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Posterior-First Dissection in Laparoscopic Cholecystectomy: Impact on Bile Duct Injury Rates

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Abstract: **Background**: Laparoscopic cholecystectomy is considered one of the most common interventional procedures in surgery globally. Despite being generally safe with minimal operative and postoperative complications, it carries a risk of a serious complication, which is bile duct injury. Research is still ongoing to evolve surgical maneuvers to decrease the incidence of bile duct injury. **Aim of the study**: This study aimed to assess the risk of biliary tract injury in laparoscopic cholecystectomy while using posterior first dissection with blunt dissection using Lahey. **Methods**: This retrospective study included 100 patients admitted for laparoscopic cholecystectomy. All cases operated upon were complicated conditions like acute calculus cholecystitis, empyema of gall bladder or mucocele of gall bladder. The surgical approach was using posterior first dissection in laparoscopic cholecystectomy with blunt dissection using Lahey to release the adhesions and safe dissection in Calot triangle avoiding injury to biliary tree. **Results**: The current study involved 100 patients (72 females and 28 males). All patients were subjected to laparoscopic cholecystectomy while using posterior first dissection with blunt dissection using Lahey. None of the included patients reported injury to bile duct injury.**Conclusion:** Using posterior initial dissection and blunt dissection with Lahey during laparoscopic cholecystectomy demonstrated to be a safe method for lowering the risk of bile duct damage.

Key Words: Cholecystectomy, Laparoscopy

INTRODUCTION

Worldwide, laparoscopic cholecystectomy is thought to be the most popular surgical laparoscopic procedure. For a number of reasons, it is constantly taking the place of open surgical cholecystectomy [1]. Shorter hospital stays, less surgical and postoperative problems, and a lower financial burden are all linked to laparoscopic cholecystectomy [2]. Although there have been few reported complications with laparoscopic cholecystectomy, bile duct damage continues to be a significant and dangerous risk. It has been found that 0.3–0.7% of laparoscopic cholecystectomy instances result in bile duct damage [3]. Despite low incidence, the sequel of this complication makes it a major surgical concern as it could lead to biliary strictures, recurrent cholangitis, and secondary biliary cirrhosis [4].

Most injuries occur during Calot's triangle dissection, frequently as a result of misidentifying the right hepatic or common bile duct as the cystic duct [5]. Primary careful dissection as a "Critical View of Safety" to enable clear identification of the cystic duct and artery prior to division is one surgical procedure that has been shown to reduce the incidence of biliary system injury [6]. Furthermore, early injury diagnosis and anatomy identification can be facilitated by intraoperative cholangiography [7].

Although the study's goal is therapeutically useful, it is vague and does not define primary and secondary outcomes. Without sufficiently addressing other significant consequences, the manuscript primarily concentrates on bile duct injuries. The goals ought to be stated with greater precision and clarity.

METHODS

This retrospective study included data of 100 patients admitted for suspicion acute calculus cholecystitis in Baghdad, Iraq within the years 2020 to 2025. Basic patients' data including name, age, gender, residence and occupation was recorded. In addition, relevant past medical, surgical and drug history was recorded. General and local clinical examination was performed prior to patients' admission.

Surgical Approach

The procedure started with mobilization of the gallbladder from its posterior peritoneal attachments. After conducting pneumoperitoneum and inserting four trocars, the gallbladder was grasped from the fundus and retracted to expose Calot's triangle. Using a Lahey forceps, blunt dissection was performed along the posterior peritoneal fold of the gallbladder. The posterior peritoneum was incised, and the gallbladder was mobilized from the liver bed in a caudo-cranial direction. This approach aided in defining the anatomical boundaries, reducing the risk of injury of the cystic duct and artery.

Next, use the Lahey forceps once more to dissect the anterior peritoneal fold. We obtained a critical view of safety (CVS) by alternating between anterior and posterior dissection, guaranteeing that only two structures—the cystic artery and cystic duct—enter the gallbladder before being separated and clipped. The gallbladder was then removed via the umbilical port after being separated from the liver bed.

Postoperative Care

Following surgery, patients were monitored for vital signs and potential complications as bleeding, infection, or bile leakage. Analgesics were administered as needed, and oral intake is typically resumed within hours once the patient is stable.

Follow-up

Post-operative follow-up was advised two weeks after discharge, during which wound healing, pain levels, and gastrointestinal function were assessed. Patients were advised to reduce fat content in their diets.

RESULTS

The current study involved 100 patients (72 females and 28 males). Patients age categories are illustrated in Figure 1. The majority of patients (91%) were presented with acute calculus cholecystitis, six patients had mucocele and three patients had empyema (Figure 2).

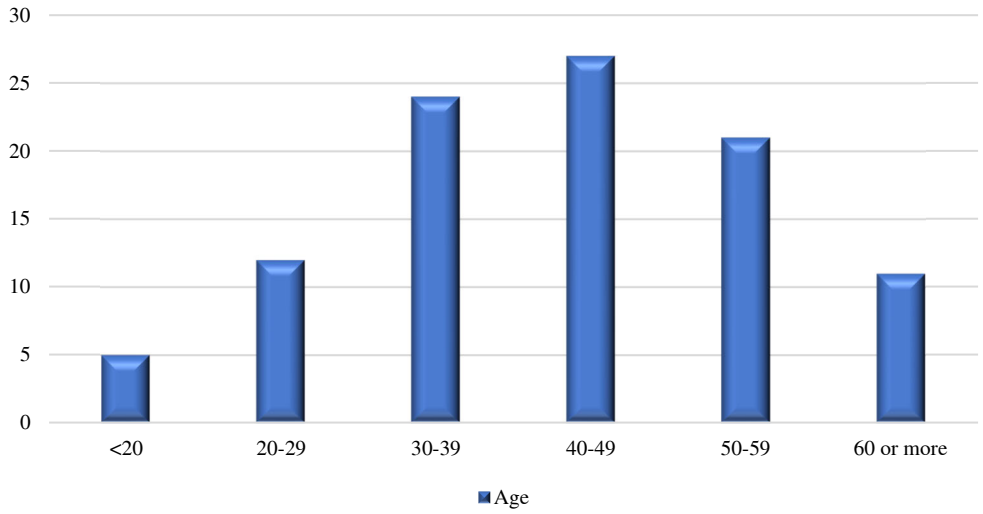

Figure 1: Patients' Age Categories

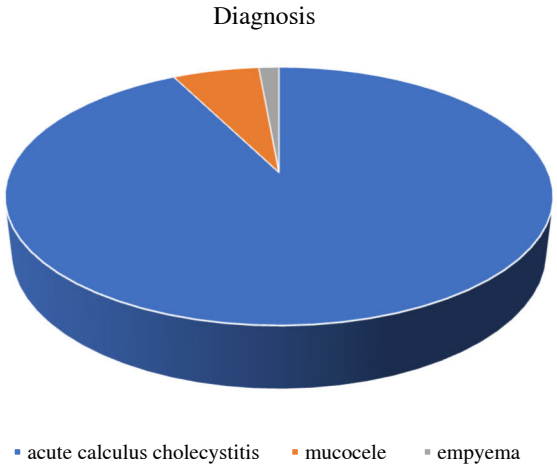

Figure 2: Patients' Presenting Diagnosis

Twenty-one patients had a disease duration of ten days or longer, while 79 patients had a disease duration of less than ten days. Every patient underwent a laparoscopic cholecystectomy using Lahey's posterior initial dissection and blunt dissection technique. Bile duct injuries were not reported by any of the included patients. Regarding the patients' age, length of symptoms, or diagnosis, no statistically significant correlation was found ($p>0.05$).

The study has several limitations, including its retrospective design, relatively small sample size, single-center experience, and limited follow-up duration. In addition, the absence of a control group may affect the generalizability of the findings. These limitations should be clearly acknowledged in the manuscript of "Posterior-First Dissection in Laparoscopic Cholecystectomy: Impact on Bile Duct Injury Rates."

DISCUSSION

In the present study, there was no reports of bile duct injury in all included patients who underwent laparoscopic cholecystectomy using a posterior-first dissection technique with blunt dissection using Lahey forceps. This approach included mobilization of the gallbladder from its posterior peritoneal attachments before dissecting anterior attachments. This technique aided in visualization of Calot's triangle. These finding outlined the safety of the posterior-first blunt dissection method in laparoscopic cholecystectomy.

The absence of bile duct injuries in this study came in agreement with prior studies that reported that posterior-first dissection reduced the risk of misidentification of biliary tree and consequently bile duct injury**.** Elmokadem *et al.*, enrolled 120 patients with symptomatizing chronic calcular cholecystitis who were operated using right posterior approach for dissection of CALOT`s triangle with accomplishing criteria of critical view of safety dissection. The gall bladder was punctured in 4 cases with bile and stones leakage occurred. No recorded cases of major post-operative leak or life threaten morbidities [8].

Iskandar *et al.* conducted a descriptive study to evaluate the posterior infundibular dissection as an initial approach during laparoscopic cholecystectomy [9]. The study included 1402 patients admitted for laparoscopic cholecystectomy. The authors reported that 4 patients had bile leaks that were managed with endoscopic retrograde cholangio-pancreatography (ERCP). Furthermore, no bile duct injuries were reported in that study [9].

Geers *et al.* evaluated the possible beneficial role of posterior infundibular approach as regards incidence, severity, and management of bile duct injury during laparoscopic cholecystectomy [10]. The study enrolled 8389 patients. mortality was minimal as only 14 patients died after laparoscopic cholecystectomy. In addition, 21 patients reported bile duct injury during the procedure, of which 17 (81%) patients were managed through minimally invasive approaches (14 patients through endoscopic approach, 3 patients through laparoscopic approach). Besides, 4 patients were managed via laparotomy (3 hepaticojejunostomy, 1 primary suture). On the other hand, 6 patients reported serious complications post-bile duct injury repair. There was no bile duct injury-related mortality [10].

CONCLUSIONS

Laparoscopic cholecystectomy while using posterior first dissection with blunt dissection using Lahey proved to be a safe approach in decreasing risk of bile duct injury.

Ethical Considerations

This study was approved by the Institutional Review Board of [Department of Surgery, College of Medicine, Mustansiriyah University, Baghdad, Iraq.] (Approval No. 2026-278). Due to the retrospective nature of the study, the requirement for informed consent was waived.

Conflict of Interest

The authors declared no conflict of interest.

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