

## Overnight Observation Post Laparoscopic Cholecystectomy

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**BACKGROUND:** Laparoscopic cholecystectomy is the treatment of choice for symptomatic gall bladder stone. There is controversy regarding the optimal candidate and postoperative observation time for patients post laparoscopic cholecystectomy. **OBJECTIVES:** To identify clinical and surgical factors, which could determine if patient need to be kept either as 24-hour observation or discharge home at same day post elective laparoscopic cholecystectomy. **METHODS:** A retrospective review was performed from January 2017 to May 2020 on consecutive patients undergoing laparoscopic cholecystectomy, patients' demographics, surgical and postoperative details were analyzed. **RESULT:** 203 laparoscopic cholecystectomies were performed, the median age was 38 (IQR, 20–50) years, mean postoperative stay was  $1.2 \pm 0.57$  days. Fifteen (7.4%) patients were discharged home at the same day. Three (1.5%) patients were re-admitted; 149 (71.8%) patients might be discharged home at same day. **CONCLUSION:** The majority of patients can be successfully managed with day care laparoscopic cholecystectomy without overnight stay. The median time of 4 hrs. is sufficient for postoperative observation. The main significant factor for overnight observation in this study was drain presence

### 1-Introduction

The gallbladder (GB) diseases have undergone major changes in its surgical management during the last three decades.<sup>1,2</sup> Starting from open cholecystectomy, which in 1882 the first cholecystectomy is performed.<sup>3,4</sup> Then a diverse technique for

cholecystectomy was instituted, propagated by surgeons in France and the United States, also described briefly that it involves the use of a laparoscope and instrument insertion through trocars, thereby avoiding the classic incision.<sup>5</sup> Based on the initial experiences of the surgeons with LC, they have become increasingly confident of discharging patients of all ages early, which saves

considerable monetary and human resources.<sup>6</sup>

As LC is minimally invasive surgery, it facilitates faster patient recovery with minimal nursing assistance, so it is ideal to be listed as day-case procedures.<sup>6</sup> Although there is lack of data associated with DCLC from developing countries,<sup>7,8</sup> a recent review performed in a developing country reported that the choice of admitting patients overnight was mostly due to patients' preference, more than any clinical reason.<sup>7</sup>

Review of outcomes for LC reconfirms the established principle that LC is safe and may be performed with minimum morbidity

pooled prevalence range(1.6–5.3%)and mortality (0.08–0.14%).<sup>9</sup>

The aim of this is to identify clinical and surgical determinants if patient need to be kept either as 24-hour observation or same day discharge home post elective laparoscopic cholecystectomy.

## 2- Study design, Study population, and Study area:

This study is retrospective, cross section descriptive, hospital-based study. The sample size of the study was consisting of all patient who underwent LC and

patients at least with one exclusion criteria were excluded. The study period between 1st January 2017 to May 2020 in Taiz city.

### Inclusion criteria

All patients of all ages and both gender who admitted to the hospital to carry out elective laparoscopic cholecystectomy.

### Exclusion criteria

Patients who underwent open cholecystectomy, LC associated with other surgical procedures, as (hernioplasty and appendectomy, etc.), and emergency interventions. Patients with common bile duct stones or dilatation, cholangitis, pancreatitis, significant liver function test (LFT) biochemical abnormality, and jaundice were excluded. Patients whose files that were not full filled with complete information which is needed for the study.

### 3- Data collection:

This study reviewed patients' medical records systemically and were divided into two groups:

- a) Group with hospital stay <24 hours.
- b) Group with hospital stay ≥24 hours.

Data was collected from the hospital files using questionnaire, which was organized to five distinct sections, and were heading indicating its content; as follows:

**1<sup>st</sup> Section (patient demographics):** name, age, sex, address, and telephone number.

**2<sup>nd</sup> Section (comorbidity variables):** hypertension (HTN), Diabetes Mellitus (DM), Ischemic Heart Disease (IHD), previous history of abdominal operation.

**3<sup>rd</sup> Section (Pre-operative variables):** information about, GB stones, sludge, pericholecystic fluid, GB wall thickening, common bile duct diameter obtained from USG scan reports, (**indication of surgery**) as symptomatic GB stone, chronic cholecystitis, others if viable.

**4<sup>th</sup> Section (operative variables)** will be classified as (findings and complications):

- **Findings** as acute inflammation, presence of adhesion, GBS, distended GB, empyema, mucocele, and other (polyp, gangrenous GB.)
- **Complications** as incidental perforation of GB, injury of bowel by trocar, bile duct injury and abdominal drain placement, and cases that required conversion to open.

**5<sup>th</sup> Section:** postoperative variables and outcome will be derived from postoperative charts, will include PONV, complications as postoperative hemorrhage

(clinical signs of active hemorrhage such as bloody output from drain), bile leak (directed by drain output), and length of stay (LOS) in hospital, and patient who readmitted.

#### **4- Ethics:**

Data collection and research procedures in this study weren't likely to cause any physical or emotional harm on the population under study. All data were kept private and used in the study only. Results were used only for scientific goals didn't appear as part of this project. This protocol was submitted to ethics committee by following the applicable protocol.

#### **5- Statistical analysis:**

Data were processed by SPSS 25 statistical program. Quantitative variables like age were presented by calculating means  $\pm$  SD. Qualitative variables like gender and LC findings were presented by calculating frequencies and percentages. The statistical significance of differences between categorical variables were calculated by the chi-square test. P-value of  $<0.05$  was considered as statistically significant.

#### **6- Result:**

During the period of the study, 209 patients underwent LC, out of which six

patients didn't fulfilled the inclusion criteria

Indications for surgery	N	(%)
Chronic cholecystitis	168	82.8
Acute cholecystitis	32	15.8
Gallbladder polyps	2	1.0
A calculous cholecystitis	1	0.5
<b>Total</b>	<b>203</b>	<b>100.0</b>

and two of them associated with hernia repair operation were excluded. Of the 203 patients, the median age was 38 (IQR, 20–50) years, the highest percentage 196 (96.6%) patients aged  $\leq 65$  years. Female 186 (91.6 %) and male 17 (8.4%) with female-to-male ratio of (11:1). 177 (87.2%) patients had no associated co-morbidities.

However, hypertension was found among 10 (4.9%) patients and DM were 8 (3.9%) patients that were the commonest associated medical conditions. The findings of USG, cholelithiasis were the most common findings in 172 (84.7%) patients, in addition to 27 (13.3%) patients; which accompanied GB wall thickening more than 3 mm that show presence of acute inflammation. Two (1.0%) patients with GB wall thickening more than 3 mm one (0.5%) patient associated with polyp and one (0.5%) patient with sludge, two (1.0%) patients of GB polypoid lesions.

[Table-1] Based on medical history and abdominal imaging tests, the most frequency were 168 (82.8%) patients were treated for symptomatic GBS /chronic cholecystitis.

**Table-1 Indications for cholecystectomy according medical history and abdominal imaging tests**

Intra-operative findings, GBS were the most finding in 199 (98.0%) patients, adhesions found in 44 (21.7%) patients, GB distension 49 (24.1%) patients. Mucoceles were found more than empyema, which were 14 vs 5 (6.4% vs 2.5%) patients, respectively.

[Table-2] Intraoperative complications were 6 (3%) patients; one (0.5%) patient had significant hemorrhage from cystic artery and difficulty to control it that needed to be converted to open procedure, two (1.0%) patients had stone and GB spillage during extraction lead to drain insertion and incidental perforation of GB had occurred in other 3 (1.5%) patients that drain insertion is needed to be done. Eight (3.9%) patients were converted to open surgery due to difficult procedures; as the presence of significant inflammation and adhesions compromising the surgical operative field in 3 (1.5%) patients, one (0.5%) patient due to difficulty to identify cystic duct, other patient with impaction of the stone in the

distal part of the cystic duct, and patient

Post-operative Complications	N	(%)
Bile leak	1	0.5
Pain	21	10.3
PONV	5	2.5
Other	4	2.0
<b>Total</b>	<b>31</b>	<b>15.3</b>

with thick wall of the GB and mucocele, and gangrenous GB in one (0.5%) patient, added to presence of adhesions in both.

**Table-2** Intraoperative complications among patients who underwent laparoscopic cholecystectomy

There was statistically significance of drain insertion among 25 (12.3%) patients who had drain; I noted nine (4.4%) patients were diagnosed as acute cholecystitis as acute characteristic has been found in USG GB wall thickening associated with GB stone) ( $P= 0.002$ ). In contrast, drain insertion was reported among 16 (7.9%) patients who had the chronic cholecystitis ( $P = 0.006$ ).

[Table-3] shows post-operative variables which may contribute for ONS, 21 patients complained of pain as noticed by administration of analgesic from drug list. Five patients experienced PONV as it documented at follow up note, one patient had bile leak from accessory duct that re-admitted in the second day post discharge,

other 4 (2.0%) patients have experienced different variables as hypoxia in one patient, dizziness in two patients, and asthma in one patient.

**Table-3** Post-operative among patients who underwent laparoscopic cholecystectomy

Re-admission rate was noticed with 3 (1.5%) patients, which were due to non-specific abdominal pain, sub-hepatic fluid collection which managed conservatively, and acute pancreatitis for each patient.

As all patients were admitted as inpatient, mean postoperative stay was ( $1.2 \pm 0.57$ ) days that was illustrated on [table-4]. Fifteen (7.4%) patients have been discharged on the same day of surgery without post-operative overnight admission. 23 (11.3%) patients of 32 (15.7%) patients who have done LC for cute cholecystitis were discharged within 24 hrs. with overnight stay and 2 (1.0%) patients were

Complications	N	(%)
Significant hemorrhage	1	0.5
Incidental perforation of GB	3	1.5
stone, GB spillage	2	1.0
<b>Total</b>	<b>6</b>	<b>3</b>
Converted to open	8	3.9

Percentages are calculated from total number of patients (n=203)

discharged at the same day according to

their desire, thirteen (6.4%) patient who had LC for chronic cholecystitis have been discharged at same day. The relation is not significant P-value (P=0.097) patients were

	LOS						Total		P-value
	Same-day discharge		ONE DAY		TWO DAYS				
	N	%	N	%	N	%	N	%	
Pain	0	0.0	15	6.9	3	2.0	18	8.9	0.156
PONV	0	0.0	3	1.5	1	0.5	4	2.0	0.128
Drain	0	0.0	12	5.9	9	4.4	22	10.3	0.000
Drain=Patient	0	0.0	2	1.0	1	0.5	3	1.5	0.44
Total	0	0.0	32	15.3	14	7.4	47	24.7	

Note: 1 day: discharged post one overnight stay  
2 day: discharged post two nights stay

admitted for two nights. The relation is not significant P-value (P=0.083).

Table- 4 Length of stay post laparoscopic cholecystectomy

As the operation have not been planned as day case surgery, and a large different between the frequency between the two groups; so, it would be bias, and we couldn't identify wither the residence of the patients is a factor for overnight stay or not.

Table-5 Length of stay post laparoscopic cholecystectomy in association with post-operative variables

## 7- Discussion:

Outpatient cholecystectomy was first reported by Reddick and Olsen in 1990.<sup>10,11</sup> Day-case surgery in Great Britain and

Ireland is defined as 'the patient is admitted and discharged on the same day, with day surgery as the intended management. This is different from the term '23- hour stay' used in the United States. Overnight stays are classed as inpatient stays in the UK.<sup>12-14</sup>

Length of stay	N	%
<24 hr.	15	7.4
24 hr.	167	82.3
2 days	21	10.3
Total	203	100
Mean post-operative stay	1.2 ± 0.57 days.	
Re-admissions	3	1.5

Note: 24 hr. (one-night stay), 2 Days (two-night's stay).

All patients in this study have done LC as inpatient, however mean postoperative stay is (1.2 ± 0.57) days, 7.4% of patients have been discharged by their preference at the same day without overnight stay, 82.8% have been discharged within 24 h with overnight stay. This result is slightly lesser than reported by other study, Mean postoperative stay was 1.8 ± 3.5 days, more than 78% of patients have been discharged within 24 hrs. from the operations and 22.3% have been discharged on the same day, usually 3–4 h after the end of the operation by Tebala et al.<sup>8</sup> in Italy 2017, as concluded by Seyednejad, Goecke, and Konkin in 2016 that 4 hrs. postoperative observation time is sufficient for recognizing patients who require unplanned admissions.<sup>15</sup>

PONV is very unpleasant, and an exhausting problem for patients following LC, it could prolongs recovery time, delays patients' discharge usually be admitted to the hospital for observation and comfort leading to increased hospital cost.<sup>16-18</sup> This study shows of 203 patient only five (2.5%) patients had mild PONV during the postoperative overnight stay, equal in number to other study, five (13%) patients had an overnight admission by Franco<sup>19</sup> 2007, and six patients required admission as result of PONV by Lau and Brooks<sup>11</sup> 2001, study results in Kuala Lumpur, Malaysia 2015 have displayed Five patients complained of PONV in daycare group compared to tow patients in the overnight stay group<sup>17</sup> Postoperative pain and PONV were two practical issues awaiting further improvement to facilitate ambulatory LC.<sup>20</sup>

Control of pain was considered in the day case guideline.<sup>14</sup> By Franco residual pain was in nine (24%) patients in<sup>19</sup> Paris 2007, this study shows 21 (10.4%) patients complained of pain mostly at mid night, as they required added analgesic to the prescribed dose. Moreover; drain is one of overnight stay cause, when used, it reflects difficulty of the operation, it is useful only if left for several hours and this prevents patients from being discharged on the same

day without overnight stay,<sup>8</sup> in this study it is inserted in 25 (12.3%) patients; (6.9%) patients were discharged post one overnight stay, (5.4%) patients discharged post two overnight stay, with indication according to intraoperative finding, adhesions demonstrate the most percentage (4.9%), it is reasonable to postulate that the more difficult the dissection, the longer the duration of surgery and the higher the risk of complications, by Hakeem et al. 24.5% of patients in the group of unexpected overnight admission had drain inserted<sup>21</sup> in UK.

Important outcome measurement in the day surgery situation are the hospital return and readmission rates, It has been suggested that an acceptable readmission rate should be between (1%-2%) and if return or readmission occurs in the first 24 hours there is a need to be analyzed as it would be emergent.<sup>22</sup> The redamation rate in this study is 1.5% it was post 24 hours of discharge. By Lilimoe et al. (4.6%)<sup>23</sup> in USA, (3.4%) by Bal et al.<sup>24</sup> in New Delhi 2003, Redamation frequency reflect whether the patient have met the condition which considered by day case surgery guide line so they don't need to back to the hospital.

My investigation is limited to some degree by its retrospective design and, BMI has not been considered within the prognostic factors in the present study. The presence or absence of comorbidities did not happen to be an independent prognostic factor for overnight stay, as they are medically controlled no complain associated to their comorbidity and most of their postoperative period passed smoothly

Just 15(7.4%) patients who discharged at the same day according to their preference. In conclusion the remaining 149(71.8%) patients have been stayed overnight without noticeable cause so, this study provides that majority of patients undergoing elective LC can be discharged home the day of surgery without overnight stay.

### 8-Recommendation:

Protocol should be done at Taiz hospitals to start with safe day case surgery, day care units should be made in hospital that could facilitate the procedure and make it ordinary to medical staff in hospitals, and to facilitate prospective study of day case

surgery therefor Patient should be educated about the same-day discharge. Same-day discharge should be considered if no drain was left at the end of the operation, and the patient free of post-operative symptoms. Team working should be coordinated on enhanced recovery after surgery (ERAS) protocols for successful outcome. The anesthetist should review the patient and plan the most appropriate anesthetic technique to facilitate surgery and same day discharge. We should include patient's preference in the future studies in our society.

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