbreadths below the right costal margin and should be 7 to 10 cm apart.

The patient can be placed in reverse Trendelenburg position to allow the duodenum, stomach, and other intra-abdominal contents to fall away from the dissection field. A 5-mm locking grasper is placed through the most lateral port, and the gallbladder is retracted cephalad, toward the patient's right shoulder, A second grasper is placed through the medial 5-mm port and used to retract the infundibulum of the gallbladder laterally

(to the patient's right side) and inferiorly, opening up the triangle of Calot and better exposing the cystic structures. Using a Maryland dissector through the epigastric port, any adhesions between the gallbladder and the omentum, hepatic flexure, stomach, and duodenum are taken down by grasping them close to the gallbladder and peeling them down along the axis of the cystic duct. The dissection of the triangle of Calot is best performed laterally to medially, first exposing the infundibulum–cystic duct junction on the patient's right side, then medially. The cystic duct is circumferentially dissected. The cystic artery, which is usually medial and superior with the infundibulum retracted laterally, is then dissected circumferentially in similar fashion using the Maryland dissector. The cystic duct was ligated with clips applied with a 10-mm clip applicator through the epigastric port. Two clips were placed distally and one proximally on the duct. A curved or hook scissors used to divide between the most proximal and the two distal clips. The cystic artery was clipped in similar fashion and divided with the scissors, leaving two clips on the distal, retained stump. The gallbladder was dissected out of the gallbladder fossa using electrocautery. This dissection is performed from the infundibulum to the fundus. Gall bladder was taken out off through epigastric port. The patient was returned to a flat, supine position. The

field was irrigated to ensure no bleeding or bile leakage. Drain were placed routinely in the operative bed (Morris pouch).

**Regarding to Para- umbilical hernia repair:** The camera was placed through the epigastric port and the fascial defect was closed primarily by interrupted polypropylene sutures, the skin was closed with absorbable subcuticular vicryl.

Operative time, postoperative complications, length of hospital stay were recorded. All patients were followed up on outpatient basis. They were scheduled for weekly visits in the first month, then every 2 weeks in the second month and once every month for the following 6 months, and finally 2 years postoperative for recurrence.

#### **Statistical Analysis:**

Results were tabulated and statistically analyzed by using a personal computer using MICROSOFT EXCEL 2016 and SPSS v. 21 (SPSS Inc., Chicago, IL, USA). Statistical analysis was done using. Descriptive: e.g. percentage (%), mean and standard deviation. analytical: that includes t-test to compare quantitative data and Chi-square test and Fisher's exact test to compare qualitative data. A value of P less than 0.05 was considered statistically significant.

## RESULTS

A Retrospective study during the period from January 2017 to January 2019 and included Twenty-five patients at Al-Azhar university hospitals with chronic calcular cholecystitis accompanied by Para-umbilical hernia who underwent laparoscopic cholecystectomy and Para-umbilical hernia repair simultaneously. All patients had been consented for laparoscopic cholecystectomy with paraumbilical hernia repair.

The mean age for cases with recurrence is  $48 \pm 1.4$  and the mean age for cases without recurrence is  $44 \pm 8.2$  with no statistically significant difference between the 2 groups. As regard to gender 50% are male and 50% are female for recurrence group, for cases without recurrence 8.7% are male and 91.3% are female with no statistically significant difference between the 2 groups. As regard to special habits 1 case is smoker for recurrence group, for cases without recurrence 4.3% are smoker, and 95.7% are with no special habits with statistically significant difference between the 2 groups. The mean BMI for cases with recurrence is  $35.5 \pm 8.08$  and the mean BMI for cases without recurrence is  $29.6 \pm 2.7$  with statistically significant difference between the 2 groups (**Table 1**).

All cases with recurrence have DM and hypertension while cases with no recurrence 87.3% have no comorbidities, 4.3% have DM, 13% have hypertension and 4.3% have both DM and hypertension with statistically significant difference between the 2 groups. As regard to size of the defect for cases with recurrence and cases with no recurrence are  $2.4 \pm 0.7$  and  $1.3 \pm 0.4$  respectively with statistically significant difference between the 2 groups (**Table 1**).

The mean time of operation for cases with recurrence and cases with no recurrence are 90.00 and  $49.5 \pm 7.2$  minutes respectively with statistically significant difference between the 2 groups. Mean hospital stay for cases with recurrence and cases with no recurrence are  $6 \pm 1.4$  and  $1.4 \pm 1.03$  days respectively with statistically significant difference between the 2 groups. Mean time to return to work for cases with recurrence and cases with no recurrence are  $23 \pm 2.8.4$  and  $10.7 \pm 4.2$  days respectively with statistically significant difference between the 2 groups 50% of cases with recurrence have complication in form of haematoma and 50% have chest infection .cases without recurrence 95.7% have no complication and 4.3% have wound infection with statically significant difference between the 2 groups.

**Table (1): Socio-demographic data, relation between presence of comorbidities and size of the defect and recurrence, time of operation, hospital stay and return to work and recurrence, complication and recurrence**

Parameters		Recurrence		P value
		Yes (2)	No (23)	
Age		48±1.4	44±8.2	0.515
Gender	Males	1(50%)	2(8.7%)	0.08
	Females	1(50%)	21(91.3%)	
Special Habits	Smoker	1(50%)	1(4.3%)	0.022
	No	1(50%)	22(95.7%)	
BMI		35.5±8.08	29.6±2.7	0.019
Comorbidities	No	0	18(87.3%)	0.001
	DM	0	1(4.3%)	
	Hypertension	0	3(13%)	
	DM & hypertension	2(100%)	1(4.3%)	
Size of the defect		2.4±.07	1.3±.4	0.001
Time of operation (minutes)		90.00	49.5±7.2	0.001
Hospital stay (days)		6±1.4	1.4±1.03	0.000
Return to work (days)		23±2.8	10.7±4.2	0.001
Complications	No	0	22(95.7%)	<0001
	Haematoma	1(50%)	0	
	Wound infection	0	1(4.3%)	
	Chest infection	1(50%)	0	

There was moderate positive correlation between BMI and both time of operation and Length of hospital stay. There was strong positive correlation between Size of hernia and

both time of operation and Length of hospital stay, and strong positive correlation between Comorbidity and both time of operation and Length of hospital stay (**Table 2**).

**Table (2): The effect of BMI, Size of hernia & Comorbidity on time of operation & Length of hospital stay**

Parameters		Values	Time of operation	Length of hospital stay
BMI	r- value		0.433	0.487
	P value		0.031	0.014
Size of hernia	r- value		0.712	0.842
	P value		0.001	0.001
Comorbidity	r- value		0.856	0.418
	P value		0.001	0.038

81.8% of cases with no complication have no comorbidity and all cases with complication

complaining of DM and hypertension (**Table 3**).

**Table (3): The effect of comorbidity disease on the complications**

<b>Complications</b> <b>Comorbidity</b>	No	Haematoma	Wound infection	Chest infection	<b>P value</b>
<b>No</b>	18(81.8%)	0	0	0	0.003
<b>DM</b>	1(4.5%)	0	0	0	
<b>Hypertension</b>	3(13.6%)	0	0	0	
<b>DM &amp; hypertension</b>	0	1(100%)	1(100%)	1(100%)	

## DISCUSSION

In this study, female to male incidence was 7.6:1 and this incidence was close to the work of *Zoricic et al. (2013)* which was 8.9:1. This did not go with *Bozkırlı et al. (2012)* who had female to male incidence about 2:1. This is probably due to the differences socioeconomic class and the social habits.

The mean age of the studied groups of patients in this work was 44.4 years. It was older than that of *Bozkırlı et al. (2012)* (43.6 years) and *Zoricic et al. (2013)* (37.1 years). However, the elderly patients are not concerned with the problem of attractiveness.

In our study, the mean BMI for cases with recurrence was  $35.5 \pm 8.08$  and the mean BMI for cases without recurrence was  $29.6 \pm 2.7$  with statistically significant difference between the 2 groups.

Cases without recurrence 4.3% were smoker and 95.7% were with no special habits with statistically significant difference between the 2 groups.

Among the 25 patients had received simultaneous paraumbilical hernia repair with LC included in this study, 1 patient were diabetics, 3 patients were hypertensive and 1 patient were diabetics and hypertensive.

There was a strong positive correlation between comorbidity and both time of

operation and length of hospital stay. This result was against *Bozkırlı et al. (2012)* who mentioned that the comorbidity factors not affected the operative time but had negative impact on the both length of hospital stay and return to work.

In our study, 81.8% of cases were with no complication have no comorbidity and all cases with complication complaining of DM and hypertension. The shortening of hospital stay influences the reduction of costs, minimization of the patient discomfort and the reduction of complications.

Mean hospital stay for cases with recurrence and cases with no recurrence were  $6 \pm 1.4$  and  $1.4 \pm 1.03$  days respectively with statistically significant difference between the 2 groups.

Mean time to return to work for cases with recurrence and cases with no recurrence were  $23 \pm 2.84$  and  $10.7 \pm 4.2$  days respectively with statistically significant difference between the 2 groups and the mean time of operation for cases with recurrence and cases with no recurrence were 90.00 and  $49.5 \pm 7.2$  minutes respectively with statistically significant difference between the 2 groups. This result agreed with *Bozkırlı et al. (2012)* who mentioned that decreasing the length of hospital stay time may improve patient comfort and expedite recovery. *Zoricic et al. (2013)* showed no

significant difference was detected in terms of mean length of hospital stay between the groups.

Recurrence rate is the most important factor in determining the optimal method for LC accompanied by simultaneous para-umbilical hernia repair. High recurrence rates have been reported after suture repair in many studies. Most surgeons currently prefer prosthetic mesh hernioplasty (*Bozkırlı et al., 2012* and *Zoricic et al., 2013*). In our study, 50% of cases with recurrence have complication in form of haematoma and 50% have chest infection. Cases without recurrence 95.7% have no complications and 4.3% have wound infection with statistically significant difference between the 2 groups.

### CONCLUSION

Para-umbilical hernia repair (PUHR) combined with LC result in longer time of operation, longer anesthesia, and risk of increased blood loss. However, it has the advantages of single hospital stay, single anesthesia exposure, less post-operative pain and morbidity, early return to work, better cosmesis and more convenient, efficacy and cost effective for the patient. However, the outcomes of the para-umbilical defect repair with mesh after laparoscopic surgeries appear to be better for either obese or non-obese patients than primary suture techniques in recurrence rates. Finally, PUHR combined with LC, kills two pathologies with one scope.

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## تقييم إصلاح الفتق الجار سري المصاحب لعملية إستئصال المرارة بالمنظار

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**خلفية البحث:** يعد إستئصال المرارة بالمنظار العملية الأمثل لمعالجة الالتهاب الحصى المرارى المزمن من حيث قصر مدة الإقامة بالمستشفى وكذلك فترة النقاهة بعد العملية وانخفاض معدلات الألم والمضاعفات المحتملة وكذلك أفضليتها من الناحية التجميلية. يمثل الفتق الجار سري 6% من جميع أنواع الفتق بجدار البطن في البالغين. وقد استخدمت العديد من الطرق الجراحية في علاج الفتق الجارسري، ومع ذلك لا يوجد إجماع حتى الآن حول أفضل طريقة لإصلاح الفتق الجارسري.

**الهدف من البحث:** تقييم طرق الإصلاح المختارة للفتق شبه السري الموجودة بالفعل أو التي تمت مواجهتها بشكل عرضي وتقديم البيانات المتعلقة بالمشاكل المحتملة التي قد تحدث أثناء استئصال المرارة بالمنظار.

**المرضى والطرق البحث:** فى هذه الدراسة خضع خمس وعشرون حالة لإصلاح الفتق الجار سري بعد استئصال المرارة بالمنظار فى نفس العملية. ولقد قمنا بتحليل البيانات الديموغرافية والسريرية ذات الصلة مثل عمر المريض وجنسه ومؤشر كتلة الجسم (ناتج قسمة الوزن بالكيلوجرام على مربع الطول بالمتر) والعوامل المرضية الأخرى مثل الضغط والسكر، وحجم الفتق الجارسري، وطول الإقامة في المستشفى، وملاحظة المضاعفات والفتق المتكرر. وخضع جميع المرضى لإجراء العملية الجراحية تحت التخدير العام، تم إستئصال المرارة بالمنظار باستخدام أربعة فتحات جراحية صغيرة، ومن ثم كان يتم بعدها إصلاح الفتق الجار سري في نفس وقت الجراحة نفسها.

**نتائج البحث:** تم تقسيم المرضى إلى مجموعتين وفقاً لحدوث التكرار، وتشير نتائج الدراسة الحالية إلى أن وقت العملية وآلام ما بعد الجراحة وطول الإقامة في المستشفى وعدوى الجرح والوقت اللازم للعودة إلى العمل أقل في المرضى دون

تكرار من المرضى. مع التكرار. ويحدث التكرار في الحالات مع مؤشر كتلة الجسم  $35.5 \pm 8.08$  ، والمريض المصاب بأمراض مصاحبة مؤشر كتلة الجسم وارتفاع ضغط الدم) وحجم الخلل  $2.4 \pm 0.07$  سم ، والحالات التي تتكرر فيها وقت تشغلي وإقامة في المستشفى أطول من الحالات غير المتكررة وتستغرق أيامًا أكثر للعودة إليها عمل. والحالات التي تتكرر فيها أيضًا مضاعفات أخرى مثل الورم الدموي وعدوى الجرح، وهناك ارتباط إيجابي معتدل بين مؤشر كتلة الجسم ووقت العملية وطول الإقامة في المستشفى. هناك علاقة إيجابية قوية بين حجم الفتق ووقت العملية وطول الإقامة في المستشفى. وهناك علاقة إيجابية قوية بين الاعتلال المشترك ووقت العملية وطول الإقامة في المستشفى.

**الاستنتاج:** إصلاح الفتق المجاور للسرة مع استئصال المرارة بالمنظار يؤدي إلى وقت تشغيل أطول وتخدير أطول وخطر زيادة فقدان الدم. ولكن له مزايا الإقامة الفردية في المستشفى، والتعرض للتخدير الفردي، وتقليل الألم والمرض بعد العملية الجراحية، والعودة المبكرة إلى العمل، وتحسين التجميل، وأكثر ملاءمة، وفعالية، وفعالية من حيث التكلفة بالنسبة للمريض. ويبدو أن استخدام شبكة بعد العمليات الجراحية بالمنظار أفضل للمرضى الذين يعانون من السمنة أو غير البدينين من تقنيات الخياطة الأولية في معدلات التكرار.