

**ORIGINAL RESEARCH****Early Post operative Complications of Gallstone spillage During Laparoscopic Cholecystectomy–A Prospective Study****<sup>1</sup>Dr Prerna RT, <sup>2</sup>Dr Sarabjeet Singh, <sup>3</sup>Dr Ashwani Kumar, <sup>4</sup>Dr Vikas Chalotra**<sup>1</sup>Senior Resident, <sup>2</sup>Professor, <sup>3</sup>Associate Professor, <sup>4</sup>Assistant Professor, Department of General Surgery, GGS Medical College and Hospital, Faridkot, Punjab, India**Correspondence:**

Dr Vikas Chalotra

Assistant Professor, Department of General Surgery, GGS Medical College and Hospital, Faridkot, Punjab, India

**Email:** [vikaschalotra88@gmail.com](mailto:vikaschalotra88@gmail.com)**Abstract**

**Background** – Biliary tract disorders are one of the commonest abdominal conditions that the surgeons come across. Gall stones or cholelithiasis is a frequently encountered pathology. Laparoscopic cholecystectomy is now the gold standard in the management of gall bladder diseases. However, it is not without any drawbacks, of which the less frequent problem is the gall stone spillage. The insight into the early postoperative complications of gall stone spillage helps to manage and treat the complications at the earliest. Hence this study was undertaken.

**Objective** – To evaluate post operative clinical, haematological, radiological parameters of patients with gall stone spillage with application of this knowledge for prevention and management of gall stone spillage and complications.

**Materials and Methods** –A prospective study was conducted from May 2019 to November 2020 after obtaining Institutes ethical committee approval. Data was collected intra operatively and post operatively from 40 patients who had gall stone spillage during laparoscopic cholecystectomy. These patients were assessed by clinical history, physical examination and relevant investigations on Post op day 7, Post op 4th week and post op 12th week to see for development of any complications. All the results were analysed by SPSS software. Chi square test were used for assessment of level of significance.

**Results** –Out of 40 patients with gall stone spillage, 8 patients presented with persistent abdominal pain on POD7 and 1 patient presented with discharge from wound on POD7. Patients were assessed by clinical and radiological examination. Laboratory parameters were analysed and managed conservatively. Rest of the patients had uneventful post operative period.

**Conclusion** – Safe attempt for retrieval, thorough peritoneal lavage with normal saline and adequate post op cover with antibiotics can minimise further complications of spilled and unretrieved gall stones.

**Key words** – Laparoscopic cholecystectomy, gall stone spillage, lost gall stones, complications of gall stone spillage.

**Introduction**

Biliary tract disorders are one of the commonest abdominal conditions that the surgeons, gastroenterologists and radiologists come across. Gallstones are present in about 3-6% of adult Indian population(1). Laparoscopic Cholecystectomy (LC) is the gold standard treatment of gall stone disease. Gall stones can be spilled during manipulation by instruments

or during dissection from the liver bed. Several studies show that incidence of spilled gall stones during LC is about 5-40 % of surgeries performed (2). Dense adhesions around gall bladder or a tense, distended gall bladder that has not been decompressed is at risk of perforation. Spilled stones may also be caused when gallbladder is being retrieved from the port site due to either slipping of cystic duct clip or tearing of gall bladder. In open cholecystectomy spilled stones can be retrieved easily compared to Laparoscopic Cholecystectomy where stones can be lost in peritoneal cavity. Complications from stones lost in the peritoneal cavity can cause unusual but significant morbidity (3). If spillage occurs, normal saline irrigation of peritoneal cavity and aspiration should be done. Most complications occur within first few months but presentations upto 10 years after the procedure have also been documented. The variety of complications caused by gall stones spillage may range from surgical site infection to more serious forms like broncholithiasis. The incidence of complications related to spillage of gall stones ranges between 2.3 and 7%. This increases by greater than twofold when the stones are unretrieved (4). Complications are often delayed and require a high index of clinical suspicion for diagnosis. Ultrasound, computed tomography and magnetic resonance imaging (MRI) are valuable diagnostic and interventional tools (5). Use of clips or an endoloop to close the hole in the gall bladder, use of organ retrieval bag and place it on the liver to receive all spilled stones are some of the measures to prevent gall stone spillage. For lost gall stones, use of Antibiotic prophylaxis according to culture and sensitivity examination of spilled stones is suggested (6).

### Materials and methods

This study was conducted in the Department of General Surgery at Guru Gobind Singh Medical College and Hospital, Faridkot, Punjab, India from March 2019 to November 2020. 40 consecutive Patients with symptomatic cholelithiasis and operated for Laparoscopic Cholecystectomy with gall stone spillage and lost gall stones were included in the study. Exclusion criteria included patients with Chronic Obstructive Pulmonary Disease, Coronary Artery disease, Coagulation disorder, CBD stone, Pregnancy, Suspected carcinoma, Pelvic inflammatory disease, patients on immunosuppressant drugs, patients not willing for Laparoscopic Cholecystectomy. Ethical clearance from the Institute Ethics Committee was taken and informed consent was taken from the patients participating in the study. A standard Laparoscopic Cholecystectomy was performed. The data was collected intraoperatively and postoperatively from 40 patients who had gall stone spillage and lost gall stones during Laparoscopic Cholecystectomy. Data was recorded and events were summarized. The following data was collected on POD 7, Post operative 4th week and Post operative 12<sup>th</sup> week.

Observation	Number of patients	Percentage
Pain abdomen		
Fever		
Abdominal distension		
Any other complaint		
Tachycardia		
Hypertension/hypotension		
Increased temperature		
Tachypnea		
Findings in examination of abdomen, chest		
Wound complications		
Any abnormalities in laboratory parameters		
Hb		
TLC		

LFT RFT		
Abnormal findings in USG Abdomen		
Any other investigation		

### Statistical Analysis

Data analysis was done using SPSS version 22.0. Descriptive statistics was done and the qualitative data were expressed in percentage. Categorical variables were compared with the Chi Square test. All tests were performed at 5% level of significance. All reported p-values were two tailed, p-value of <0.05 was considered significant, while p-value of <0.01 was considered highly significant.

### Observation and results

Data was collected intraoperatively and post operatively (POD 7, Post operative 4<sup>th</sup> week, post operative 12<sup>th</sup> week) from 40 patients who had gall stone spillage while undergoing Laparoscopic Cholecystectomy operation during a period from May 2019 to November 2020. The patients were observed during early post-operative period (post op day 7, post operative 4th week, post operative 12th week) for the development of any complications because of gall stone spillage.

**Table 1**

Age (y)	No. of cases	Percentage
18- 30	10	25.0%
31-40	14	35.0%
41-50	12	30.0%
51-60	1	2.5%
>61	3	7.5%
Total	40	100.0%

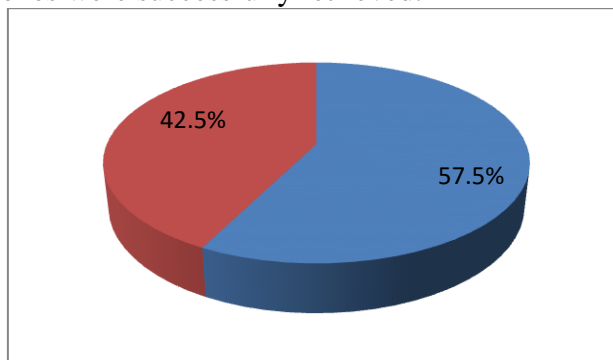
Table 1 shows distribution of patients according to age group. Maximum number of patients i.e, 14 (35%) were in the age group of 31 to 40 years. Mean age of the patients in present study was 39 years.

**Table 2**

Sex	No. of cases	Percentage
F	33	82.5%
M	7	17.5%
Total	40	100.0%

Table 2 show the gender wise distribution of patients. 82.5% (33) of patients in the present study were females, while the remaining 17.5% (7) of the patients were males.

Graph 1 shows the proportion of unretrieved/lost gall stones among patients with gall stone spillage. 42.5% (17) of the patients have unretrieved gall stones while in 57.5% (23) of patients, spilled gall stones were successfully retrieved.

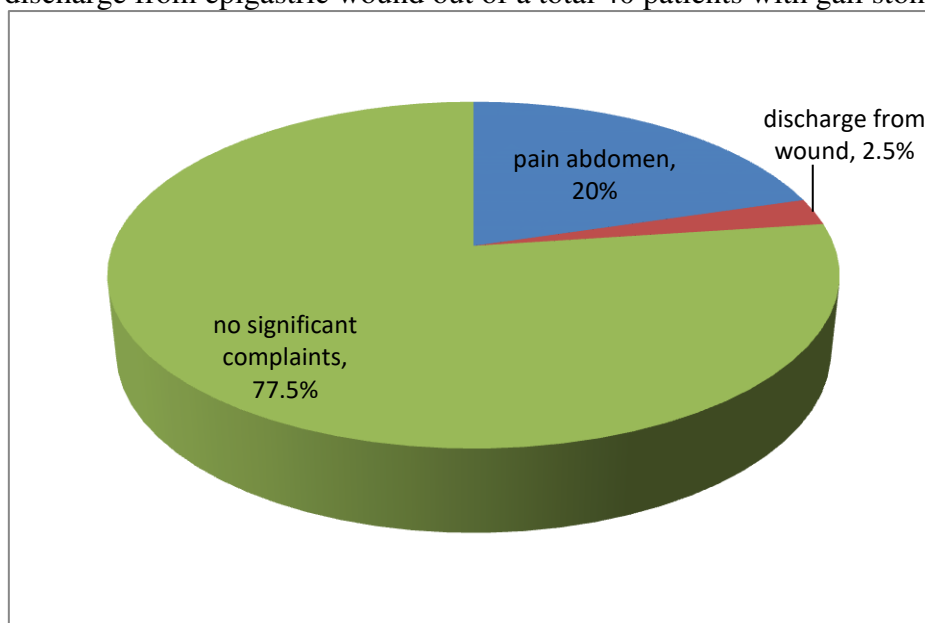


**Table 3:- Observation and findings noted on 7<sup>th</sup>, 4<sup>th</sup> week and 12<sup>th</sup> week post operative day after laparoscopic cholecystectomy**

Observations	POD 7		Post op 4 <sup>th</sup> week		Post op 12 <sup>th</sup> week		p value
	No. of Patients	% age	No. of Patients	% age	No. of Patients	% age	
Pain abdomen	8	20%	Nil	Nil	Nil	Nil	0.533
Fever	Nil	Nil	Nil	Nil	Nil	Nil	
Abdominal distension	Nil	Nil	Nil	Nil	Nil	Nil	
Any other complaint	Nil	Nil	Nil	Nil	Nil	Nil	
Tachycardia	Nil	Nil	Nil	Nil	Nil	Nil	0.641
Hypertension/hypotension	Nil	Nil	Nil	Nil	Nil	Nil	
Increased temperature	Nil	Nil	Nil	Nil	Nil	Nil	
Tachypnea	Nil	Nil	Nil	Nil	Nil	Nil	
Findings in examination of abdomen, chest	Nil	Nil	Nil	Nil	Nil	Nil	
Wound complications	1	2.5%	Nil	Nil	Nil	Nil	0.641
<b>Any abnormalities in laboratory parameters</b>							
Hb	Nil	Nil	Nil	Nil	Nil	Nil	
TLC	Nil	Nil	Nil	Nil	Nil	Nil	
LFT	Nil	Nil	Nil	Nil	Nil	Nil	
RFT	Nil	Nil	Nil	Nil	Nil	Nil	
<b>Abnormal findings in USG Abdomen</b>	Nil	Nil	Nil	Nil	Nil	Nil	
<b>Any other investigation</b>	Nil	Nil	Nil	Nil	Nil	Nil	

Table 3 shows 8 out of 40 patients with gall stone spillage have persistent pain abdomen at POD 7 and 1 out of 40 patients with gall stone spillage has wound complications at POD7. Rest all the patients did not develop any early complications related to gall stone spillage on 12 weeks follow up.

Graph 2 shows the proportion of patients with early complications observed such as pain abdomen, discharge from epigastric wound out of a total 40 patients with gall stone spillage.



## Discussion

Laparoscopic Cholecystectomy has surpassed open cholecystectomy as gold standard for any symptomatic gall stone disease since its introduction in 1980s, because of advantages like speedier recovery, shorter hospital stay and earlier return to work. The possible complications are increased risk of bile duct injury, gall stone spillage, bowel injury etc. Although the rate of CBD injuries from LC has declined, the incidence of gall stone spillage into the abdominal cavity has remained unchanged. The limited space for dissection, issues with instrumentation that causes laceration of the gall bladder, the limited ability of the surgeon to retrieve spilled stones Laparoscopically leads many surgeons to leave them behind. Total number of patients in the study was 40 of which 65% were in the age group of 31-50 years. 33/40 patients were females (F>M) as it was seen that gall stone disease was more common among females. Similar age and sex distribution was seen in studies conducted by Mazin Abdulsattar Abdulla et al, Peponis et al, Suvi virupaksha et al(7-9). Total 40 cases of patients with Gall stone spillage during Laparoscopic Cholecystectomy was studied amongst which 57.5% of patients spilled gall stones were retrieved. In a study by J.G.Brockman et al, retrieval was possible in 63% of cases (10). Peritoneal lavage was done in 100% of the cases. The patients were kept Nil per oral for minimum 12h and on IV fluids. The patients were given standard antibiotic treatment and NSAIDs(Diclofenac). The patients were followed up during the early postoperative period (POD7, post op 4<sup>th</sup> week, post op 12<sup>th</sup> week). 8 patients were noted to have pain abdomen and 1 patient had serous discharge from the epigastric wound on POD7. The incidence of complication is 22.5%. However upon clinical examination, there were no significant abnormalities. The patients were subjected to various biochemical, haematological and radiological investigations like Hb, TLC, LFT, RFT and USG Abdomen, which were found to be within normal limits. The epigastric wound was explored for any fragments of gall stones, thoroughly washed with normal saline and was treated with regular ASD. In a study conducted by Mazin Abdulsattar Abdulla et al, out of 73 cases with gall stone spillage, eight patients developed complications, one patient developed ileus, two patients developed sub-hepatic abscess, presenting with right hypochondrium & shoulder tip pain and fever post operatively. Three patients developed epigastric port site infection. Two patients developed sub-hepatic and right sub-phrenic abscess respectively in the seventh postoperative day (7). In a study conducted by Suvi virupaksha et al, out of 150 Laparoscopic Cholecystectomy conducted over a year, 19.04% cases had gall stone spillage of which at the 1-week postoperative follow-up, one patient complained of pain and discharge at the umbilical port site (9). The apparent high incidence of pain abdomen can also be due to the deleterious effects of usage of higher antibiotics and analgesics used in order to prevent complications in the first place, such as Acid peptic disease. The patients were put on regular antacids and Proton pump inhibitors. All the 40 patients were followed up on post operative 4th week and post operative 12th week. They were asymptomatic. Clinical, haematological, biochemical and radiological investigations were within normal limits. Thus it can be said that there might be a significant incidence of gall stone spillage during LC. While our study showed lower number of non significant complications which did not lead to any serious outcome, the recommendation is that every attempt should be done to extract all possible gall stones spilled in abdominal cavity. It is important to note that the spillage itself should be prevented to the extent possible (11,12).

## Conclusion

Gall stone spillage during Laparoscopic Cholecystectomy is common due to certain avoidable and non avoidable factors. Safe attempt for retrieval, thorough peritoneal lavage with normal saline and adequate post operative cover with antibiotics can minimize further complications of spilled and unretrieved gall stones.

**References**

1. Singh V, Trikha B, Nain C, Singh K, Bose S. Epidemiology of gallstone disease in Chandigarh: A community-based study. *J Gastroenterol Hepatol*. 2001; 16:560-3.
2. Sathesh-Kumar T, Saklani AP, Vinayagam R, Blackett RL. Spilled gall stones during laparoscopic cholecystectomy: a review of literature. *Postgrad Med J*. 2004; 80: 77-9.
3. Sansiya K, Dodia H, Patel D, Patel N. Evaluation of Gallbladder Content Spillage in Laparoscopic Cholecystectomy. *IOSR J Dent Med Sci (IOSR-JDMS)*. 2015; 14: 105-22.
4. Diez J, Arozamena C, Gutierrez L. Lost stones during laparoscopic cholecystectomy. 1998; *HPB Surg* 11:9-11.
5. Johnston S, O'Malley K, McEntee G. The need to retrieve the dropped stone during laparoscopic cholecystectomy. *Am J Surg*. 1994; 167:608-10.
6. Chowbey PK, Bagchi N, Sharma A, Khullar R, Soni V, Baijal M. Abdominal Wall Sinus: An unusual presentation of spilled gallstone. *J Laparoendosc Adv Surg Tech A* 2006; 16: 613-5.
7. Jasim.D.Saud, Mmazin.A.Abdulla, Mushtaq Ch Abu-Alhail. Spilled gall stones during laparoscopic cholecystectomy : A prospective study. *Bas J Surg*. March 17 2011; 65-71.
8. Peponis T, Eskesen TG, Mesar T, Saillant N, Kaafarani HMA, Yeh DD, Fagenholz PJ, de Moya MA, King DR, Velmahos GC. Bile Spillage as a Risk Factor for Surgical Site Infection after Laparoscopic Cholecystectomy: A Prospective Study of 1,001 Patients. *J Am Coll Surg*. 2018; 226: 1030-5.
9. Suvi Virupaksha. Consequence of spilt gall stones during laparoscopic cholecystectomy. *Indian J Surg*. March-April 2014; 76: 95-99.
10. Brockmann JG, Kocher T, Senninger NJ, Schurmann GM. Complications due to gallstones lost during laparoscopic cholecystectomy. *Surg Endosc*. 2002; 16: 1226-32.
11. Khan MI, Khan H, Ghani A. Frequency of spilled gallstones and bile leak in laparoscopic cholecystectomy. *Pak J Surg*. 2011; 27: 95-9.
12. Hoecke MV, Lissens P, Vuylsteke M, Verdonk R. Lost gallstones: a relaparoscopic solution to laparoscopic pollution. *Acta Chirurgica Belgica*. 2014; 104: 104-6.