International Journal of Life Sciences, Biotechnology and Pharma Research Vol. 13, No. 10, October 2024 Online ISSN: 2250-3137
Print ISSN: 2977-0122

DOI: 10.69605/ijlbpr_13.10.2024.145

ORIGINAL RESEARCH

Complications of Laparoscopic cholecystectomy

Dr. Harshit Arora

Junior Resident, Department of General Surgery, Govt Medical College & Hospital, Amritsar, Punjab, India

Corresponding Author
Dr. Harshit Arora
Junior Resident, Department of General Surgery, Govt Medical College & Hospital, Amritsar, Punjab, India

Received Date: 23 August, 2024 Accepted Date: 28 September, 2024

ABSTRACT

Aim- To assess the frequency and types of intraoperative and postoperative complications associated with laparoscopic cholecystectomy, along with the rate of conversions to open surgery. **Materials and methods-** Medical records of 100 patients diagnosed with cholelithiasis who underwent laparoscopic cholecystectomy were analysed. The analysis reviewed operative protocols, anesthesiology records, medical histories, laboratory findings, and imaging results to assess the types and frequencies of intraoperative and postoperative complications. Key factors evaluated included demographics such as age, gender, along with preoperative ultrasonographic and pathohistological findings of the gallbladders. Data analysis was done using SSPS software. **Results-** Out of the 100 patients in the study, 52 were female (52%) and 48 were male (48%). The median age was 42 years, including participants that were 18-60 year old. There were 33 patients (33.3%) with intraoperative complications (IOC). The most common complications noted were: iatrogenic perforations of the gallbladder-13 (13%). Postoperative complications (POC) were observed in 45 patients, accounting for 45% of the cohort. The most prevalent complications included bleeding from the abdominal cavity exceeding 100 ml in 12 patients (12%) and bile leaks through drainage amounts ranging from 50-100 ml in 15 patients (15%). Other less common complications comprised surgical wound infections in 2 patients (2%) and incisional hernias at the port site in 4 patients (4%). **Conclusion-** Our study highlights the significant incidence of intraoperative and postoperative complications in laparoscopic cholecystectomy, though the smaller sample size may limit generalizability. Larger studies are needed to provide more accurate data and improve patient outcomes through refined surgical techniques and better risk management.

Keywords- cholecystectomy, cholecystitis, laparoscopic

INTRODUCTION

Laparoscopic cholecystectomy is a minimally invasive surgical procedure for removal of a diseased gallbladder. This technique essentially has replaced the open technique for routine cholecystectomies since the early 1990s[1]. At this time, laparoscopic cholecystectomy is indicated for the treatment of cholecystitis (acute/chronic), symptomatic cholelithiasis, biliary dyskinesia, acalculous cholecystitis, gallstone pancreatitis, and gallbladder masses/polyps[2]. These indications are the same for an open cholecystectomy. Cases of gallbladder cancers are usually best treated with open cholecystectomy. Approximately 20 million people in the United States have gallstones. Of these people, there are approximately 300,000 cholecystectomies performed annually. Ten percent to 15% of the population has asymptomatic gallstones. Of these, 20% are symptomatic (biliary colic). Of the 20% who are symptomatic approximately 1% to 4% will manifest complications (acute cholecystitis, gallstone pancreatitis, choledocholithiasis, gallstone ileus). The incidence of gallstones increases with an increase in age, with females more likely to form gallstones than males. Age 50 to 65 approximately 20% of women and 5% of men have gallstones. Overall, 75% of gallstones are composed of cholesterol, and the other 25% are pigmented[3,4]. Despite the composition of gallstones the clinical signs and symptoms are the same.

Timely and accurate identification of post-cholecystectomy complications is crucial, as it can significantly influence patient outcomes, reducing the morbidity associated with delayed diagnosis and treatment [5,6]. Imaging is an indispensable tool providing a non-invasive means of differentiating between normal postoperative anatomy and pathology. Based on the indication, ultrasound and computed tomography (CT) are the primary imaging modalities used to evaluate postsurgical complications. CT is essential for the diagnosis of vascular complications. Magnetic resonance cholangiopancreatography (MRCP) is the imaging modality of choice for evaluating the biliary tree. Bile

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leak can be diagnosed on a radionuclide scan or on magnetic resonance imaging using hepatobiliary-specific contrast agents [7]. Hence the study aimed to assess the frequency and types of intraoperative and postoperative complications associated with laparoscopic cholecystectomy, along with the rate of conversions to open surgery.

MATERIALS AND METHODS

Medical records of 100 patients diagnosed with cholelithiasis who underwent laparoscopic cholecystectomy were analysed. The analysis reviewed operative protocols, anesthesiology records, medical histories, laboratory findings, and imaging results to assess the types and frequencies of intraoperative and postoperative complications. Key factors evaluated included demographics such as age, gender, along with preoperative ultrasonographic and pathohistological findings of the gallbladders. All surgeries employed a standard four-port technique, and the study aimed to identify factors influencing complication rates, including causes and rates of surgical conversions. Data analysis was done using SSPS software.

RESULTS

Out of the 100 patients in the study, 52 were female (52%) and 48 were male (48%). The median age was 42 years, including participants that were 18-60 year old.

There were 33 patients (33.3%) with intraoperative complications (IOC) (Table 1). The most common complications noted were: iatrogenic perforations of the gallbladder- 13 (13%), bleeding from the tissues adjacent to the gallbladder 11 (11%), gallstones spilt into the peritoneal cavity 2 (2%). Intraoperative bleeding from the cystic artery occurred in 3 (3%) and bleeding from the port in 3 patients (3%) .

Table 1: Intraoperative complications (IOC)

Type of Complication	Number of Cases	Percentage (%)
Bleeding from tissues adjacent to gallbladder	11	11
Injuries to the common bile duct	1	1
Bleeding from cystic artery	3	3
Bleeding from the abdominal wall (port)	3	3
Iatrogenic perforations of the gallbladder	13	13
Spilled gallstones	2	2

Table 2: Postoperative complications (POC)

Type of Complication	Number of Cases	Percentage (%)
Bleeding from abdominal cavity (>100 ml/24h)	12	12
Bile leaks (>50-100 ml/24h)	15	15
Subhepatic collection	1	1
Surgical wound infection	2	2
Incisional hernia	4	4
Hematoma of the abdominal wall	6	6
Gallbladder carcinoma	2	2
Lost gallstones (abscess)	3	3

Postoperative complications (POC) were observed in 45 patients, accounting for 45% of the cohort. The most prevalent complications included bleeding from the abdominal cavity exceeding 100 ml in 12 patients (12%) and bile leaks through drainage amounts ranging from 50-100 ml in 15 patients (15%). Other less common complications comprised surgical wound infections in 2 patients (2%) and incisional hernias at the port site in 4 patients (4%). Additionally, Hematomas around the working port were noted in 6 patients (6%). Furthermore, pathohistological analysis confirmed gallbladder carcinoma in 2 patients (2%).

DISCUSSION

Laparoscopic cholecystectomy, a minimally invasive procedure to remove the gallbladder, is a common treatment for conditions like gallstones and gallbladder inflammation. While its generally safe and effective, the procedure carries a risk of complications. These complications range from mild to severe, with the most common issues being bleeding from the surgical site or tissues around the gallbladder, bile leaks, and infections at the port sites. In some cases, patients may also experience retained gallstones, which can lead to abscess formation, or hernias at the incision points[9,10].

More serious complications, though rare, include injuries to the common bile duct, which can result in bile leakage and infection, requiring further surgical intervention. There is also the potential for injury to nearby organs such as the liver or intestines. Proper technique during surgery and careful postoperative monitoring can help identify and manage these complications early, ensuring better patient outcomes. Despite these risks, laparoscopic cholecystectomy remains the preferred approach for most gallbladder-

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related issues due to its minimally invasive nature and quicker recovery time[11,12].

In our study out of the 100 patients in the study there were 33 patients (33.3%) with intraoperative complications (IOC).The most common complications noted were: iatrogenic perforations of the gallbladder-13 (13%), bleeding from the tissues adjacent to the gallbladder 11 (11%), gallstones spilt into the peritoneal cavity 2 (2%). Intraoperative bleeding from the cystic artery occurred in 3 (3%) and bleeding from the port in 3 patients (3%). Postoperative complications (POC) were observed in 45 patients, accounting for 45% of the cohort. The most prevalent complications included bleeding from the abdominal cavity exceeding 100 ml in 12 patients (12%) and bile leaks in 15 patients (15%). Other less common complications comprised surgical wound infections in 2 patients (2%) and incisional hernias at the port site in 4 patients (4%).

Where as in study done by Radunovic M et al.2016 [13]with a sample size of 740 patients,it was seen thatthere were 97 (13.1%) intraoperative complications (IOC). Iatrogenic perforations of a gallbladder were the most common complication - 39 patients (5.27%). Among the postoperative complications (POC), the most common ones were bleeding from abdominal cavity 27 (3.64%), biliary duct leaks 14 (1.89%), and infection of the surgical wound 7 patients (0.94%).

A key limitation of our study is the smaller sample size of 100 patients compared to the study by Radunovic M et al., which included 740 patients. The smaller cohort may reduce the generalizability and statistical power of our findings, potentially leading to less accurate representations of the incidence of complications. For instance, while our study observed higher rates of certain intraoperative and postoperative complications, such as iatrogenic perforations (13% vs. 5.27%) and bile leaks (15% vs. 1.89%), these discrepancies could be attributed to the limited number of cases. To improve the reliability and validity of our results, future research should aim to include a larger, more diverse patient population. This would allow for more robust comparisons and a clearer understanding of the true rates of complications associated with laparoscopic cholecystectomy.

CONCLUSION

In conclusion, our study highlights the significant incidence of intraoperative and postoperative complications in laparoscopic cholecystectomy, though the smaller sample size may limit generalizability. Larger studies are needed to provide more accurate data and improve patient outcomes through refined surgical techniques and better risk management.

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