

Frequency of Biliary Complications in Laparoscopic Cholecystectomy

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ABSTRACT

Background and Aim: Laparoscopic cholecystectomy is considered the most challenging laparoscopic procedure used for gallstones removal and has a higher prevalence of bile-duct injuries compared to open cholecystectomy. The aim of the present study was to evaluate the frequency of biliary complications in laparoscopic cholecystectomy.

Materials and Methods: This cross-sectional study was carried out on 40 patients with cholecystitis in Surgery department of Polyclinic Hospital, Rawalpindi Pakistan for duration from November 2020 to June 2021. An informed consent form was taken from each individual. All the symptomatic gallstones disease patients were enrolled irrespective of their age and gender in this study. Ethical approval was taken from the respective hospital ethical review committee. The Laparoscopic cholecystectomy complications were bile duct injuries, cystic artery bleeding, retained biliary stone, bile duct leakage, abdominal pain, and internal bleeding following surgery and mortality. SPSS version 20 was used for data analysis.

Results: Of the total 40 cholecystitis patients, the prevalence of female and male patients were 35 (87.5%) and 5 (12.5%) respectively. The overall prevalence of laparoscopic cholecystectomy complications was found in 29 (72.5%) patients. The most prevalent complication was retained stone 13 (32.5%) cases followed by biliary duct leakage and injuries in 7 (17.5%) cases. Cystic artery bleeding was present in 5 (12.5%) cases. Other post-surgery complications were artery cystic bleeding in 3 (7.5%) cases and abdominal pain in 1 (2.5%) case. There was no mortality found among the patients.

Conclusion: In the treatment of gallbladder disease, laparoscopic cholecystectomy has become the gold standard technique. However, due to the high rate of bile duct injuries, special care must be taken. Extra-biliary complications are far more common than biliary complications and can be fatal. To avoid significant morbidity and mortality in these patients, an early diagnosis and a high level of suspicion combined with sound clinical judgment are essential.

Keywords: Laparoscopic cholecystectomy (LC), Cholecystitis, Biliary complications

INTRODUCTION

Laparoscopic cholecystectomy was introduced in the nineties as a new surgical technique adopted by general surgeons (80%) especially in France and USA [1]. In the USA, approximately 500,000 to 700,000 patients have laparoscopic cholecystectomy each year [2]. Laparoscopic cholecystectomy is being preferred over open cholecystectomies due to reduced postoperative morbidity, shorter hospital stay, and quick recovery [3, 4]. Regardless of beneficial results, most of the studies reported that biliary tract injuries were common in laparoscopic cholecystectomy as compared to open cholecystectomy [6, 7]. Additionally, a consistent number of referrals for post-LC-related bile-duct injury (BDI) management was cited as evidence of a consistently high complication rate. Gallstone disease is one of the most common diseases among the general population, with prevalence ranging from 10-15% in different countries [8]. It can be either asymptomatic or symptomatic. Symptoms can be specific, such as pains in the right upper quadrant of the abdomen, or nonspecific, such as nausea and vomiting [9]. The only treatment for gall bladder stones is surgery, and until 1986, this surgery was only performed through open abdominal surgery [10]. The abdominal wall injury is responsible for some of the complications of open gall bladder removal (open cholecystectomy).

Laparoscopic cholecystectomy is a pertinent surgical method for acute cholecystitis even in pregnancy, hernia, and abdominal ascites patients [11]. Although laparoscopic cholecystectomy is preferred over open cholecystectomy due to lower treatment cost, short hospital stay, and quick recovery to routine work. But, both procedures have similar anesthesia-related complications [12]. Furthermore, higher rates of stenosis and bile duct injury are found in laparoscopic cholecystectomy as compared to open cholecystectomy [13]. The present study was conducted with an objective to evaluate the frequency of biliary complications in laparoscopic cholecystectomy.

MATERIALS AND METHODS

This cross-sectional study was carried out on 40 patients with cholecystitis in the department of Surgery, Polyclinic Hospital, Rawalpindi, Pakistan for the duration from November 2020 to June 2021. An informed consent form was taken from each individual. All the symptomatic gallstones disease patients were enrolled irrespective of their age and gender in this study. Ethical approval was taken from the respective hospital ethical review committee. The Laparoscopic cholecystectomy complications were bile duct injuries, cystic artery bleeding, retained biliary stone, bile duct leakage, abdominal pain, and internal bleeding following surgery and mortality. Patients diagnosed with sphincter of Oddi dysfunction, bile

duct stones without synchronized biliary tract injury, and malignant biliary strictures were excluded. Also, patients having any indications other than bile duct injury and converted laparoscopic cholecystectomy to open cholecystectomy were excluded. All the patients who underwent laparoscopic cholecystectomy with biliary complications such as residual leaks, injuries, partial transaction, and strictures were enrolled in this study.

The patient's demographic details such as age, gender, and elapsed time between laparoscopic cholecystectomy procedure and their complications were recorded. Other clinical features such as biliary fistula, abnormal liver chemistries, abdominal pain, biliary ascites, jaundice, and bile peritonitis were recorded in predesigned proforma. Biliary leaks, biliary strictures, right hepatic, biliary leaks with stones, and common-bile duct transactions were the different classifications of Bile-duct injuries. Demographic details and Laparoscopic cholecystectomy complications were analyzed using SPSS version 20.

RESULTS

Of the total 40 cholecystitis patients, the prevalence of female and male patients were 35 (87.5%) and 5 (12.5%) respectively. The overall prevalence of laparoscopic cholecystectomy complications was found in 29 (72.5%) patients. The most prevalent complication was retained stone 13 (32.5%) cases followed by biliary duct leakage and injuries in 7 (17.5%) cases. Cystic artery bleeding was present in 5 (12.5%) cases. Other post-surgery complications were artery cystic bleeding in three (7.5%) cases and abdominal pain in one (2.5%) case. There was no mortality found among the patients. Figure 1 demonstrate the prevalence of male and female patients in the present study. Table 1 and Figure 2 shows the prevalence of complications among 29 patients underwent laparoscopic cholecystectomy. As shown in Figure 3, the nature and incidence of laparoscopic cholecystectomy access complications include subcutaneous emphysema in 2 (5%), port site bleeding 5 (12.5%), port site sepsis 3 (7.5%), and small bowel or ascending colon laceration in none of the patients.

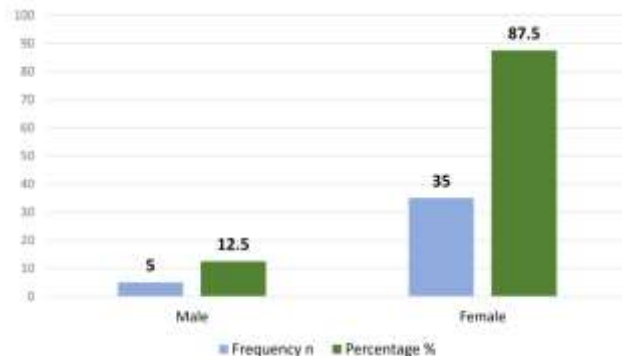


Figure 1. Frequency of Male and Female patients (n=40)

Table 1. Frequency and Percentage of LC complications among 29 patients

Complications	Frequency n	Percentage %
Retained stone	13	32.5
Biliary duct leakage and injuries	7	17.5
Cystic artery bleeding	5	12.5
Post-surgery artery cystic bleeding	3	7.5
Post-surgery abdominal pain	1	2.5

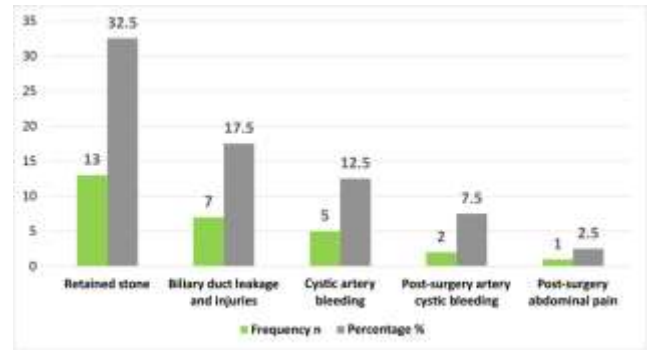


Figure-2 Frequency and Percentage of LC complications among 29 patients

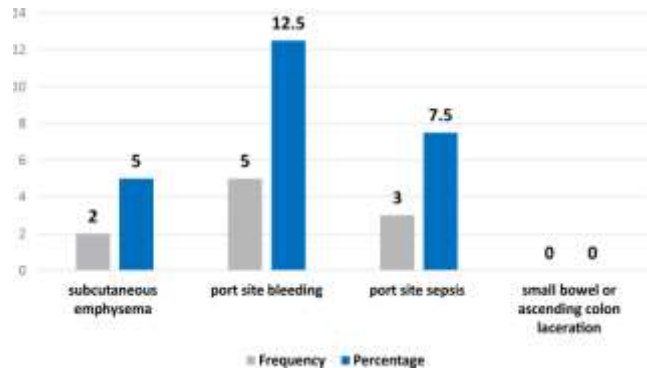


Figure 3. Incidence and nature of LC access complications

DISCUSSION

Laparoscopic cholecystectomy is the preferred elective surgery over open cholecystectomy and was introduced for symptomatic gallbladder disease surgical treatment and management [14]. Recent data shows the lesser morbidity and mortality rate of laparoscopic cholecystectomy unlike the previous report of increased complications rate after LC procedures [15]. In the present study, no mortality case was observed whereas mortality in the previous study was 0.04% [16]. In the present study, 40 patients underwent laparoscopic cholecystectomy with a higher prevalence of female patients compared to male patients. Laparoscopic cholecystectomy complications were divided into two distinct categories namely procedure-related and access complications. LC contributes significantly to emergency care and gastrointestinal surgery-related workflow. Patients' cohorts not only the gallbladder disease natural history but their findings could be astonishing in surgical procedures with variance in ease and difficulties.

The laparoscopic cholecystectomy's most common serious complications are Cholecystitis and bile duct injuries [17]. Based on a comparison between LC and open cholecystectomy, though no significant difference has been observed in the bile duct injury rate LC procedures had higher injuries complications with a variant rate from LC 1% to open cholecystectomy 0.5% [18]. The prevalence of bile duct injury rate was 17.5% in the present study which is higher than found in a similar study given range from 0.25% to 1.7% range [19]. Regarding gender relevance to the injury rate, higher incidence LC complications were reported in female patients. However, another study found a higher prevalence of bile duct injuries in male patients compared to females [20]. The rate of choleperitonitis and bile leakage was higher in laparoscopic cholecystectomy but found rare in open cholecystectomy. Wood et al. found bile leakage in 50% of cases after laparoscopic cholecystectomy [21]. In the present study, a bile leak was found in 7 cases. Cystic artery bleeding and post-surgery Cystic artery bleeding was found in 5 and 2 cases respectively. All the patients were diagnosed and repaired during the surgical procedures and most of these patients quickly recovered to routine conditions. Yet, Hamazaki et al. found 0.2% bile duct injuries and bleeding rate 14% which was lower than our findings [22].

Loffler and Pent et al. reported complication rate in the closed technique of LC varied from 0.2% to 0.3% [23]. In contrast, the open procedure has shown promising results in reducing the trocar insertion bile duct injuries and mortality rate. Avascular planes provide a vision for trocar insertion and port site bleeding reduced through ports inspection before abdomen deflation. Bowel injury might be caused by the first trocar insertion thrust force as recommended by a previous study [24]. The safe procedure can be performed using the telescope for abdominal wall illumination which displays all the secondary ports and vessels. Trocar insertion site gas leakage usually leads to subcutaneous emphysema and mostly happens in obese patients where misdirected veress needle because of insufflated gases. Like other studies, gas might be evacuated from the abdominal wall through the application of manual pressure [25].

The incidence of LC complications is more difficult compared to peritoneal cavity gallstone's grasping and extraction which in turn prolongs the operational procedures as reported in a similar study [26]. In post-surgery complications, port side sepsis was found in 3 cases which resemble the study conducted by Lee et al. [27]. The infrequent port side infection is a troublesome complication that minimizes the invasive surgery benefits. Safe outcomes and mortality prevention could be possible if port site infection is early identified and managed properly. A patient presenting clinical symptoms with bile duct injury gives the most common complaint of abdominal pain. In order to mitigate the complications of laparoscopic cholecystectomy relevant to the biliary injuries, no standard approach was proposed. A high-quality contrast-enhanced helical CT is preferred to confirm the leak and identify associated noncontiguous bile collections or abscesses that may require additional catheter drainage. Percutaneous transhepatic cholangiography remains a

useful tool in these complex patients for both defining the biliary injury and obtaining proximal control of a biliary fistula [28].

CONCLUSION

In the treatment of gallbladder disease, laparoscopic cholecystectomy has become the gold standard technique. However, due to the high rate of bile duct injuries, special care must be taken. Extra-biliary complications are far more common than biliary complications and can be fatal. To avoid significant morbidity and mortality in these patients, an early diagnosis and a high level of suspicion combined with sound clinical judgment are essential.

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