

Short Term Effect of Spilled Bile & Gallstone During Laproscopic Cholecystectomy on Clinical Outcome

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ABSTRACT

Background: Accidental gallbladder perforation during laparoscopic cholecystectomy is on the rise because of increased attempts at minimally invasive surgery. There have been a number of studies attempting to determine the effect of spilled bile and gallstones on the clinical outcomes, but the results are still conflicting.

Aims: This is a randomized prospective study to evaluate the short term effect of spilled bile and gallstones on clinical outcome in patients who sustained a gallbladder perforation.

Method: This study was carried out in Department of General Surgery at Alsader Teaching Hospital and Al-Fayhaa General Hospital in Basrah, Iraq from September 2015 to October 2017 included 396 patients of either gender and different age groups who underwent laparoscopic cholecystectomy.

Results: Sixty-six patients sustained a gallbladder perforation (16.7%). and it primarily occurred during dissection of the hepatic fossa in 42 patients (63.6%). The mean operative time and duration of postoperative hospitalization were longer in the perforated group (P=0.015 and P=0.001). Visual analog scale scores for pain on the first and second postoperative days were higher in the perforated group (P=0.009 and P=0.034). Complications such as ileus and port site infection developed more frequently in patients with a gallbladder perforation (P=0.001 and P=0.004).

Conclusion: Accidental gallbladder perforation can cause more postoperative pain, increase operative time, ileus, and port site infection, which consequently increases the total duration of hospitalization, undermining the advantages of Laparoscopic cholecystectomy. Based on these interesting results, surgeons should make every effort to prevent gallbladder perforation by performing careful and precise dissection during the operation.

Keywords: *laparoscopic cholecystectomy, spillage bile & gall stone, outcome*

Introduction

Gallstone disease constitute a major health problem throughout the world.^{1,2} Its prevalence in the United States adult population is around 10%, rising to 30% in the last two decades.³

Cholecystectomy is the treatment of choice for gallstones disease.⁴ Carl August Langerbach performed first open cholecystectomy in 1882, while Philippe Mouret performed first laparoscopic cholecystectomy in Lyon, France in 1987.⁵

Laparoscopic cholecystectomy has become the standard treatment for gallstone disease and has replaced open cholecystectomy.⁶⁻⁷ In US alone out of 600,000

operations performed annually for gallstones disease, 75% are performed laparoscopically.⁷⁻¹⁰

Laparoscopic cholecystectomy offers the patient the benefits of minimally invasive surgery (MIS) including cosmetic operative scars, better postoperative recovery and early return to work.¹⁰⁻¹¹

However, it is associated with certain complications that have rarely been reported with open cholecystectomy.

Complications of laparoscopic cholecystectomy include complications due to port entry⁸, bowel injuries¹², bleeding¹³ and biliary complications including spilled bile and gallstones¹⁴, biliary leaks and bile duct injuries.^{9,15}

Perforation of gallbladder and spillage of gallstones during laparoscopic cholecystectomy is a frequently observed phenomenon. Its estimated incidence is reported to be between 3% and 33%.^{14,16}

Moreover, gallbladder perforation is increasing in frequency because of increased efforts to perform minimally invasive surgery, which has limited the visual field and mobility of the surgical instruments.

A number of studies have demonstrated the effect of intraperitoneal contamination with spillage of bile juice and gallstones. Previously the majority of surgeons believe that gallstone spillage during laparoscopic cholecystectomy is a benign complication and it does not justify conversion to laparotomy, even if a large number of gallstones remain in the abdomen.¹⁸⁻²²

However, there are also some reports that have demonstrated the complications of gallstone spillage, such as intraperitoneal abscesses, adhesions, small bowel obstruction, cutaneous fistulas, and septicemia.^{15,23}

Aim of This Study

Aim of this study is to evaluate the short term effect of spilled bile and gallstones on clinical outcome in patients who sustained a gallbladder perforation.

Patients and Method

This is a randomized prospective study, was conducted in department of General Surgery at Al-sader Teaching Hospital and Al-Fayhaa General Hospital in Basrah, Iraq from September 2015 to October 2017.

The study included 396 patients of either gender and different age groups who underwent laparoscopic cholecystectomy.

Those patients with gallbladder neoplasms, patients with coexisting stones within the common or hepatic duct, were excluded from the study.

All patients were fully informed and a written consent was taken. And also a predesigned proforma which included: age, gender, stage at which gallbladder perforation occur, operative time post-operative pain, postoperative complications(fever, vomiting, ileus, port site infection) and duration of hospital stay was made for all patients.

A detailed history, clinical physical examination and investigations included complete blood count, blood urea, serum creatinine, blood glucose, liver function test, electrocardiography, chest X-ray and ultrasound of abdomen were done for all patients.

Operative time (in minute): mean time start from skin incision till finishing the skin closure.

Postoperative hospital stay: means number of days spent in the hospital from the day of operation till discharge of the patients to their home.

Port site infection is diagnosed based on clinical findings such as increased redness and pain with pus discharge.

Post-operative pain was assessed by the VAS(Visual Analogue Scale).

Visual Analogue Scale (VAS) : is a measurement instrument that tries to measure a characteristic or attitude that is believed to range across a continuum of values and cannot easily be directly measured for pain. VAS ranges from no pain (0) to the most severe pain (10). As shown in fig (1).

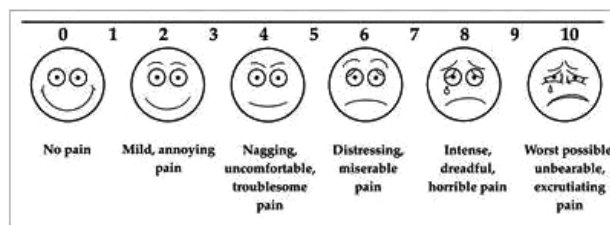


Figure 1 : Visual analogue scale

A patients who underwent laparoscopic cholecystectomy were operated on nearly by same team of surgeons.

All patients received dose of one gram Third generation cephalosporin intravenously at time of induction for prophylaxis (single dose) and twice daily for 3 days postoperatively.

Surgical Technique: All operations were performed with the patient under general anesthesia. The umbilical port using an 10-mm trocar was introduce by closed method and CO₂ gas was insufflated to establish a pneumoperitoneum with an intraperitoneal pressure of 12-15 mmHg. Under visual confirmation, an Epigastric port was inserted into the right border of the falciform

ligament with a 10-mm trocar, Midclavicular port 5-mm and Anterior axillary line port 5-mm was made. The operating table was placed in the reverse Trendelenburg position and tilted to the left.

We used the technique of critical view of safety by releasing lateral peritoneal attachment of gallbladder for better dissection of calot's triangle. Then dissection was continued from posterior aspect of calot's triangle to identify the cystic artery and cystic duct. Clipping and division of cystic duct then cystic artery were achieved. Gallbladder was dissected off its bed in the liver with monopolar cauterization of any bleeding points.

In case of perforation of the gallbladder, prompt aspiration of bile spillage and retrieval of residual stones were done by using endobag and then abundant irrigation. Also put a drain according to the operative field.

The surgeons assessed the suitability for discharge, considering the clinical symptoms. And continue follow up the patients for 2 week from day of admission.

All the data were analyzed by using SPSS system version 20 with P- value of < 0.05 regarded as significant.

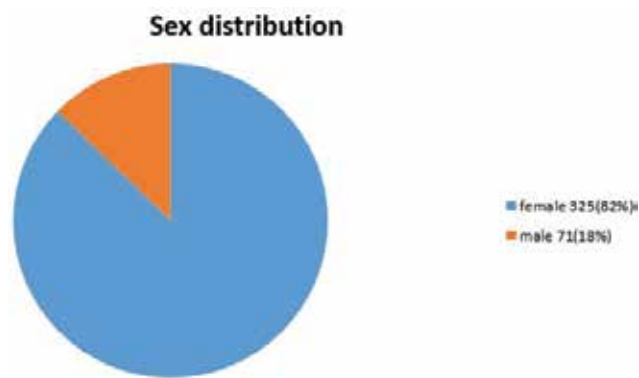
Results

This study included 396 patients who underwent laparoscopic cholecystectomy, 66 patients sustained a gallbladder perforation (16.7 %).

The age distributions and number of patients who sustained gallbladder perforation are shown in table(1). and the figure shows sex distributions in which most of the patients are females (325 (82%)), while only (71 (18%)) are males.

Table I: Age distribution of the study population

Age (years)	No.	NO. of patients with gallbladder perforation
10-20	9	1
21-30	150	25
31-40	130	21
41-50	94	15
51-60	8	3
61-70	5	1
Total	396	66



Gallbladder perforation primarily occurred during dissection of gallbladder from the hepatic fossa in 42 patients (63.6%). There were also 12 cases perforation occur during traction of gallbladder, 10 cases perforation occur during dissection of cystic duct and two cases during extraction of the gallbladder through a port site. (Table 2).

Table (3). Shows a short term effect of spilled bile and gallstones on clinical outcomes. The mean operative time and the duration of the postoperative hospital stay were significantly longer in the perforated group (P = 0.015 and P =0.001).

All patients used the same components of analgesia but the VAS scores for pain on the first and second days after surgery were higher in patients with a gallbladder perforation (P =0.009 and 0.034).

The postoperative complications, such as fever, vomiting, were not different between groups. While, ileus (the patient complains of abdominal discomfort with symptoms of constipation) and port site infection, were significantly more common in the perforated group (P = 0.001 and P = 0.004).

Table II: Stage at which gallbladder perforation occurs

Stage	Number of patients	%
Traction or grasping of gallbladder	12	18.2
Dissection of cystic duct	10	15.2
Dissection gallbladder from hepatic fossa	42	63.6
Extraction of gallbladder through port site	2	3.0
Total	66	100

Table III: Shows a short term effect of spilled bile and gallstones on clinical outcomes

Clinical outcomes	Nonperforated groups	Perforated groups	P value
Operative time (Min ± SD)	50.04 ± 28.24	69.83 ± 40.14	0 .015
Postoperative hospital stay (Day ± SD)	3.50 ± 2.14	5.58 ± 3.09	0.001
Postoperative pain(VAS ± SD)			
First POD	2.56 ± 1.74	3.50 ± 2.16	0.009
Second POD	1.88 ± 2.16	2.50 ± 1.85	0.034
Postoperative complications			
Fever	42(12.8%)	8(12.1%)	0.104
Vomiting	50(15.2%)	10(15.2%)	0.989
Ileus	52(15.9%)	28(42.4%)	0.001
Port site infection	10(3.0%)	10(15.2%)	0.004

Discussion

During the past decade, laparoscopic cholecystectomy has become the standard surgical procedure for gallbladder disease. Laparoscopic cholecystectomy offers a variety of advantages, such as decreased postoperative morbidity, shorter hospital stay, quicker return to normal activities and work, and improved cosmesis, compared with open cholecystectomy.¹⁹

In our study, the rate of gallbladder perforation was 16.7%, which was similar to the average rate reported by others.¹⁹⁻²¹

The wall of the gallbladder may be torn by traction and repetitive grasping, and it may also be inadvertently entered during dissection from the hepatic fossa with cautery, which was the most common cause of gallbladder perforation in the present study.

Some studies have reported that intraperitoneal contamination with bile and gallstone does not affect the clinical outcomes.^{20,22,24,25}

However, there are also many cases of postoperative complications, such as intra-abdominal abscesses and wound infections, and one study reported that complications occur in about 1.7 per 1000 laparoscopic cholecystectomy with gallbladder perforation.^{23,26,27}

Gallbladder perforation and spillage of bile and gallstones leads to prolongation of the operative time and postoperative hospital stay and consequently an increase in the total hospital costs, which reduces the advantages of laparoscopic cholecystectomy compared with open cholecystectomy.

The mean operative time was longer in the perforated group, and it was likely to be due to the time required for abundant irrigation to obtain a clear aspiration and retrieve the gallstones.

The postoperative hospital stay was also longer in the perforated group, which may be due to increased pain and ileus, including constipation which may result from irritation of the peritoneum due to the spillage of bile juice and gallstones.

There were ten cases of significant port site infection in the perforated group, but the result could have been affected since we had used prophylactic perioperative antibiotics in all patients.

Sometimes the spilled gallstones mimic a malignancy, requiring the patient to spend time and money for unnecessary examinations, as well as the psychological trauma associated with the incorrect diagnosis of malignancy.¹⁵ Therefore, the surgeon should inform the patient about the possible consequences of spillage of bile and gallstones and should not hesitate to record the events.

Closing the perforated part of a gallbladder with application of a clip or an Endoloop is a possible solution to prevent spillage after gallbladder perforation, but it is ineffective in many cases because the clip or Endoloop may slip or loosen during traction.

Conclusion

In conclusion, short term effect of gallbladder perforation during laparoscopic cholecystectomy causes more postoperative pain, more operative time, ileus,

and port site infection, which consequently leads to an increase in the duration of hospitalization, thereby reducing the advantages of a laparoscopic procedure.

We should remember the interesting finding that careful and precise dissection should be performed during operation to prevent gallbladder perforation.

In addition, the surgeons should not hesitate to record the intraoperative events of spillage bile and gallstones and inform the patient about the possible consequences.

Ethical Clearance: Taken from health committee

Source of Funding: Self

Conflict of Interest: No

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