ORIGINAL ARTICLE

# Frequency of spilled gallstones and bile leak in laparoscopic cholecystectomy

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**Abstract**

**Objectives: Laparoscopic cholecystectomy is regarded as the treatment of choice for symptomatic gallstones disease throughout the world. Two well known complications of the procedure are bile leak and spilled gallstones. To determine the frequency of bile leak and spilled gallstones during laparoscopic cholecystectomy in our setup.**

**Study design: It was a prospective descriptive study.**

**Setting and duration: Surgical "C" Unit Khyber Teaching Hospital, Peshawar, from June 10, 2009 to April 8, 2010.**

**Methodology: Patients having gallstones were admitted from OPD. They were registered for the study after obtaining informed written consent. All relevant investigations were performed. Fitness for anaesthesia was assessed by ASA Scoring system. Patients underwent Laparoscopic cholecystectomy. Data was recorded on a predesigned proforma.**

**Results: A total of 142 patients had laparoscopic cholecystectomy during the study period. Average age was 39.21 years ± 11.98. Spillage of gallstones was the major complication occurring in 15 (10.6%) cases where maximum number of stones was recovered during the procedure. Spilled gallstones were common in females than males. A total of 5 (3.52%) patients had bile leakage.**

**Average hospital stay was 1.94 days ± 0.62. There was no mortality in our study.**

**Conclusion: Laparoscopic cholecystectomy is a safe and effective procedure in our setup and gives better results in expert hands.**

**Keywords: Laparoscopic Cholecystectomy, Biliary Leakage, Spilled Gallstones**

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**Introduction:**

Gallstones 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 over 70 years age group. In Pakistan the prevalence of GS disease is 15% accounting for 22% admissions in a surgical unit.[3] Cholecystectomy is the treatment of choice for gallstone disease.[4] Carl August Langerbach performed first open cholecystectomy in 1882, while philleppe Mouret performed first laparoscopic cholecystectomy in Lyon, France in 1987.[6] The first laparoscopic cholecystectomy in Pakistan was performed in 1991.[7] The first such procedure in Peshawar was performed in Khyber Teaching Hospital Peshawar by a visiting surgeon from Singapore in 1992.[8] It is currently the most common operation performed worldwide[9].

Laparoscopic cholecystectomy has become the standard treatment for gallstone disease and has replaced open cholecystectomy. [10,11] In US alone out of 600,000 operations performed annually for gallstone disease, 75% are performed laparoscopically.[11-14] Laparoscopic cholecystectomy offers the patient the benefits of minimally invasive surgery (MIS) including cosmetic operative scars, better postoperative recovery and early return to work.[14,15] However, it is associated with certain complications that have rarely been reported with open cholecystectomy.

Complications of laparoscopic cholecystectomy include early and late complications. Early complications include complications due to port-entry[12], bowel injuries[16], bleeding[17] and biliary complications including spilled gallstones[18], biliary leaks and bile duct injuries.[13, 19]

Spillage of gallstones during laparoscopic cholecystectomy is a frequently observed phenomenon. Its estimated incidence is reported to be between 3 and 33%.[18,20] The rate of complications occurring from these unretrieved stones is about 0.3%.[21] Bile leak after laparoscopic cholecystectomy is seen in 0.3-2.7% of patients.[22] Although most surgeons regard spilled intraperitoneal gall stones as inconsequential, Post-operative peritonitis, adhesions, intra and extra abdominal abscesses, biliary, enterocutaneous and enterovesical fistula formation have been documented.[20, 22]

Laparoscopic cholecystectomy is an evolving procedure for gallstone disease in Pakistan.[19] There is a trend in favour of laparoscopic cholecystectomy over open cholecystectomy. Complications of laparoscopic cholecystectomy have been studied in various centers; however, it needs to be reproduced in our center as no scientific data has been published from our center. The purpose of studying complications is to develop a future planning for the prevention and treatment of complications of laparoscopic cholecystectomy. The study was conducted to determine the frequency of spillage of gallstones and bile leak in laparoscopic cholecystectomy.

**Methodology:**

This prospective descriptive study of 142 patients was carried out in Surgical C Unit of Khyber Teaching Hospital, Peshawar, after the approval of Hospital Ethical Committee from June 2009 to April 2010. patients with obstructive jaundice, carcinoma gall bladder, comorbid diseases and history of upper abdominal surgery were excluded as these are the confounders and would produce bias in the study results. Patients having gallstones were admitted from OPD. They were registered for the study after obtaining informed written consent. All relevant investigations were performed. Fitness for anaesthesia was assessed by ASA Scoring system. All the included patients underwent Laparoscopic cholecystectomy.

**Results:**

A total of 142 patients had laparoscopic cholecystectomy during the study period. Average age was 39.21 years ± 11.98. Majorities, (36.6%), of the cases were aged between 30-40 years, 27.5% were in 41-50 years while 30(21.1%) patients were below 30 years and 4(2.8%) patients had age more than 60 years. Male to female ratio was found 1:2.84. In our study 37(26.1%) were male and 105(73.9%) females, as shown in Figure 1.

Spillage of gallstones was the major complication occurring in 15 (10.6%) cases where maximum numbers of stones were recovered during the procedure. There were 2 (1.4%) patients of age 19-29years of age, 7 (4.9%) patients of 30-40 years, 4 (2.8%) patients of 41-50 years, 1 (0.7%) patient of 51-60 years and 1(0.7%) patients had 61-70 years, as shown in Figure 2.

Spilled gallstones were common in females than males. The frequency of spilled gallstones was 5 (3.5%) for males and 10 (7.00%) for females. There were 4 (2.8%) patients having bile leak of age 30-40 years and 1(0.7%) patient had leak in 41-50 years.

Of all the patients, 1(0.7%) patients had bile leak in males and 4 (2.8%) patients were females. Average hospital stay was 1.94 days ± 0.62. Majority of the patients, 137 (96.5%), were discharged within 2 days, 1(0.7%) patients on 3rd day, 2 (1.4%) patients on 4th day and 1(0.7%) patient each were discharged on 5th and 6th hospital day. Hospital stay was prolonged in the patients having bile leak. In addition 11 (7.5%) patients were converted to open cholecystectomy while in 131 (92.3%) patients the procedure was successfully completed laparoscopically. There was no mortality in our study.

**Discussion:**

Laparoscopic cholecystectomy has established itself as the gold standard treatment for symp-

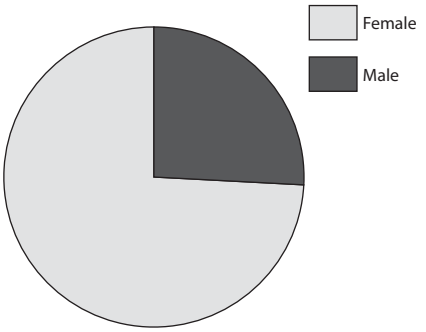


Figure 1: *Gender distribution*

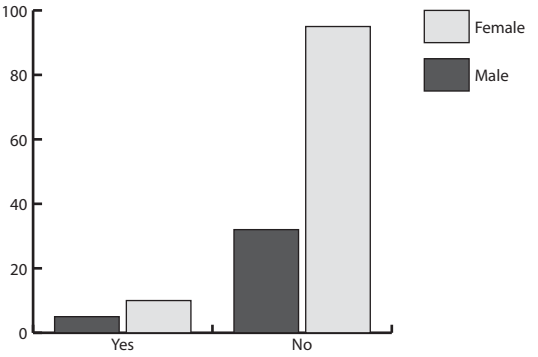


Figure 2: *Frequency of spilled gallstones*

tomatic gallstones and chronic cholecystitis replacing conventional open cholecystectomy.[25,29] In acute cholecystitis, most surgeons now prefer laparoscopic cholecystectomy.[8] The laparoscopic technique is rapidly gaining popularity and is frequently being performed in almost all major hospitals in our country. The laparoscopic approach has got numerous advantages but the morbidity is slightly higher especially in training facilities.[29]

This study was specially aimed to focus on two frequently seen complications of LC namely bile leak and spilled gallstones. In our study the mean age was 39.21 years, majority (36.6%) of the patients were in the age group 30-40 years while (2.8%) were less than 30 years of age. 105(73.9%) were females. In a study of Mufti et al the mean age was recorded to be 40.30 years, and majority (31.66%) of patients were in the 30-40 years age group.[5] However in a study of LC in acute cholecystitis the mean age was 43.7 years with a female to male ratio was 4.5:1. 38 In another study of 281 cases of LC there were 140 men and 141 women with a mean age of 56.9 years (range 23-89 years).[30]

In our study we used the classical 4-port approach in all the cases. However a three port technique[26] and recently a two port cholecystectomy using 3 mm miniaturized instruments is considered feasible and may further improve the surgical outcomes in terms of pain and cosmesis.[31] In our cases we used the veress needle for creating pneumoperitoneum, however in one of the studies on LC, direct insertion of trocar without pneumoperitoneum was shown to be safe, efficient, time saving alternative technique, with less procedure related complications.[32] Bile duct injury is a severe and potentially life threatening complication of LC and several studies report 0.5% to 1.4% incidence of bile duct injuries.[33] In our series bile duct injury was minimum and biliary leak occurred in only 5(3.5%) cases. In 4(2.8%) cases the leak stopped in 3-5days after operation without any intervention while in 1(0.7%) case of major common bile duct (CBD) injury, ERCP and stenting was done. In a study conducted by Muqim et al, major bile duct injuries occurred in 0.57% of cases.[39] In a large study by Adamsen et al. incorporating 7654 patients undergoing LC, the incidence of bile leak was 2.1%.[34] Muqim et al reports bile leak incidence in 3.9% patients in his study on 351 patients.[26] Mufti et al reported 3.3% incidence of bile leak in his study.[5] In a large series including 15,596 patients undergoing LC, 163 suffered vascular injury requiring conversion with a rate of 8%.[11] Chi-leung Liu et al reported conversion rate of 9% in his study on 500 patients.[36] Concomitant vascular injuries during LC increase the overall morbidity.[23]

In our study, 11(7.7%) patients were converted to open surgery due to complications. Tayab M et al, in their study identified two preoperative risk factors for conversion, ultrasonographic signs of inflammation and age more than 60 years.[23] Al Salamah has reported disturbed anatomy in the region of Calot's triangle as the most common cause of conversion observed in 41.5% of converted cases while male gender, age over 65 years, high leukocytes count, gallbladder wall thickness more than 4 mm on USG were

observed as the most significant determinants for conversion to open procedure.[25] Spillage of gallstones into the peritoneal cavity during LC occurs frequently due to gallbladder perforation and may be associated with complications, and every effort should be made to remove spilled gallstones but conversion is not mandatory.[28, 37] Incidence is estimated between 10% and 30%.[11] Abscess and fistula formation in the abdominal wall after stone spillage has been reported.[28] In a retrospective study from Switzerland, only 1.4% of patients with spillage of gallstones during LC developed serious postoperative complications.[11] In our study gallstone spillage occurred in 15(10.6%) cases and maximum number were retrieved during the procedure. In a study conducted by Muqim et al no postoperative complications due to spilled gallstones were recorded.[26]

Bile duct injury during LC is a dreaded complication of LC and may lead to post operative benign biliary strictures after few months, increasing the morbidity and mortality related to the procedure.[38] Late postoperative strictures are usually the result of excessive use of electrocautery near CBD or late complication of biliary reconstruction for injuries after cholecystectomy.[39]

In our study major bile duct injuries occurred in 1(0.7%) case. MRCP and ERCP were done, which showed a lateral bile duct injury. In the same session stenting was done with good outcome.

Average hospital stay was 1.94 days which is comparable to a study carried out locally at Khyber Teaching Hospital where it was recorded to be 2.06 days 4while it has been reported as 2.29 days in a study from a single center by Vagenas K et al.[27]

Inspite of the above mentioned complications the overall outcome was satisfactory, with better patient acceptance of the procedure.

**Conclusion:**

LC is the most frequently performed procedure for symptomatic gallstone disease. It is a safe and effective procedure in our setup in experienced hands. Most of the complications occurred due to lack of experience and over enthusiasm. A proper preoperative work up, a low threshold for conversion and adequate training and equipment makes this operation a safe procedure with good outcome.

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