Day Surgery Laparoscopic Cholecystectomy: Evaluation of the Clinical Outcomes and Patient Satisfaction in a Guatemalan Day Surgery Centre

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Abstract

The present study aims to evaluate the feasibility of day-surgery laparoscopic cholecystectomy, in terms of patient satisfaction, pain management, nausea and vomiting in the postoperative period and after discharge. A total of 150 consecutive patients with ascertained cholelithiasis who underwent laparoscopic cholecystectomy were enrolled in the study. The results of the study suggest that laparoscopic cholecystectomy in day-surgery can be effectively and safely performed, achieving high rates of patients' satisfaction; this might have a positive impact on reducing waiting times, patient turnover and health care costs. Further, well-designed studies on large cohorts are necessary to confirm our findings.

Keywords: Gallbladder, Cholelithiasis, cholecystectomy, day-surgery, laparoscopy.

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Introduction

Gallbladder lithiasis affects approximately 10–15% of the general adult population in Western countries [1–5]. Each year, 1-4% of the sufferers become symptomatic as they develop acute cholecystitis due to the obstruction of the bile ducts [2, 5]. The gold standard in the management of symptomatic cholelithiasis is the surgical removal of the gallbladder, better known as "cholecystectomy".

The first open cholecystectomy was performed in 1882 by Langenbach and it took more than 100 years for Mühe (1985) to perform the first laparoscopic cholecystectomy (LC); Mühe had performed 94 procedures by 1987 when Mouret performed his first one in France [6, 7]. Today, this procedure is one of the most common surgical operations worldwide and its introduction represents a monumental scientific achievement, such as the discovery of anesthesia, asepsis, antibiotics and extracorporeal circulation [8]. The great diffusion of the technique and the technical improvements made over time, together with the progress in the patient's perioperative management, have meant that today it can also be performed in a day-surgery regimen.

Day surgery was born in Glasgow thanks to James Nicoll who described 9000 "day case procedures" in 1909 [9]. He was prompted by the limited availability of beds and the need to reduce the rate of in-hospital infections. Today, there is still some confusion around the term day-surgery in the scientific literature. The IAAS (International Association for Ambulatory Surgery) which includes 22 national societies, considers the term day-surgery as a synonym of ambulatory surgery and same-day surgery. These terms refer to those surgical procedures that can be performed in equipped institutions allowing patients to be discharged during the same working day.

The "Day Surgery: an overview" report, published in France in 2012, provides a valid framework on the spread of day-surgery practice at a global level [10]. According to this report, 80% of surgical procedures could be treated in day-surgery. Laparoscopic cholecystectomy is one of them, as it is now mainly performed in day-surgery in various countries all over the world, such as Norway, Denmark, the United States and others [10-14]. Nevertheless, in other countries, LC in day-surgery is seen with mistrust, mainly because of the possibility of post-surgical complications harming the patient and, as a consequence, the doctor. For this reason, scientific research is warranted to validate this treatment method.

The present prospective study performed in 150 patients aims to evaluate the feasibility of day-surgery LC, in terms of patient satisfaction, pain management, nausea and vomiting in the postoperative period and after discharge.

Methods

From March to June 2017, a total of 167 consecutive patients with ascertained cholelithiasis and candidates for LC were enrolled in the study, at the Roosevelt Hospital in Guatemala City. The exclusion criteria were: prolonged hospital stay due to additional intraoperative complications (bile duct choledocholithiasis or conversion to open cholecystectomy) and errors of data recollecting in the questionnaire.

All patients were hospitalized at 7 am on the day of the planned surgery. As a prerequisite, all patients were asked to fast from midnight and be accompanied by someone who could assist them the first hours after surgery. Preoperative anesthesia evaluation was performed the day before surgery; only ASA 1, 2 and 3 patients (if physiologically compensated) were admitted for LC. No preoperative anti-thrombotic neither antibiotic prophylaxis were prescribed. All interventions were performed under general anesthesia, with intubation and controlled ventilation. Propofol was used for induction, Atracurium besylate for muscle relaxation, Fentanyl as analgesic and Desflurane or Isoflurane for the maintenance of anesthesia during surgery. Infiltrations with 0.5% Levobupivacaine were performed in the trocar positioning sites before incisions. Dexketoprofen 50 mg (or Metamizole 1g), and Dimenhydrinate 50mg intravenously were administered before the end of the procedure to prevent postoperative morbidity (pain, nausea, and vomiting).

Surgeries started generally at 7.30-11.30 in the morning. All the LCs were performed with the "American" technique, consisting in umbilical trocar positioning with the Hasson technique, induction of the pneumoperitoneum with carbon dioxide up to 12–15 mmHg, and the positioning of other three trocars in the subxiphoid and right subcostal region (middle clavicular line and anterior axillary line respectively) with laparoscopic vision. The patients were placed in anti-Trendelenburg position and on their left side. Surgeons performed the procedure according to the Strasberg technique (Figure 1) (near here) [15]. The gallbladder was removed via the subxiphoid incision (a bag was used only in case of perforation or fragility of the specimen).

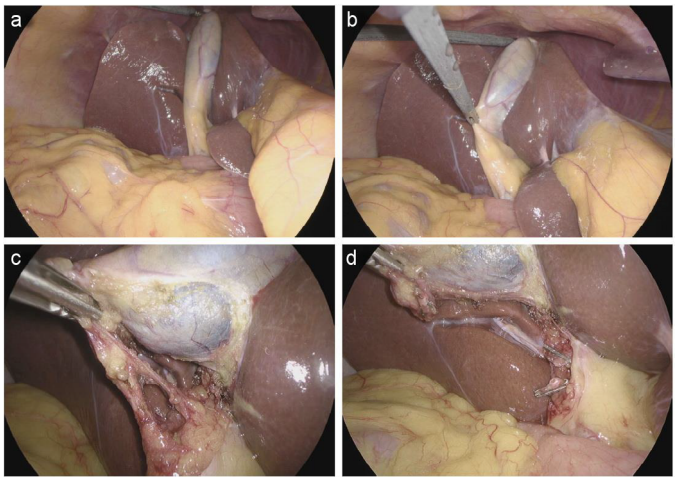

Figure 1 Laparoscopic cholecystectomy according to the Strasberg technique.
a) Cephalad traction of the fundus and exposure of the gallbladder fossa;
b) Lateral traction of the infundibulum and exposure of the gallbladder hilum;
c) Complete incision of the serosa in the medial aspect of the infundibulum;
d) Section of the cystic duct and cystic artery between metal clips.

After the postoperative recovery, the patients were transferred to a short hospitalization area and early mobilized with the assistance of a family member before discharge. All patients were prescribed oral home therapy with Dexketoprofen 25 mg every 8 hours for 3–5 days, and Dimenhydrinate 50 mg only in case of nausea and vomiting. In some cases, oral antibiotic therapy was also prescribed.

One week after surgery, during the outpatient check-up visit, the patients were invited to answer a questionnaire concerning: a) intensity of pain. The test was performed showing the patient a numerical/visual scale (NRS/Wong-Baker FACES® Pain Rating Scale), going from 0 to 10 (0 corresponds to the absence of pain and 10 to maximum pain); b) nausea and vomiting; c) degree of patient satisfaction. They were asked to express an overall judgment of the medical assistance received (using a scale from 1 to 10) and an evaluation(excellent/good/sufficient/poor) about clarity of information received respect the home's conduct instructions.

All patients signed informed consent for surgery and for the use of their clinical data for scientific research purposes. The study was carried out in accordance with the Helsinki declaration.

Results

Among the 167 patients enrolled had been selected 150 patients respecting the exclusion criteria: there were 16 males and 134 females (11% and 89%, respectively). The mean age was 41 (18–80) years old on average). The mean duration of general anesthesia was 1 hour and 21 minutes while the average observation time before discharge was 2 hours and 43 minutes. In 67 cases (44%) oral antibiotic therapy was prescribed at the discretion of the surgeon. In 10 patients (7%) drainage tubes were placed; the tubes were removed in all cases on the second postoperative day. In 4 cases (2.7%) surgical site infection eradicated with oral antibiotics was reported (Supplementary Table 1).

The average pain at the time of discharge was 2.6 against 3.5 reported in the evening after the operation (Table 1). Ninety-two patients (61.3%) reported good management of their symptoms with Desketoprofen; 31 (21%) reported pain greater than 6 just the evening after surgery, and 9 (6%) failed to adequately manage it with the prescribed analgesics. Among the surgical incisions discomfort or pain was caused mainly by the subxiphoid access (42%) followed by the umbilical and the subcostal ones (34% and 19%, respectively). In 12% of cases the pain was reported as widespread in the abdomen area and not localized in one of the specific trocar sites.

Globally 54% of the patients had neither nausea nor vomiting, 23% only nausea and the remaining 23% nausea and vomiting combined (Table 2). Among the symptomatic patients 54% did not consider it necessary to take dimenhydrinate given the mildness and short duration of symptoms, a further 30% of them controlled the symptoms with the drug while the remaining 16% (11 patients) failed to control nausea or/and vomiting. The evening after the intervention 64% of the patients reported being able to eat light food, 33% having only liquids and the remaining 3% having ingested neither liquids nor solids till the day after.

The mean evaluation score of the medical assistance received was 9.7 out of 10 (Table 3). The medical information received was evaluated as excellent by 68% of the patients, good, sufficient and poor by 27%, 3% and 2% of them, respectively. The observation time before discharge was judged as satisfactory by 66% of the patients, 34% of them would have preferred to stay a few hours longer and 14% (21 cases) would have remained hospitalized for one more day.

Discussion

Although laparoscopy allows a faster postoperative recovery, pain management after cholecystectomy is still a major problem in the scientific literature [16]. The patients included in our study achieved overall a good pain control at home. However, in 9 cases (6%), the

Table 1 Evaluation of postoperative pain in our cohort.

VAS scale	0	1	2	3	4	5	6	7	8	9	10
Pain intensity at discharge	72 48.0%	4 2.7%	8 5.3%	12 8.0%	11 7.3%	12 8.0%	7 4.7%	12 8.0%	6 4.0%	2 1.3%	4 2.7%
Pain the evening after discharge	40 26.7%	20 13.3%	9 6.0%	8 5.3%	18 12.0%	8 5.3%	16 10.7%	12 8.0%	7 4.7%	6 4.0%	6 4.0%
Pain control with desketo-profen at home	*Yes* 138 92%	*No* 12 8%	**Pain site**	*Umbilical* 44 29%		*Subxiphoid* 55 37%		*Subcostal* 25 17%		*Diffused* 16 11%	

Table 2 Evaluation of nausea and vomiting in our cohort.

Symptoms	Anything 54%	Nausea 23%	Nausea and vomiting 23%
Dimenidrinate controlling efficacy	Unnecessary 25%	Controlled 14%	Not controlled 7%
Diet	Neither liquids nor solids 3%	Only liquids 33%	Light food diet 64%

Table 3 Evaluation of patient expectations in our cohort.

Patients who would preferred to stay hospitalized:		**Yes**			**No**
More time		34%			66%
One more day		14%			86%
Global evaluation	1-6	7	8	9	10
	0	3	6	27	114
	0%	2%	4%	18%	76%
Information evaluation		Poor	Sufficient	Good	Excellent
		2%	3%	27%	68%

pain was not adequately controlled with the prescribed medication. The reason might be a decrease in Desketoprofen effectiveness in these patients. This suggests that the prescription of an alternative drug or an association of drugs may be necessary in some cases. Interestingly the overall satisfaction of these 9 patients was 10/10 and only one of them would have preferred to be discharged the day after the operation. This may be due to the fact that visual pain scales are somehow subjective and influenced by the patient's personal sensitivity threshold.

The subxiphoid incision was found to be one of the most frequent sites of discomfort and pain; this can be caused by surgical manipulation and dilation of the access during gallbladder extraction. A randomized study conducted in Pakistan in 2012 compared 60 patients in whom the gallbladder was extracted through the umbilical access and 60 patients in whom the epigastric access was used. The pain was significantly milder in the case of umbilical extraction ($p<0.001$) and this site was recommended by the authors for specimen extraction [17].

With regard to postoperative nausea and vomiting 46% of the patients were found to be symptomatic after getting home: half of them had only nausea, while the other half had both nausea and vomiting. However, 54% of the symptomatic patients did not consider necessary any drug, 30% managed the symptoms with Dimenhydrinate and only in the remaining 16% (11 cases) the drug didn't controlled the symptoms.

Nausea and vomiting after general anesthesia and, specifically, after laparoscopic cholecystectomy, is a hot topic in the surgical literature. Recent studies have shown encouraging results with preoperative prophylactic administration of Ondansetron or Metoclopramide and intraoperative administration of Cyclizine and Dexamethasone [18]. In our practice, Dimenhydrinate is indicated as an antiemetic to be taken when necessary because it is cheap and it fits better the average purchasing capacity of the Guatemalan population.

The economic aspects regarding the prevention and treatment of postoperative pain, nausea and vomiting have been evaluated in a recent Dutch study [19]. Questionnaires were administered in the pre- and post-operative phase to 808 patients who underwent operations under general anesthesia. These questionnaires assessed the money they would have been willing to spend to completely avoid pain, nausea and postoperative vomiting. After surgery, the patients assessed they would have spent more money to avoid the pain, while there was no difference in what they said about nausea and vomiting [19].

In our study the overall satisfaction of the 11 patients who suffered nausea and vomiting despite Dimenhydrinate, was similar to that of the remaining cohort (9.6 and 9.7 respectively). This finding, together with the results of the Dutch study, suggests that nausea and vomiting are symptoms that do not generate excessive postoperative concern in patients.

Adequate pre and postoperative information are essential to ensure that the patient conscientiously and safely accepts day-surgery. The patients in our study were instructed on how to behave at home after discharge through verbal communication (in presence of an accompanying person) and through a written memorandum. In 98% of the cases this approach was considered to be enough, good or excellent and the mean overall satisfaction rate was 9.7/10.

Regarding the in-hospital duration of the post-operative recovery, 14% of the patients claimed that they would have preferred to remain hospitalized and be discharged the day after (one-day surgery). The results concerning the presence of nausea and vomiting, pain at the time of discharge, the average time of observation and anesthesia, and the satisfaction rate were re-examined in these patients.

Some parameters (vomiting and pain mainly) were found to be a bit higher than the average results coming from the entire cohort, but the differences were not significant. At a final verbal survey some of these

patients explained that their preference for one-day hospitalization was linked to the fact that they would feel "safer" in the hospital. Probably, the propensity towards an overnight hospital stay is to be attributed mostly to psychological factors, than to real complications.

Our study has some limitations, like the small number of patients included and the restricted types of drugs used for pain, nausea and vomiting control. Nevertheless, the standardized scheme and surgical procedure, the accurate follow-up and the use of validated scales to assess some of the outcomes are some of the advantages of our approach.

In conclusion, our data suggest that LC in day-surgery can be effectively and safely performed, achieving high rates of patients' satisfaction; this might have a positive impact on reducing waiting times, patient turnover and health care costs. Further, well-designed studies on large cohorts are necessary to confirm our findings.

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