

## Uncomplicated Laparoscopic Cholecystectomy to Drain or not to Drain

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### ABSTRACT

**Background:** gallstones are present in about 10% to 15% of adult population. Between 1% and 4% of these adults become symptomatic every year. Laparoscopic cholecystectomy first performed by *philippe Mouret* in Lyon, France in the late 80s, has gained acceptance at the standard of care for patients requiring cholecystectomy. Laparoscopic cholecystectomy provides a safe and effective treatment for most patients with symptomatic gall stones. Laparoscopic cholecystectomy for acute cholecystitis is mainly performed after the acute cholecystitis episode subside because of the fear of higher morbidity and need for conversion from laparoscopic to open cholecystectomy.

**Aim of the Work:** the need for routine abdominal drainage in uncomplicated laparoscopic cholecystectomy. Benefits and harms of intra abdominal drains in uncomplicated laparoscopic cholecystectomy.

**Patients and Methods:** the study included 50 patients from Al Azhar University Hospital and with chronic calculous cholecystitis in period from February 2016 to June 2018. They were randomly assigned into one of the two study groups: Group I: with tubal drains; Group II: without drains. The later group wasn't selected except after making sure that a drain is not required by the operating surgeon. Patients were selected on the basis of the following criteria.?? Ethical approval from local ethical committee of surgery department was obtained.

**Results:** data obtained from the present study were selected statistically analysis computed using SPSS. Continuous data were expressed in the form of mean + SD while categorical data were expressed in the form of count and percent. Comparison of continuous data was performed utilizing student t test, while categorical data were done using chi-square test. P value less than 0.05 was considered statistically significant. In group A (with drain) according to the sex is arranged as 7 male patients and 18 female patients, according to the age is arranged between 23-60 years and according to BMI is arranged between 18-30 (kg/m<sup>2</sup>) in group B (no drain) according to the sex is arranged as 5 male patients and 20 female, according to the age is arranged between 25-60 years and according to the BMI is arranged between 20-35(kg/m<sup>2</sup>). No statistically significant differences between the two studied groups according to demographic data.

**Conclusion:** use of drain didn't result in reduction of postoperative complications. It was also associated with prolonged operative time, higher pain levels and longer hospital stay.

**Keywords:** Uncomplicated Laparoscopic Cholecystectomy, Pneumoperitoneum.

### INTRODUCTION

Gallstones are present in about 10% to 15% of adult population. Between 1% and 4% of these adults become symptomatic every year <sup>(1)</sup>.

Laparoscopic cholecystectomy first performed by *philippe Mouret* in Lyon, France in the late 80s, has gained acceptance at the standard of care for patients requiring cholecystectomy. Laparoscopic cholecystectomy provides a safe and effective treatment for most patients with symptomatic gall stones <sup>(2)</sup>.

Laparoscopic cholecystectomy for acute cholecystitis is mainly performed after the acute cholecystitis episode subside because of the fear of higher morbidity and need for conversion from laparoscopic to open cholecystectomy. Despite the many advantages of laparoscope over open surgery, many patients complain about referred pain to the shoulder during the postoperative course <sup>(3)</sup>. High pressure pneumoperitoneum using carbon dioxide gas was accused for those complications <sup>(4)</sup>.

A drainage tube is inserted to reduce pain after laparoscopy <sup>(5)</sup>. Routine drain use

after Laparoscopic cholecystectomy is still debatable. The main indication for drain use after Laparoscopic cholecystectomy is to prevent a biloma or hematoma. According to the Cochrane Database systemic Review; randomized clinical studies show no benefit of a drain <sup>(1)</sup>.

Drains are used after Laparoscopic cholecystectomy to prevent abdominal collections. However, drain use may increase infective complications and delay patient discharge <sup>(1)</sup>.

The insertion of a sub-hepatic drain after elective Laparoscopic cholecystectomy increases post-surgical pain, prolongs hospital stay and do not prevent the occurrence of intra-abdominal abscesses <sup>(6)</sup>.

There is no proof that the drain was useful in elective uncomplicated Laparoscopic cholecystectomy <sup>(7)</sup>.

Recently, *Kim et al.* concluded that routine use of a drain after Laparoscopic cholecystectomy for an acutely inflamed gallbladder had no effect on the postoperative morbidity <sup>(8)</sup>.

In fact, although the issue of drain use in open cholecystectomy has been adequately addressed by prospective randomized trials, there is lack of evidence on the usefulness of drains in elective Laparoscopic cholecystectomy, the surgeons follow their beliefs and bias on this debate <sup>(9)</sup>.

## AIM OF THE WORK

**The aim of the study is to assess:** The need for routine abdominal drainage in uncomplicated laparoscopic cholecystectomy. Benefits and harms of intra abdominal drains in uncomplicated laparoscopic cholecystectomy.

## PATIENTS AND METHODS

The present study is a randomized controlled study.

### PATIENTS

The study included 50 patients from Al azhar University Hospital and with chronic calculous cholecystitis in period from February 2016 to June 2018. They were randomly assigned into one of the two study groups: Group I: with tubal drains; Group II: without

drains. The later group wasn't selected except after making sure that a drain is not required by the operating surgeon. Patients were selected on the basis of the following criteria. Ethical approval from local ethical committee of surgery department was obtained.

### Inclusion criteria

Patients were selected to participate in the study if they have chronic calculous cholecystitis.

### Exclusion criteria

1. Acute cholecystitis.
2. Acute Cholangitis.
3. Acute Pancreatitis.
4. Previous major abdominal operation.
5. Intra-operative bleeding & biliary leakage.
6. Patient requires common bile duct exploration or any other additional procedure.
7. Bleeding tendency.
8. Patient refusal to laparoscopic cholecystectomy.
9. Difficult cases require additional procedures e. g adhesion, pyocele.

## METHODS

*All participants were subjected to the following:*

- **History taking:** personal history, history of present illness, past history and family history.
- Clinical examination; general and local abdominal examination.
- Routine laboratory investigations; CBC, liver function test, kidney function test and coagulation profile.
- Abdominal ultrasonography.
- Laparoscopic cholecystectomy.

### Operative technique:

All patients were subjected to automatic insufflations by carbon dioxide under 14mmHg pressure. The patients were divided into two groups; group I with tubal drain (25 patients), group II without drain (25 patients).

### Postoperative care:

The perioperative variables (operative time, postoperative pain, and postoperative hospital stay) were evaluated. We checked for postoperative pain using a visual analog scale (VAS) from 0 (no pain) to 10 (worst pain imaginable) 12 h after the operation.

**Statistical Analysis**

Data obtained from the present study were selected statistically analysis computed using SPSS. Continuous data were expressed in the form of mean + SD while categorical data were expressed in the form of count and

percent. Comparison of continuous data was performed utilizing student t test, while categorical data were done using chi-square test. P value less than 0.05 was considered statistically significant.

**RESULTS**

**Table (1):** Comparison between the two studied groups according to demographic data

	Group A (n=25)		Group B (n=25)		Test of sig.	p
	No.	%	No.	%		
<b>Sex</b>						
Male	7	28.0	5	20.0	X <sup>2</sup> = 0.439	0.508
Female	18	72.0	20	80.0		
<b>Age (years)</b>						
Min. – Max.	23.0 – 60.0		25.0 – 60.0		t=0.140	0.889
Mean ± SD.	41.96 ± 10.43		42.36 ± 9.79			
Median	42.0		42.0			
<b>BMI (kg/m<sup>2</sup>)</b>						
Min. – Max.	19.0 – 38.0		20.0 – 38.0		t=0.569	0.572
Mean ± SD.	27.76 ± 4.60		28.48 ± 4.34			
Median	28.0		28.0			

χ<sup>2</sup>, p: χ<sup>2</sup> and p values for **Chi square test** for comparing between the two groups  
t, p: t and p values for **Student t-test** for comparing between the two groups

This table shows no statistically significant differences between the studied groups regarding the demographic data.

**Table (2):** Comparison between the two studied groups according to operative time

Operative time	Group A (n=25)	Group B (n=25)	t	P
Min. – Max.	55.0 – 85.0	50.0 – 67.0	4.795*	<0.001*
Mean ± SD.	65.28 ± 8.98	55.32 ± 5.21		
Median	64.0	54.0		

t, p: t and p values for **Student t-test** for comparing between the two groups  
\*: Statistically significant at p ≤ 0.05

Patients in the drain group had significantly longer operative time when compared with patients with no drain.

**Table (3):** Comparison between the two studied groups according to postoperative complications

Postoperative complications	Group A (n=25)		Group B (n=25)		X <sup>2</sup>	P
	No.	%	No.	%		
No	13	52.0	12	48.0	0.080	0.777
<b>Yes</b>	<b>12</b>	<b>48.0</b>	<b>13</b>	<b>52.0</b>		
Wound infection	4	33.3	1	7.7	5.281	MC p= 0.604
Nausea and vomiting	3	25.0	5	38.5		
Bile leak	1	8.3	1	7.7		
Fever	2	16.7	2	15.4		
Peri hepatic collection	1	8.3	3	23.1		
Acute pancreatitis	1	8.3	0	0.0		
Prolonged shoulder pain	0	0.0	1	7.7		

χ<sup>2</sup>: **Chi square test** for comparing between the two groups  
MC p: p value for **Monte Carlo** for Chi square test for comparing between the two groups

No statistically significant differences between the studied groups regarding the postoperative complications.

**Table (4):** Comparison between the two studied groups according to pain

Pain	Group A (n=25)		Group B (n=25)		Test of sig.	p
	No.	%	No.	%		
<b>Grade</b>						
Mild	9	36.0	5	20.0	X <sup>2</sup> = 1.587	0.208
Moderate – Severe	16	64.0	20	80.0		
<b>Score</b>						
Min. – Max.	3.0 – 9.0		2.0 – 6.0		U= 70.50*	<0.001*
Mean ± SD.	6.0 ± 1.55		3.56 ± 1.19			
Median	6.0		3.0			

χ<sup>2</sup>, p: χ<sup>2</sup> and p values for **Chi square test** for comparing between the two groups

U, p: U and p values for **Mann Whitney test** for comparing between the two groups

\*: Statistically significant at p ≤ 0.05

Patients in the drain group had significantly higher pain scores and higher frequency of moderate sever pain states when compared with patients without drain.

**DISCUSSION**

Laparoscopic cholecystectomy provides a safe and effective treatment for patients with gallstones (2). As it reduces postoperative pain with almost invisible scar, short hospital stay and earlier return to work (10). On the other side, many patients complain of abdominal pain, shoulder tip pain, and nausea/vomiting postoperatively (11). High pressure pneumoperitoneum using carbon dioxide gas was accused for those complications (4).

Thus, a drainage tube is inserted (5).The value of surgical drainage in open cholecystectomy is an issue that is not resolved till now (12).The same in laparoscopic cholecystectomy, where the lack of evidence on usefulness of drain is present. Again surgeons keep being divided among those placing a drain selectively, and those who never place a drain, based on their personal experience, beliefs, or bias (13).

The present study aimed to assess the benefits and harms of routine abdominal drainage in uncomplicated laparoscopic cholecystectomy.To get this target accomplished, the study recruited 50 patients indicated for laparoscopic cholecystectomy. They were equally and randomly assigned into one of two groups: group 1 that had operative drain inserted and group 2 that had no drain. Comparison between the studied groups regarding age and sex didn't reveal statistically significant differences as intentionally designed.

In addition, we found no statistically significant differences between the studied groups regarding reported associated comorbidities. This is in agreement with the study of *Ishikawa et al.* (14).

Allocation to drain or not to drain was non-randomized and based on surgeon preference according to intraoperative findings. Patient characteristics, operative results, and postoperative outcomes were compared between the two groups with univariate analysis. The study reported no statistically significant differences between groups regarding the associated medical conditions.

In the current study, patients in the drain group had significantly longer operative time when compared with patients with no drain. No statistically significant differences between the studied groups regarding the blood loss.

This is in harmony with the study of *El-Labban et al.* (15). In their research, a controlled randomized trial was designed to assess the value of drains in elective laparoscopic cholecystectomy. During a two-year period, 80 patients were simply randomized to have a drain placed (group A), an 8-mm pentose tube drain was retained below the liver bed, whereas 80 patients were randomized not to have a drain (group B) placed in the subhepatic space. They reported a significantly longer operative time in the

drain group when compared with the other group.

However, in the study of *Picchio et al.*<sup>(7)</sup> whose study was designed to assess the role of drains in laparoscopic cholecystectomy performed for non acutely inflamed gallbladder found no statistically significant differences between patients with drain and patients without regarding the operative time.

This may be explained by the variable surgical characteristics of the studied patients. Regarding the reported complications, the present study found no statistically significant differences between the studied groups. This results performed a retrospective review of all patients who had cholecystectomy for acute cholecystitis aiming to answer the question whether to drain or not to drain after cholecystectomy for acute calculi cholecystitis. They noted no statistically significant differences between patients using or not using drain regarding the reported postoperative complications.

In the study of *Kim et al.*<sup>(16)</sup>, patients were randomly assigned to undergo drain insertion (94 patients, 48.7%, group A) or not (99 patients, 51.3%, group B). In 18 cases (9.3%), postoperative morbidities such as bleeding, bile leakage, wound infection or an abscess occurred, and there was no significant difference between the two groups.

In our study, patients in the drain group had significantly higher pain scores and higher frequency of moderate- severe pain states when compared with patients without drain. This is in line with the study of *Tzovaras et al.*<sup>(9)</sup>.

In a study of *Kim et al.*<sup>(8)</sup>, a controlled randomized trial was designed to assess the value of drains in elective laparoscopic cholecystectomy. 284 patients were randomized to have a drain placed (group A), whereas 281 patients were randomized not to have a drain (group B) placed in the subhepatic space. Postoperative pain was significantly increased in patients who had a drain placed; median visual analog scale (VAS) score was 5 (range 1 to 8) versus 3 (range 1 to 8), in the non-drained group ( $P < .0001$ ). Our data are also in agreement with the former study

Finally, we noted that patients in the drain group had significantly longer hospital stay when compared with patients in the other group. No mortality was reported. This is in agreement with the study of *Georgiou et al.*<sup>(17)</sup>.

They evaluated drainage of the gallbladder bed after elective LC. One hundred sixteen patients were randomly allocated in two groups, sustained an uneventful LC, and were included in the study after an informed consent was obtained. Sixty-three patients were included in drainage group (YD) and 53 patients in non drainage group (ND). They reported a significantly longer hospital stay.

## CONCLUSION

Use of drain didn't result in reduction of postoperative complications. It was also associated with prolonged operative time, higher pain levels and longer hospital stay.

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