

Bowel movement changes after laparoscopic cholecystectomy

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Abstract

Background & objectives: Laparoscopic Cholecystectomy is the first choice of therapy in patients with symptomatic gallstone disease. This technique has been dramatically effective in decreasing the need for open cholecystectomy and its complications. However, not all patients are free from complications following cholecystectomy. This study was aimed at evaluating the prevalence of changes in bowel movement in patients undergoing laparoscopic cholecystectomy in a sample population in Erbil city.

Methods: In this prospective clinical trial, 221 patients diagnosed with gallstone disease attended Rizgary Teaching hospital. The patients were screened clinically and by investigations for the eligibility criteria between November 1st, 2018, and October 31st, 2019. Out of these; 172 were included underwent laparoscopic cholecystectomy under general anesthesia. The patients were given appointment for follow up postoperatively at two weeks and three months for the bowel movement changes, such as diarrhea, constipation, and other complications.

Results: The mean and range of age and body mass index of the patients were 40.77 (15-92 years) and 27.07 (17.92-45.20), respectively. Majority of the patients were females (82.6%), and the remaining were males (17.4%). The study revealed that 93.0% and 93.6% of the patients had no changes in their bowel movement upon follow-up for two weeks and three months postoperatively, respectively. The study found no significant differences in the diarrhea rate in patients with different body mass indices at three weeks and three months. The rate at which diarrhea occurred was significantly higher in younger aged patients at three-month follow-up (32.00 vs. 40.83 years).

Conclusions: The current study showed a low rate of bowel movement changes in patients who underwent LC at two weeks and three months postoperatively.

Key words: Bowel motion: Laparoscopic cholecystectomy; Gall stones.

Introduction

Cholecystectomy for the treatment of gallbladder disease has become the most common abdominal operation in westernized countries. Carl Langenbuch is credited with performing the first open cholecystectomy in 1882.

Laparoscopic Cholecystectomy (LC) is the first treatment option in patients suffering from symptomatic gallstone disease. This technique was introduced by Mühe in 1985.¹ This technique has now surpassed the open approach as the “gold standard”

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operation, as it was significantly successful in minimizing the need for open cholecystectomy and its complications.² Laparoscopic cholecystectomy technique has become the standard management therapy for patients with symptomatic cholelithiasis and cholecystitis with different severities.³ The advantages of LC include a decrease in morbidity, hospital stay and costs, and a reduction in the rate of conversion to open surgery.⁴ Laparoscopic cholecystectomy itself continues to advance; indications are also broadening, as evidenced by the dramatic increase in the number of procedures performed for acalculous disease. However, not all patients are free from complications following cholecystectomy. About one-third of the patients are reported to experience abdominal pain, flatulence, or dyspepsia following LC surgery, so-called postcholecystectomy syndrome.⁶ According to WHO criteria; diarrhea is the passage of 3 or more loose or liquid stools per day. Postcholecystectomy diarrhea (PCD) is considered to be the second most common complaint after pain following LC with an incidence rate of 9.1%.⁷ Diarrhea in many patients who underwent LC is

multifactorial. Evidence about the important factors in PCD have so far been controversial, it may be associated with malabsorption of bile acid. However, shortening of the gut transit time by accelerating passage through the colon may lead to PCD. Postcholecystectomy diarrhea may also be due to increased amounts of bile acid presented to the large bowel. A low-fat diet in the immediate postcholecystectomy period does seem to have a preventive effect against PCD.¹⁶ Gastrointestinal symptoms which happen after cholecystectomy are usually unspecific and mild, such as flatulence, nausea, eructation, indigestion, and changes in bowel habits.⁸⁻⁹ Diarrhea is the most common change in bowel habits after LC. The most distressing sequelae following LC is diarrhea with the prevalence ranging from 0.9 to 35.6%.⁷⁻¹⁰ Currently, the reports about the prevalence rate of bowel motion in Iraqi patients underwent LC are a few.¹¹⁻¹² The purpose of this study was to assess and determine the prevalence of bowel movement changes in patients undergoing laparoscopic cholecystectomy in a sample population in Erbil city.

Patients and methods

In this cross-sectional observational study, total 221 patients were diagnosed with gallstone disease, the patients who attended the out-patient clinic of general surgery in Rizgary Teaching Hospital in Erbil city were screened clinically and by investigations for the eligibility criteria, 36 of them were excluded due to the exclusion criteria, and 13 patients were not followed-up, since they did not attend the clinic after surgery or were not reached by phone call. The remaining 172 patients were underwent LC under general anesthesia during November 1st, 2018, and October 31st, 2019 (12 months period). The patients who presented with medical signs and symptoms of the disease were included.

Experienced senior specialist surgeon in the hospital performed the procedure. The patients were followed-up for two weeks and three months for the bowel movement changes. The following inclusion criteria were applied to the patients: the patients aged 15 years and older of both genders irrespective of socio-demographic aspects were included in this study. The included patients had previous history of right hypochondrial pain/ biliary colic, previous attacks of cholecystitis, gallstone pancreatitis, empyema and gallbladder polyp. The patients with the following conditions were excluded from the study: acute cholecystitis, inflammatory bowel disease, diabetes mellitus, history of

abdominal surgery, pregnancy, history of radiation to the abdominal region, known case of irritable bowel syndrome, and those taking medications like antibiotics, laxatives, lipid-lowering agents, cholestyramine. When there is clinical suspicion of gallstones, abdominal ultrasonography is the imaging of choice. The accuracy to detect gallbladder stone using ultrasound exceeds 95%¹³. The LC was performed under general anesthesia using standard four-port technique. The ports included: a 10 mm port for the infra-umbilical camera, inserted directly by using the open technique and insufflating with CO₂. The three other ports were performed and were monitored under the direct view of the camera¹⁴. The authors requested the patients to attend the hospital after two weeks and three months for a follow-up process. The patients underwent physical and clinical examinations to document complications. The bowel movements, including diarrhea and constipation, were obtained through the self-reported technique and recorded in a pre-designed

questionnaire. The descriptive characteristics of the patients were presented in mean and standard deviation or number and percentage. The prevalence rate of bowel motions was determined in number and percentage. The Fishers' exact test was used to examine the difference in the prevalence of diarrhea in patients with different body mass indices. In addition, the independent t-test was performed to examine the age difference between patients with and without diarrhea outcome at both two weeks and three months of follow-up. The statistical calculations were performed by Statistical Package for Social Sciences version 25 (IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.), p-value of ≤ 0.05 was considered significant. The ethical approval of the present study was taken from the Kurdistan Higher council of Medical Specialties (KHCMS). The confidentiality of the personal information of the patients was protected throughout the study step according to the instructions of the health ethical committee

Results

The mean age of the patients was 40.77 standard deviation (SD: 13.80) ranged between 15 and 92 years. The mean of patients' BMI was 27.07 (SD: 4.06) ranged between 17.92 and 45.20. The patients were overweight (45.3%), normal weight

(27.9%), obese (26.2%) and only one case were underweight (0.6%). The patients were mostly females (82.6%), and remaining were males (17.4%), as presented in Table (1).

Table (1): General characteristics of patients

Patients' characteristics (n=172)	Statistics	
	Mean	SD
Age (Range: 15-92 yrs.)	40.77	13.80
BMI (Range: 17.92-45.20)	27.07	4.06
Underweight	1	0.6
Normal weight	48	27.9
Overweight	78	45.3
Obese	45	26.2
	No.	%
Gender		
Male	30	17.4
Female	142	82.6

The study showed that 93.0% and 93.6% of the patients had no changes in bowel movements two weeks and three months postoperatively, respectively. Table (2).

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(Table 2): Outcomes of bowel motions of patients

Follow-up (n=172)	Statistics	
	No.	%
Two weeks postoperatively		
Normal	160	93.0
Diarrhea	12	7.00
Three months postoperatively		
Normal	161	93.6
Diarrhea	11	6.40

The study did not find a significant difference in the prevalence of diarrhea in patients with different BMIs either at two weeks ($P=0.349$) and three months ($P=1.000$) of follow-up. Table (3).

Table (3): Association of LC outcomes with BMI

Postoperative time	BMI Categories				p-value
	Underweight	Normal	Overweight	Obese	
Two weeks					0.349
Normal	1 (100)	47 (97.9)	71 (91.0)	41 (91.1)	
Diarrhea	0 (0.0)	1 (2.1)	7 (9.0)	4 (8.9)	
Three months					1.000
Normal	1 (100)	45 (93.8)	73 (93.6)	42 (93.3)	
Diarrhea	0 (0.0)	3 (6.3)	5 (6.4)	3 (6.7)	

Fishers' exact test was performed for statistical analyses.

The study showed that the patients who developed diarrhea at three-month follow-up were more likely to be younger compared to those patients without diarrhea

(32.00 vs. 40.83 years; p -value=0.009) while this difference was not found at two weeks' follow-up (p -value=0.511), as presented in Table (4).

Table (4): Comparison of age between patients with and without outcome at two weeks and three months of follow-up

	Two weeks of follow-up		p-value
	Normal	Diarrhea	
Age	40.95 (13.92)	38.42 (12.40)	0.511
Three months of follow-up			
Age	40.83 (13.29)	32.00 (8.31)	0.009

An independent t-test was performed for statistical analyses.

Discussion

The current study showed a low rate of bowel movements in patients who underwent LC two weeks and three months postoperatively. The prevalence of PCD is highly different from one study to another one ranging between 0.9% to 35.6%.¹⁰ In the current study, the incidence of bowel motion change was 7.0% and 6.40% at two weeks and three-months follow-up. Del Grande.⁸ explored the prevalence and predictor of changes in bowel habits following LC. The overall prevalence of changes in bowel habits was 35.1% with a significant association with gastrointestinal symptoms. The patients without gastrointestinal symptoms had 2.34 times the odds of not presenting with change. Jasim.¹¹ evaluated the change in bowel motions in patients who underwent LC, including the prevalence, etiology, and possible risk factors of PCD. He recruited 140 patients for elective LC and followed-up the patients for two weeks, three months and six months. He classified bowel motion into hard, well-formed, loose, and watery. He also reported that 38.59% developed PCD during the study period. The mean number of bowel motion was increased from 1.1 before surgery to 1.9 at two weeks and three-months follow-up. The hard stool consistency was decreased from 35.1% before the operation to 8.8% for the follow-up period. A similar decrease was found for loose bowel motion from 17.5% to 29.8% within two weeks follow-up, Musa.¹² reviewed the complications of 242 patients who underwent elective LC in a retrospective way. He reported that six patients had immediate bleeding, two cases with post-cholangitis due to passed stone, two patients had late port site hernia, and one case with sub-hepatic collection (abscess). In addition, three cases developed port site infection. Also, three patients converted to open surgery (1.24%).

However, the author did not report any case of bowel motion change. Arif.¹⁵ compared the outcomes of miniport and standard LC and their intraoperative complication. He included 65 age and gender-matched patients randomly in each group. He did not report any case of bowel motion change among patients in both study groups. The reported complications were bile spillage, bleeding from gallbladder bed, wound infection, and bile duct injury. The variation in the prevalence of diarrhea as complication of LC may back to the design of the studies since many of these complications have been reported retrospectively.⁸ due to recall bias of outcomes in patients. Besides, the patients may have a different understanding of diarrhea owing to the difficulty of defining PCD. The prevalence of diarrhea in the present study was low at two weeks and was decreased at three months. We found that the patients who developed diarrhea at a three-month follow-up were more likely to be younger compared to those patients without diarrhea. Some other studies have found a similar pattern.¹⁰⁻¹⁶ They found a significant association between the younger age group <50 years and PCD. Jasim.¹¹ found the significant relation of bowel motion outcomes of LC with patients younger than 40 but with gender difference. We did not find the significant association of bowel motion outcomes of LC with BMI in this study. However, there are controversial findings of this association in the literature.¹⁰⁻¹⁶ A study conducted among 2660 patients reported 30% of diarrhea in obese individuals compared to 17% in patients with normal weight [OR=2.7 (95% CI 1.1-6.8)].¹⁷ The higher prevalence of diarrhea could be associated with the changes in bile acids leading to bile acid diarrhea.¹⁷ The similar investigations conducted by Talley.¹⁸ and Talley.¹⁹

suggested that this change may be due to the colonic transit and/or an increase in intestinal mucus permeability. Obesity could be related to increasing fecal calprotectin [a marker for bowel inflammation].⁸ The findings reported in this study must be considered with caution

since the patients were selected from one geographic area that may not be representative of the patients across the country. In addition, the patients may report different rates of bowel motions at a longer follow-up period.

Conclusions

This study concluded that LC changed bowel habit in the form of diarrhea but at low rate at two weeks and three months of follow-up regardless of their BMI while more in young age group.

Conflict of interest

The author reports no conflicts of interest.

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