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Laparoscopic Cholecystectomy in Day Surgery: Feasibility and Outcomes in Taiz-Yemen

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Abstract

Background: *Major surgery performed as a day surgery procedure is not uncommon. This study aims to evaluate the feasibility of day surgery procedures in laparoscopic cholecystectomy (LC) in Taiz Yemen.*

Methods*: Between January 2017 to May 2020, in our hospital, 203 patients were selected for day surgery LC. The indication for surgery was symptomatic cholelithiasis confirmed by ultrasonography. All patients were informed about the same-day discharge policy and received the postoperative instruction form on discharge. Retrospective review of Preoperative work-up included history taking and physical examination in addition to standard laboratory and radiological tests. Operative time, hospital stay, and complications were recorded.*

***Result**: 203 laparoscopic cholecystectomies were performed, the median age was 38 (IQR, 20–50) years, the mean postoperative stay was 1.2 ± 0.57 days. Fifteen (7.4%) patients were discharged home on the same day. Three (1.5%) patients were readmitted; 149 (71.8%) patients might be discharged home on the same day.*

***Conclusion:** laparoscopic cholecystectomies may be done as a day surgery procedure with optimal patient satisfaction and without complications.*

***Keywords:** Cholecystectomy, day surgery, laparoscopic, Taiz Yemen.*

Introduction

The gallbladder (GB) disease has undergone major changes in its surgical management during the last three decades. **(**1,2**)** Starting from open cholecystectomy, which in 1882 the first cholecystectomy is performed. **(**3,4**)** 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. **(**5**)** Based on the initial experiences of the surgeons with laparoscopic cholecystectomy (LC), they have become increasingly confident of discharging patients of all ages early, which saves considerable monetary and human resources. **(**6**)**

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.6 Although there is a lack of data associated with daycare laparoscopic cholecystectomy (DCLC) from developing countries, **(**7,8**)** 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. **(**7**)**

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%).**(**9**)**

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

Method and patients

This study is a retrospective, cross-section descriptive, hospital-based study. The sample size of the study was consisting of all patients 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 were not fully filled with complete information which is needed for the study.

Data collection:

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

a) Group with hospital stay> 24 hours.

b) Group with hospital stay≤ 24 hours.

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

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

2nd Section (**comorbidity variables**): hypertension (HTN), diabetes mellitus (DM), ischemic heart disease (IHD). previous history of abdominal operation.

3rd Section (**Pre-operative variables**): information about, gallbladder stones(GBS), 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.

4th 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 the bowel by trocar, bile duct injury and abdominal drain placement, and cases that required conversion to open.

5th Section: postoperative variables and outcomes will be derived from postoperative charts, will include post-operative nausea and vomiting (PONV), complications as postoperative hemorrhage (clinical signs

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

Ethics:

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

Statistical analysis:

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

Result

During the period of the study, 209 patients underwent LC, out of which six patients didn't fulfill the inclusion criteria 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 ≤ 65 years. Female 186 (91.6 %) and male17 (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 the 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, the most frequency was 168 (82.8%) patients were treated for symptomatic GBS /chronic cholecystitis.

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

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
Total	**203**	**100.0**

[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 compromised the surgical operative field in 3 (1.5%) patients, one (0.5%) patient due to difficulty to identifying cystic duct, other patients with impaction of the stone in the distal part of the cystic duct, and patient with a thick wall of the GB and mucocele, and gangrenous GB in one (0.5%) patient, added to the presence of adhesions in both.

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

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

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

[Table-3] shows post-operative variables which may contribute to Overnight stay (ONS), 21 patients complained of pain as noticed by administration of analgesic from drug list. Five patients experienced PONV as documented at follow up note, one patient had a bile leak from the accessory duct that was 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

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

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

As all patients were admitted as inpatients, the mean postoperative stay was (1.2 ± 0.57) days that was illustrated in [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 acute cholecystitis were discharged within 24 hrs. with overnight stay and 2 (1.0%) patients were discharged on the same day according to their desire, thirteen (6.4%) patients who had LC for chronic cholecystitis have been discharged on the same day.

The relation is not significant P-value (P=0.097) patients were admitted for two nights. The relation is not significant P-value (P=0.083).

Table- 4 Length of stay post laparoscopic cholecystectomy

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).

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The relation is not significant P-value (P=0.097) patients were admitted for two nights. The relation is not significant P-value (P=0.083).

A drain had a relation with the length of stay (LOS) it was the most cause of inpatient, of 25 (12.3%) patients who had a drain, 11 (5.4%) patients had been admitted for two days, 14 (6.9%) patients had been admitted for one day (one-night stay). This is significant statistically ($P = 0.000$).

As the operation has not been planned as day case surgery, and a large difference in the frequency between the two groups; so, it would be biased, and we couldn't identify whether the residence of the patients is a factor for an overnight stay or not.

Discussion:

Outpatient cholecystectomy was first reported by Reddick and Olsen in 1990.**(**10,11**)** 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. **(**12–14**)**

All patients in this study have done LC as an inpatient, however, the mean postoperative stay is (1.2 ± 0.57) days,7.4% of patients have been discharged by their preference on the same day without an overnight stay, 82.8% have been discharged within 24 h with an overnight stay. This result is slightly lesser than reported by other studies, 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.8in 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. **(**15**)**

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

	LOS								
	Same-day discharge		ONE DAY		TWO DAYS		Total		P-value
	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=Pain	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

PONV is very unpleasant, and an exhausting problem for patients following LC, it could prolong recovery time, delays patients' discharge usually being admitted to the hospital for observation and comfort leading to increased hospital costs.**(**16–18**)** This study shows of 203 patients only five (2.5%) patients had mild PONV during the postoperative overnight stay, equal in number to another study, five (13%) patients had an overnight admission by Franco **(**19**)** 2007, and six patients required admission as a result of PONV by Lau and Brooks **(**11**)** 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 **(**17**)** Postoperative pain and PONV were two practical issues awaiting further improvement to facilitate ambulatory LC.**(**20**)**

Control of pain was considered in the day case guideline.**(**14**)** By Franco residual pain was in nine (24%) patients in **(**19**)** Paris 2007, this study shows 21 (10.4%) patients complained of pain mostly at midnight, as they required added analgesic to the prescribed dose. Moreover; drain is one of overnight stay cause when used, it reflects the 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 an overnight stay, **(**8**)** 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 a drain inserted **(**21**)** in the UK.

Important outcome measurements 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.**(**22**)** The redemption rate in this study is 1.5% it was post 24 hours of discharge. By Lilimoe et al. (4.6%) **(**23**)** in the USA, (3.4%) by Bal et al. **(**24**)** in New Delhi 2003, Redemption frequency reflects whether the patient has met the condition which considered by day case surgery guideline 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 an overnight stay, as they are medically controlled no complaint associated with their comorbidity and most of their postoperative period passed smoothly

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

Conclusions:

Protocol for DCLC and day care units could be done at Taiz hospitals to start with safe day case surgery that would facilitate the procedure, make it ordinary to medical staff in hospitals, and facilitate the prospective study of day case surgery therefore Patients 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 is free of post-operative symptoms. patient’s preference should be considered in future studies in our society.

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