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Incidence of Intraoperative and Postoperative Complications Among Patients Undergoing Laparoscopic Cholecystectomy: A Retrospective Analysis from a Tertiary Care Hospital

Himansu Shekhar Mishra *[1], Girija Sankar Naik [2], Bismaya Kumar Rout [3]

[1]Assistant Professor, Department of Surgery, SCB Medical College and Hospital, Cuttack, Odisha, India.
[2]Associate Professor, Department of Surgery, DRIEMS Institute of Health Science and Hospital, Cuttack, Odisha, India.
[3]Assistant Professor, Department of Surgery, Shri Jagannath Medical College and Hospital, Puri, Odisha, India.

*Corresponding Author: Dr. Himansu Shekhar Mishra; *himansumishra83@gmail.com*

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Abstract

Background: Laparoscopic cholecystectomy is a prevalent surgical intervention for gallbladder pathologies. However, its adoption introduced a novel profile of intraoperative and postoperative complications in conditions like symptomatic cholelithiasis and cholecystitis. This study aimed to evaluate the spectrum and incidence of these complications in patients undergoing laparoscopic cholecystectomy. ***Methods:*** A retrospective analysis was conducted on 100 patients who underwent laparoscopic cholecystectomy at the Department of Surgery, SCB Medical College and Hospital, Cuttack, between December 2022 and December 2023. Intraoperative and postoperative complications were extracted from patient records following informed consent. ***Results:*** The majority of patients (30%) were aged 40-60 years (mean age 50.6 ± 8.1 years), with a predominance of females (59%). The mean body mass index was 23.33 ± 2.26 kg/m². Pre-existing comorbidities included smoking (21%), diabetes mellitus (19%), and hypertension (11%). The mean operative time was 50.25 ± 4.75 minutes. Symptomatic gallstones were the primary indication for surgery (56%). The most frequent intraoperative complication was trocar site bleeding (8%), while surgical site infection was the most common postoperative complication (5%). ***Conclusions:*** Despite the occurrence of some intraoperative and postoperative complications, laparoscopic cholecystectomy demonstrates low mortality and morbidity rates, establishing it as a safe procedure with favorable outcomes for the management of gallbladder diseases.

Keywords: ***Intraoperative and postoperative complications, Laparoscopic cholecystectomy.***

Introduction

The benign gallbladder illnesses with the most widespread clinical recognition are cholelithiasis and cholecystitis [1]. The most crucial kind of therapy is surgery [2] Laparoscopic surgery has grown in importance as a method of surgery thanks to the development of minimally invasive concepts and technology [3]. The first laparoscopic cholecystectomy in humans is widely ascribed to Mouret in 1987, who drew on his background in gynecological procedures and appendicectomy [4].

For symptomatic cholelithiasis, laparoscopic cholecystectomy has become the dominant surgical approach, with an increasing number of procedures performed for acute cholecystitis [5-9]. While open cholecystectomy historically presented a low incidence of bile duct injury, the widespread adoption of laparoscopy was initially associated with bile duct injury rates as high as 5% [10]. Despite the extensive utilization of laparoscopic cholecystectomy (approximately 750,000 cases, ~90% of all cholecystectomies in the US by 2007) and increasing surgeon experience, the significant complication rate remains elevated compared to open surgery [11,12]. Concurrently, the complication rate of open cholecystectomy has also risen, likely due to a decline in surgeon proficiency and its reserved application for complex cases [13]. Serious complications associated with laparoscopic cholecystectomy include bile duct injury, bile leakage, hemorrhage, and intestinal damage, potentially attributable to patient selection biases, inadequate surgical expertise, and inherent limitations of the minimally invasive technique [12,14-18].

Diathermy-induced thermal lesions, frequently involving the right or common hepatic ducts and prone to delayed recognition, constitute a major source of biliary ductal injury. The interplay of this iatrogenic risk with the natural inflammatory and fibrotic processes associated with biliary disease underscores the importance of intraoperative "stop rules." Therefore, timely conversion to open surgery is a necessary strategy when safe laparoscopic dissection cannot be achieved [19,20]. Intraoperative and early postoperative complications are unavoidable considerations.

The expanding application of gallbladder surgery has been accompanied by a corresponding evolution in the spectrum of associated complications [21]. However, increased surgeon

proficiency, the widespread adoption of the technique, and advancements in surgical instrumentation have contributed to a reduction in the incidence of intraoperative complications, including bowel and vascular injury (related to trocar insertion), biliary leakage, and bile duct injuries [22].

Existing prospective studies estimate the total morbidity and mortality associated with laparoscopic cholecystectomy to range from 2-6% and 0.1-0.5%, respectively [23-25]. However, limited data exist regarding the specific intraoperative and postoperative complications. Therefore, this study prospectively evaluated the incidence of these complications in patients undergoing laparoscopic cholecystectomy.

Methods

This retrospective observational study, conducted within the Department of Surgery at SCB Medical College and Hospital, Cuttack, between December 2022 and December 2023, analyzed intraoperative and postoperative complications in a cohort of 100 patients who underwent laparoscopic cholecystectomy. Data on complications were extracted from patient records following informed consent from patients or their guardians. The collected data underwent verification and cleaning prior to entry into a computerized database. Statistical analysis was performed using SPSS version 22. Descriptive statistics, including means and standard deviations for continuous variables and frequencies with percentages for categorical variables, 1 were employed for data summarization and presentation in tables, figures, and charts as appropriate.

Inclusion criteria

All age groups, patients undergoing laparoscopic cholecystectomy.

Exclusion criteria

Patients undergoing open cholecystectomy, patients transferred to another hospital.

Results

This study enrolled 100 patients undergoing laparoscopic cholecystectomy. The cohort comprised predominantly female individuals (59%), with a mean body mass index of 23.33 ± 2.26 kg/m². Within the study population, 21% reported a history of smoking, 19% had a diagnosis of diabetes mellitus, and 11% had hypertension. The mean operative duration was 50.25 ± 4.75 minutes.

The primary indication for laparoscopic cholecystectomy in this cohort was symptomatic cholelithiasis (56%). Intraoperative complications were observed in a subset of patients (Table 3), including trocar site bleeding (8%), liver bed injury (7%), bile leakage from the gallbladder (5%), bleeding from Calot's triangle (2%), and bile duct injury (2%).

Postoperative complications were also documented. Surgical site infection occurred in 5% of patients, jaundice in 4%, biliary peritonitis in 3%, intra-abdominal fluid collections in 2%, bile leakage in 1%, and fecal peritonitis in 1%. No mortality was recorded in this study.

Discussion

This current study was conducted to assess the intraoperative and postoperative complications of patients undergoing laparoscopic cholecystectomy. Total 100 patients undergoing laparoscopic cholecystectomy were included in this study. Majority of the study people (30%) were in the age group of 52-60 years. Mean age of the study people was 50.6 ± 8.1 years. Majority of the study people (59%) ware female. Which indicates that women are more prone to gallbladder diseases? In the study of Giger et al, among 22,953 patients mean ± SD age was 54.5 ± 16.1 years and most of the study people were female (68.6%) which is similar to our study [26]. Mean BMI of the study people was 23.33 ± 2.26 kg/m^2 in our study. In the study of Yang et al, among 144 study people, mean ± SD BMI was 22.83 ± 2.15 kg/m^2 in research group and 22.36 ± 2.23 kg/m^2 in control group [27]. In this study, 21% study people had smoking habit, 19% had diabetes, and 11% had hypertension. In the study of Yang et al, in research group 47.37% had smoking habit, 17.11% had diabetes, and 27.63% had hypertension [27]. In control group, 36.76% had smoking habit, 16.18% had diabetes, and 23.53% had hypertension.

In this study, mean operation time was 50.25±4.75 minutes. In the study of Yang et al mean ±SD operation time in research group was 48.32±3.84 minutes and mean ±SD operation time in control group was 49.07±3.42 minutes [27]. The commonest indication of laparoscopic cholecystectomy was symptomatic gallstones (56%) in our study. In the study of Z'graggen et al, symptomatic gallstones was also the commonest (87.9%) indication of laparoscopic cholecystectomy [28]. In this study, the commonest intraoperative complications was trocar site bleeding (8%), followed by 7% had liver bed injury, 5% had bile leakage from GB, 2% had bleeding from calots, 2% had bile duct injury.

Familiar results were found in the study of Agarwal et al where the most frequent intraoperative complication was trocar site bleeding and liver bed injury, 7%, followed by bile leakage from gallbladder 6%, bleeding from calots triangle in 4% and spilled gallstones in 2% cases [29]. In this study, the commonest postoperative complications was surgical site infection (5%), followed by 4% had jaundice, 3% had biliary peritonitis, 2% had intra-abdominal collections, 1% had bile leakage, and 1% had fecal peritonitis and no death record. Amreek et al found similar results where most common postoperative complication was surgical site infection (2.7%), followed by 0.9% had jaundice, 0.8% had biliary peritonitis, 0.6% had intra-abdominal collections, 0.4% had bile leakage, 0.3% had fecal peritonitis and 0.1% had retained CBD stones [30].

In our study, there was small sample size and absence of control for comparison. Study population was selected from one center, so may not represent wider population. The study was conducted at a short period of time. The sampling was retrospective and there was no random allocation, so there was risk of selection bias.

Conclusion

Despite a low incidence of intraoperative and postoperative complications, laparoscopic cholecystectomy demonstrates a favorable safety profile characterized by low mortality and morbidity rates. However, studies with larger cohorts are warranted to enhance the statistical power and refine our understanding of its outcomes.

Declarations

Ethical Approval and Consent to participate

Not applicable as retrospective nature of study. Consent for publication: Not applicable as retrospective nature of study.

Availability of supporting data

Upon request to the corresponding author.

Competing interests

Nil

Funding Statement

Nil

Authors contributions

All authors made substantial contributions to the reported work, including in the areas of conception, study design, execution, data collection, analysis, and interpretation. They participated in drafting, revising, and critically reviewing the article, gave final approval for the version to be published, agreed on the journal for submission, and accepted responsibility for all aspects of the work.

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