



## “A Clinical study to compare drain vs no drain in elective laparoscopic cholecystectomy”

### Surgery

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### ABSTRACT

**OBJECTIVE:** Laparoscopic cholecystectomy is the main method of treatment of gallstones. Routine drainage after laparoscopic cholecystectomy is an issue of considerable debate. Therefore, a controlled randomised trial was designed to assess the value of drains in elective laparoscopic cholecystectomy.

**MATERIALS AND METHODS:** During the period of one year 100 patients with symptomatic or asymptomatic cholelithiasis diagnosed clinically and by ultrasound were subjected to laparoscopic cholecystectomy making two groups A and B, with drain and without drain respectively. The volume of the fluid collection detected in the sub hepatic area by ultrasonography in the postoperative days was recorded along with postoperative pain, wound infection, and duration of hospital stay.

**RESULTS:** Patients in drain group had more pain compared to without drain group. VAS median grade in without drain group was G2(54%) and VAS median grade in patients with drain group was G3(62%). Wound infection was noted in 4(04%) patients in the drain group and 2(02%) patients without drain group. Mean sub hepatic collection noted in patients with drain on 3rd day was 36.6+/-15.3 ml and on 7th day was 22.6+/-11.3ml. Mean sub hepatic collection in patients without drain on 3rd day was 25+/-9.5 ml and 7th day 12.16+/-8.7 ml. None of the patients required any intervention and were managed conservatively. Majority of patients in drain group had more subhepatic collection when compared to without drain group. Mean hospital stay in patients with drain was 7.4 +/- 1.2 days and patients without drain were 5.1 +/- 1.6 days. Majority of patients with drain group stayed longer time period compared to drain group.

**CONCLUSION:** In conclusion, there is no relationship between the presence of a drain after laparoscopic cholecystectomy and the presence of postoperative fluid collection. The routine use of a drain in non-complicated laparoscopic cholecystectomy has nothing to offer; in contrast, it is associated with longer hospital stay.

### KEYWORDS:

Laparoscopic cholecystectomy, drains, ultrasonography.

### INTRODUCTION:

Laparoscopic cholecystectomy provides a safe and effective treatment for patients with gallstones<sup>1</sup> as it reduces post-operative pain with almost inadvisable scar, short hospital stay and earlier return to work.<sup>2</sup> On the other side, many patients complain of abdominal pain, shoulder tip pain, and nausea/vomiting post-operatively.<sup>3</sup> High pressure pneumoperitoneum using carbon dioxide gas was accused for those complications.<sup>4</sup> Thus, a drainage tube is inserted.<sup>5</sup> The value of surgical drainage in open cholecystectomy is an issue that is not resolved till now.<sup>6</sup> 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.<sup>7</sup> Prophylactic drains in abdominal surgery are widely used either to detect early complications, such as postoperative haemorrhage or leakage, or to remove collections that might be toxic, such as bile, and become infected. However, evidence-based data do not support the use of prophylactic drainage in the majority of abdominal surgery procedures. With the advent of LC, the use of drains may be justified because of the increased incidence of biliary injury and, consequently, bile leakage. The use of prophylactic drainage in LC to avoid bile and blood collection requiring subsequent treatment is largely diffuse. We aimed to evaluate the benefits of drain use after laparoscopic cholecystectomy.

### AIMS AND OBJECTIVES:-

1. To compare the volume of the fluid collection detected in the sub hepatic area by ultrasonography in the postoperative days in drain and no drain groups.
2. To compare the postoperative pain, wound infection, and duration of hospital stay in drain versus no drain groups.

### MATERIALS AND METHODS:

The present study was conducted on 100 patients in the Department of Surgery, JA Group of Hospitals and GR Medical College, Gwalior (MP) during September 2014 to August 2015 with symptomatic or asymptomatic cholelithiasis diagnosed clinically and by ultrasound

who were subjected to laparoscopic cholecystectomy during the period of one year making two randomly divided groups of 50 each as A and B, with drain and without drain respectively. Randomisation was done by toss a coin method. The volume of the fluid collection detected in the sub hepatic area by ultrasonography in the postoperative days was recorded along with postoperative pain (Visual Analog scale), wound infection, and duration of hospital stay.

Standard postoperative care was given to all the patients including antibiotics, wound care and analgesics, irrespective of wound status during postoperative period.

### Inclusion criteria:

1. Patients having symptomatic/asymptomatic cholelithiasis confirmed on usg.
2. Patients who underwent uncomplicated laparoscopic cholecystectomy.

### Exclusion criteria:

1. Acalculous cholecystitis
2. Acute cholecystitis
3. GB Carcinoma
4. GB Polyps
5. Calculus cholecystitis associated with pyocele and obstructive jaundice.

### DATA COLLECTION AND STATISTICAL ANALYSIS:

The data were collected directly from the patient in the form of history and clinical examination. The follow-up and documentation of postoperative wound complications, hospital stay were done according to the pro forma. Analysis was done using unpaired t test for continuous numerical values, and chi square test for categorical values. Tables were analyzed using SPSS software.

### RESULTS:

#### Post Operative Pain

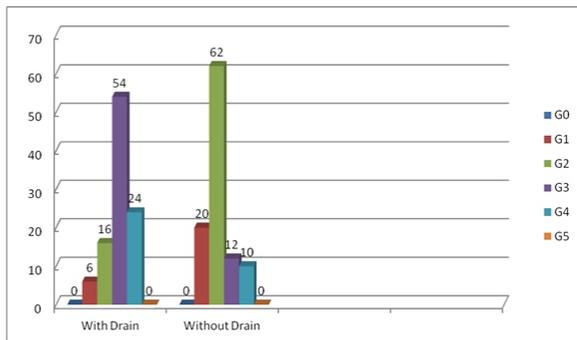
**Table 1**

Pain	With Drain		Without drain		Total	
	No.	%	No.	%	No.	%
G0	0	0	0	0	0	0
G1	03	06	10	20	13	13
G2	08	16	31	62	39	39
G3	27	54	06	12	33	33
G4	12	24	03	06	15	15
G5	0	0	0	0	0	0

X<sup>2</sup>=27.2,  
P<0.001HS

In this present study VAS median grade in patients with drain was G3 (54%), followed by G4 (24%). VAS median grade in without drain group was G2 (62%), followed by G1 (20%) and then G3 (12%). P<0.001, there was statistically significant difference observed between the two study groups.

**Graph.1**



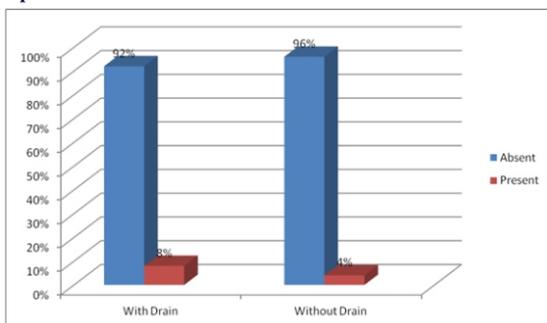
**Post Operative Wound Infection**

**Table 2**

Wound Infection	With Drain	Without Drain
Absent	46(92%)	48(96%)
Present	04(08%)	02(04%)

In the present study wound infection was noted in 4(08%) patients in the drain group and 2(4%) patients without drain group. There was no statistically significant difference noted between the two study groups.

**Graph.2**



**Sub Hepatic Collection**

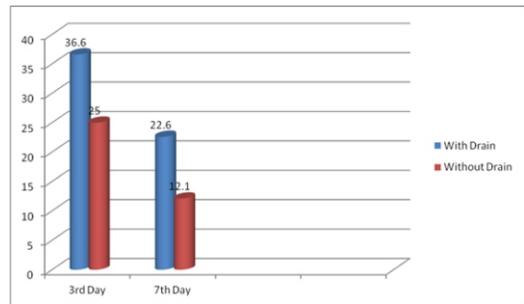
**Table 3**

Sub Hepatic Collection(i n ml)	With Drain		Without Drain			
	Mean	SD	Mean	SD	Mean Difference	P*Value, Sig.
3 <sup>rd</sup> POD	36.6	15.3	25	9.5	11.6	<0.001HS
7 <sup>th</sup> POD	22.6	11.3	12.1	8.7	10.5	<0.001HS

\*Student's unpaired t test

In the present study mean sub hepatic collection noted in patients with drain on 3<sup>rd</sup> day was 36.6+/-15.3 ml and on 7<sup>th</sup> day was 22.6+/-11.3ml. Mean sub hepatic collection in patients without drain on 3<sup>rd</sup> day was 25+/-9.5 ml and on 7<sup>th</sup> day 12.16+/-8.7 ml. P<0.001, there was statistically significant difference noted between the two groups.

**Graph.3**



**Post-Operative Hospital Stay (Days)**

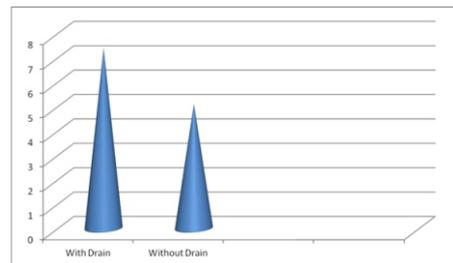
In the present study the mean hospital stay in patients with drain was 7.4 +/- 1.2 days and patients without drain was 5.1 +/- 1.6 days. P<0.001, there was statistically significant difference noted between two groups.

**Table 4**

Hospital Stay (Days)	With Drain		Without Drain		Mean Difference	P*Value, Sig
	Mean	SD	Mean	SD		
Hospital Stay (Days)	7.4	1.2	5.1	1.6	2.3	<0.001HS

\*Student's unpaired t test

**Graph.4**



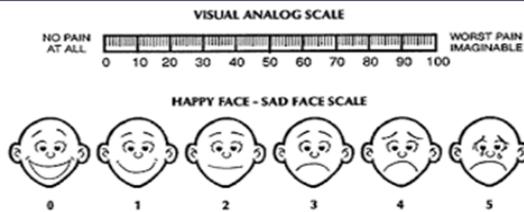
**DISCUSSION**

The prevalence of cholelithiasis varies widely in different parts of the world. In India it is estimated to be around 4%. The use of drains following cholecystectomy remains controversial.<sup>8, 9, 10, 11</sup> Although there is no supporting scientific evidence; it would not be a mistake to call the routine use of drains after abdominal operations a traditional practice. In view of the higher probability of preventing surgical complications, such as leaks and bleeding or of early detection with a drain, the frequency of drain use can be better understood. Other studies claim that closed drainage systems are not useful after abdominal operations, such as cholecystectomy<sup>12</sup>, colorectal resection, and pancreatic resection and suggest that drain use increases the likelihood of intra-abdominal and wound site infections and hence the duration of hospitalization with worsening lung function

**POST OPERATIVE PAIN**

In this present study VAS median grade in patients with drain was G3 (54%), followed by G4 (24%). VAS median grade in without drain group was G2 (62%), followed by G1 (20%) and G3 (12%). Patients in drain group have more pain compared to without drain group. Pain score (VAS): -

- Grade0: Almost pain free
- Grade1: Slight pain
- Grade2: Average pain
- Grade3: More than average pain
- Grade4: Moderate pain
- Grade5: Severe pain



**POST OPERATIVE WOUND INFECTION**

**Table.5** Describing wound infection in different studies

Study	Drain	No Drain
Druart	01/26	0/24
Lewis	08/246	06/248
Huguier	03/50	02/50
Bawahab	1/38	1/65
<b>Present Study</b>	<b>04/50</b>	<b>02/50</b>

In the present study 02(2%) patient in without drain group and 04(4%) patients in drain group developed postoperative wound infection. In Lewis study 6(2.4%) patients in without drain group and 8(3.2%) patients with drain group developed wound infection. Similar results were noted in **Druart** and **Huguier**<sup>13</sup> study subgroup. In **Bawahab**<sup>14</sup> study, 1(2.6%) patient in with drain group and 1(1.54%) patient in without drain group developed wound infection.

**SUBHEPATIC COLLECTION**

**Table.6** Describing sub hepatic collection in different studies.

Study	Drain		No drain	
	N	Mean (SD)	N	Mean (SD)
Lucarelli	53	55(23.2)	53	77(26.02)
Pichhio	15	30(5)	15	30(5)
Shamim	79	3.13(3.6)	76	2.85(3.6)
<b>Present Study</b>	<b>50</b>	<b>22.6(11.3)</b>	<b>50</b>	<b>12.16(8.7)</b>

In the study conducted by **Lucarelli**<sup>15</sup> mean subhepatic collection on 7<sup>th</sup> day was 55+/-23.2ml in drain group and 77+/-26.02ml in without drain group. In study conducted by **Picchio**<sup>16</sup> mean sub hepatic collection was 30+/-5ml in drain and in without drain group.

Similar study conducted by **Shamim**<sup>17</sup> showed mean subhepatic collection of 3.13+/-3.6 ml in drain group and 2.85+/-3.6 ml collection in without drain group.

In the **present study** mean sub hepatic collection noted in patients with drain on 3<sup>rd</sup>

day was 36.6+/-15.3 ml and on 7th day was 22.6+/-11.3ml. Mean sub hepatic collection in patients without drain on 3rd day was 25+/-9.5 ml and on 7th day 12.16+/-8.7 ml. P<0.001, there was statistically significant difference noted between the two groups.

**HOSPITAL STAY**

**Table.7** Describing hospital stay in different studies

	Drain		No Drain	
	N	Mean(SD)	N	Mean(SD)
Lewis	246	5.9(2)	248	5.5(2)
Gurer	51	4(2.9)	241	2.9(1.9)
Bawahab	38	4.48(2.18)	65	2.50(2.20)
<b>Present Study</b>	<b>50</b>	<b>7.4(1.2)</b>	<b>50</b>	<b>5.1(1.6)</b>

In the study conducted by **Lewis** subgroup post operative hospital stay was 5.9+/-2 days in drain group and 5.5+/-2 days in without drain group. Similar studies showed that post operative hospital stay was longer in drain group compared to without drain group.

In the study conducted by **Gurer**<sup>18</sup>, hospital stay in drain group was 4+/-2.9 days and in without drain group was 2.9+/-1.9 days. Studies conducted in **Bawahab**<sup>14</sup> study showed hospital stay of 4.48+/-2.18 days in patients with drain group and of 2.5+/- 2.2 days in patients of without drain group. In the **present study** post operative hospital stay in drain group was 7.4+/-1.2 days and without drain group was 5.1+/-1.6 days.

**CONCLUSION:**

In conclusion, there is no relationship between the presence of a drain after laparoscopic cholecystectomy and the presence of postoperative fluid collection. The routine use of a drain in non-complicated laparoscopic cholecystectomy has nothing to offer; in contrast, it is associated with longer hospital stay.

**Declarations:**

**Funding:** None

**Conflict of interest:** None declared

**Ethical approval:** Obtained from ethical committee GRMC Gwalior

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