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Original Research Article

Experience with Bile Duct Damage after Laparoscopic Cholecystectomy from a Tertiary Care Facility

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Abstract

Introduction: A frequent illness is bile duct stones. In the United States, over 750,000 cholecystectomies are carried out each year, and approximately 30 million people suffer from bile duct stone disease. The study's goal is to understand the risks, prevalence, kinds, causes, timing, clinical manifestations, various imaging modalities, and therapeutic approaches for BDIs.

Method: At LSK Hospital in Kishanganj, 110 patients participated in an observational study. We monitored and followed up on every patient who underwent laparoscopic cholecystectomy with BDIs. The investigation lasted for a full year. All BDI cases from September 1, 2020 to October 31, 2021 were included. Ahead of time, the Institutional Ethics Committee gave its consent. Before taking part in the trial, each patient provided written informed consent.

Results: During the course of the trial, 110 patients in all were observed. These patients were primarily female and had a mean age of 43.7 ±18.1 years. Eleven instances required the change of laparoscopy to open surgery. This procedure was carried out due to BDI in 8 cases and due to a short cystic duct with adhesions, irritation, and difficulty during laparoscopy in 2 cases. In 4 patients, BDI was noted, and in 3 more, BL took place. Three of the four cases of BDI were discovered intraoperatively, and two were discovered postoperatively. End-to-end anastomosis over a T-tube and Roux-en-Y hepaticojejunostomy were used to surgically treat the cases that were discovered at the time of surgery.

Conclusion: Long-term follow-up for such patients should be performed, and the surgeon doing the laparoscopic cholecystectomy should be knowledgeable about the care of such injuries.

Keywords: Bile Duct Injury, Laparoscopic Cholecystectomy.

Introduction

A frequent illness is bile duct stones. In the United States, around 750,000 cholecystectomies are performed each year, and over 30 million people suffer from bile duct stone disease [1]. The only surgical option for treating gallbladder stones up until the advent of laparoscopy has transformed the situation, and today the majority of such surgeries are performed by laparoscopic cholecystectomies [2]. Bile duct injury (BDI) incidences increased along with the use of laparoscopic surgery more frequently, and there is a clear upward trend in these injuries following the use of laparoscopic surgery over open cholecystectomies[3,4].

Bile duct leaks and BDI situations require a multidisciplinary team of trained surgeons to manage effectively. These injuries may result in substantial morbidity and mortality if the physician is unskilled and the surgical facilities are subpar [5].

According to a study, the postoperative morbidity and death rates for large BDIs were 5.5% and 25%, respectively [6]. Because the laparoscopic approach will be used more frequently in the next years, particularly in a developing nation like India where surgeons are still in the first stages of training in laparoscopic methods, complications of laparoscopic cholecystectomy should be of concern. Unfortunately, there is a lack of information regarding the prognosis of such injuries, the methods for correcting such injuries, etc. in patients from India.

The objective of this study is to understand the risks, prevalence, kinds, causes, timing, clinical manifestations, imaging modalities, and therapeutic approaches for BDIs.

Method

At LSK Hospital in Kishanganj, 110 patients were the subject of observational research. All patients who received BDI-assisted laparoscopic cholecystectomy were monitored and followed up. An entire year was spent doing the study. Included all cases of BDI from September 1, 2020 to October 31, 2021. The Institutional Ethics Committee had previously given its blessing. Each patient gave their written consent after being fully informed about the study before enrolling.

The four-port technique was used to conduct laparoscopic cholecystectomy on all of the patients. A conventional approach was used to accomplish the cholecystectomy. An assistant professor or someone of a higher rank performed all procedures. Ultrasonography (USG), computed tomography (CT), endoscopic retrograde cholangiopancreatography (ERCP), magnetic resonance cholangiopancreatography (MRCP), and T-tube cholangiogram were imaging modalities used to diagnose, identify level, and monitor cases of BDI and bile leak (BL).

Two groups of patients were created: BDI and BL. In a predesigned pro forma, information on sociodemographic traits and other criteria were noted.

Microsoft Excel was used to examine all the data that was gathered. Frequency and percentages have been used to report descriptive statistics.

Results

During the course of the study, 110 patients in all were observed. The average age of these patients was 43.7±18.1 years, and the majority of them were female. The majority of the patients were between the ages of four and five. The most frequent presenting complaints were nausea and vomiting as

well as right hypochondriac discomfort. The mistaken identification of CBD as a cystic duct was the most frequent cause of BDI.

Eleven cases required the change of laparoscopy to open surgery. This procedure was carried out due to BDI in 8 cases and due to a short cystic duct with adhesions, irritation, and difficulty during laparoscopy in 2 cases. In 4 patients, BDI was noted, and in 3 more, BL took place. Four cases of BDI were found intraoperatively, and two cases were found postoperatively. End-to-end anastomosis over a T-tube and Roux-en-Y hepaticojejunostomy were used to surgically treat the cases that were discovered at the time of surgery. Abdominal pain, fever, jaundice, and elevated alkaline phosphatase and blood bilirubin levels were typical BDI signs and symptoms [Table 1].

Table 1: Distribution of patients based on characteristics of BDI

Characteristics of BDI	Number of Patients
Types of BDI	
CBD- Full Thickness	2
CBD- Partial Thickness	2
Bile Leak	3
Cystic duct leak	2
Clinical feature of BDI	
Abdominal pain	6
Deranged LFT	5
Fever	5
Jaundice	5
Abdominal distension	1

USG abdomen was the first imaging technique to identify BDI and BL because it reveals intrahepatic biliary radical dilation and sub-hepatic collection on the tenth postoperative day, a T-tube cholangiogram was performed on a patient who had end-to-end anastomosis repair over a T-tube. T-tube removal was done if there was even a little amount of anastomotic leakage and the biliary tree was clearly visible. To define the biliary anatomy and determine the severity of the injury, ERCP was performed. Patients who had common bile duct partial thickness injuries underwent ERCP with stenting (CBD). A CT scan was performed to determine the degree of obstruction, the scope of the damage, and the full amount of the damage.

In our study, we used end-to-end anastomosis over a T-tube repair using Vicryl 3-0 sutures with a follow-up T-tube cholangiogram after 10 days to treat instances that demonstrated CBD injury during the perioperative phase. An additional case under Roux-en Y hepaticojejunostomy management. All three cases in which BL was discovered through abdominal drains were treated conservatively and with straightforward drainage. The postoperatively discovered patient was treated with ERCP and a stent (Table 2). There was no evidence of mortality.

Table 2: Cases are distributed according to their diagnostic method and mode of therapy.

Management of Cause	Number
Diagnosis	
USG	8
MRCP	5
T-tube cholangogram	3
ERCP	2
CT Scan	2
Treatment	
Conservative	3
End-to-End anastomosis over a T-Tube	2
Roux-en Y hepaticojejunostony	2
ERCP with Stent	2

Discussion

Understanding the nature, treatment, and prognosis of BDI and bile duct leak following laparoscopic cholecystectomy was the goal of this observational study. 8% of the 110 individuals who underwent the procedure and were tracked had BDI/leaks. When compared to other other trials that have been published with comparable goals, this incidence of BDI and leak is considerable. The BDI was reported to be just 0.59% in a research based on 1,522 laparoscopic cholecystectomies in Thailand [7]. Similar incidences of BDIs were identified in numerous additional investigations [8–10].

Misinterpretation of the bile duct's structure is the primary cause of these injuries. Injury risk decreases as surgeons gain experience. The majority of these injuries are not discovered during surgery, but in our analysis, 50% of the injuries were discovered and treated there, thus there was no discernible impact on mortality. It is important to note that such injuries have a significant financial impact and lower patient quality of life. Significant morbidity and mortality may result from BDIs and leaks [11].

All BDIs in this trial were fixed, and there was no mortality. These results are superior to those of prior studies where some mortality was noted. Postoperative mortality was reported to be 2.7% in a review of 15 studies [7]. A study from 1982 found that the death rate was substantially higher (i.e., 8.6%) [12]. It appears that the surgical outcomes for BDIs are getting better with time. In this investigation, biliary leaks were seen in about half of the injury patients. [13]

The pressure on the sphincter of Oddi, which causes the leakage of bile from vessels outside, is blamed for this leak. The surgical care and investigations performed in this study were comparable to those in related published studies [14].

Conclusion

Comparatively, BDI incidences have declined. Long-term follow-up for such patients should be performed, and the surgeon doing the laparoscopic cholecystectomy should be knowledgeable on the care of such injuries.

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