E-ISSN 2250-0944
ISSN 2250-1150
doi: 10.48047/ijprt/15.02.523

Research Article

The Bile duct injury in laparoscopic cholecystectomy… a study in a tertiary care Centre.

Mohammad Afzal ud din[1], Mohammad Muttahir ud din[2], Abdullah Adam Teroyo[3], Ramanendra Talukdar[4], Ajay Verma[5], Wakeel Ahmed Rather[6]

Mohammad Afzal ud din, Associate professor Department of surgery, Alfalah school of medical sciences
Mohammad Muttahir ud din, Registrar, Govt Medical College Handwara
Abdullah Adam Teroyo, Specialist, Ministry of Health hospital, Oman
Ramanendra Talukdar, Professor surgery, Alfalah school of medical sciences
Ajay Verma, Professor surgery, Alfalah school of medical sciences
Wakeel Ahmed Rather, Resident surgery Alfalah school of medical sciences
Department of general surgery, Alfalah school of medical sciences and research, India
Correspondence: Mohammad Afzal ud din, Associate professor, Department of surgery, Alfalah school of medical sciences and research, India

Abstract

Background: bile duct injury after laparoscopic cholecystectomy has been reported differently in different studies. We aim to study the incidence of this event in our study. Also, we will study the various other parameters of such patients who have biliary in jury.

Methods: a retrospective observational study conducted at our institute. Data was collected from the database to check the record of last 180 operated patients unto September 2025.

Results: most of the procedures where injury occurred were difficult due to inflammation or adhesions. The incidence of injury was 1.8 percent. No mortality was detected. Out of total 4 injuries, 2 were detected during surgery whereas 2 were detected postoperatively.

Conclusion. Bile duct injury is a major complication of laparoscopic cholecystectomy. it has got significant morbidity and mortality. Biliary cripple is the word created to describe such a patient who has low quality of life due to biliary injury. Most of them can be avoided by proper delineation of anatomy operatively.

Key words: biliary injury, laparoscopic cholecystectomy , critical view of safety, severity of acute cholecystitis.

Introduction

All of us know that laparoscopic cholecystectomy is the gold standard for treatment of cholelithiasis. In earlier period when laparoscopic cholecystectomy was still a new procedure, the incidence of bile duct injury was high, but now it is coming down. We aimed to know the present incidence after almost 4 decades of the introduction of this procedure.

Methods.

A retrospective study was conducted in our hospital. Data base was used to check the files of the patients. The last 360 patients who underwent laparoscopic cholecystectomy were selected for study done unto September 2025. After clinical and radiological confirmation of gall stones (with no CBD stone), laparoscopic cholecystectomy was undertaken. Both acute cholecystitis and elective category were studied. All the surgeons who operated were senior surgeons and registrars who have been under the supervision of seniors. Pneumoperitoneum was created by Veress

needle or by open technique. A critical view of safety was tried to be established. It requires firstly that the hepatocyte triangle is cleared of all fat and fibrous tissue. Secondly, it requires that one third of GB is dissected that that portion of cystic plate is exposed. Thirdly, it requires that only two structures are seen to enter the gall bladder. Patients were followed in OPD (outpatient department) the LFT was done regularly.

Results

Out of 180 patients operated 114 (63 percent) were females and 66 were males (36percent). Most common presentation was chronic cholecystitis (63 percent) and second presentation was acute cholecystitis (25 percent) followed by pancreatitis (7 percent). This is shown in table 1. As shown in table 2 the critical view of safety was not achievable in all patients (achievable in only 72 percent).

Diagnosis	Number	Percent
Ch cholecystitis	113	63
Acute cholecystitis	45	25
Biliary pancreatitis	13	7.2
Empyema gall bladder	6	3.2
Gangrene gallbladder	3	1.6
Total	180	100

Table 1 showing the number and percentage of patients showing various diagnosis of gall stones related problems

Critical View of safety done or not	Frequency	Percent
Yes	130	72
No	50	27
Total	180	100

Table 2 showing whether critical view of safety was achieved or not.

Cases converted from lap to open	Number	Percent
Yes, converted	9	5
Not converted	171	95

Table 3 showing number of patients converted from lap to open cholecystectomy

Reason for conversion	Number of cases converted to open cholecystectomy.
Bleeding	7
Adhesions	2
Biliary injury	2
Total	11

Table 4 showing the various reasons for conversion to open cholecystectomy

Biliary injury diagnosing time	Number

During surgery	2
After surgery	2
Total biliary injuries	4

Table 5 showing time when biliary injury was diagnosed

Degree of difficulty as labelled by surgeon	Number	Percent
Mild	45	25
moderate	90	50
Severe	40	22.5
extreme	5	2.5
Total	180	100

Table 6 showing various grades of difficulty as rated by the surgeon

Discussion

Laparoscopic cholecystectomy has become the treatment of choice for symptomatic cholelithiasis. Both mortality and morbidity can be reduced if the injuries are diagnosed early (1).

In 1997 Adamsen etal concluded that the incidence of bile duct injury in laparoscopic cholecystectomy was higher than previously anticipated figure. They suggested that prospective studies were needed to evaluate the risk factors and preventive measures (2). Traditionally morbidity and mortality have been used to evaluate surgery (3) but in laparoscopic cholecystectomy biliary injury is one standard of measurement of outcome. In our case the incidence of injury is 1.8 percent. It is slightly more compared to other modern series like series by Gupta etal (1). Probably the reason for that is that in our hospital specialists (registrars or senior residents) also do a good number of cases . Such cases done by budding (surgeon specialists) under supervision as it is a teaching hospital.

Laparoscopic cholecystectomy was introduced by Erich Muhe and has become the standard now. During the initial years bile injury was more common mainly attributed to surgeons' inexperience and misinterpretation of anatomy (4).

The issue was reviewed by many people including Sodergren etal , and the conclusion was drawn that preoperative assessment of factors is needed in order to avoid complications and guarantee an efficient course of surgery (5). Furthermore, attempts to increase safety resulted in documentation of critical view of safety as described by Strasberg etal(6). In our case the critical view of safety has been established only in 72 percent of cases because it was achievable in only that percentage. This is justified as some difficult cases of acute cholecystitis may not allow one to achieve the critical view of safety but still be safe. This percentage of achieving critical view of safety is the approximately same percentage as discussed in other studies (7).

Furthermore, outcome is affected by presence and severity of inflammation, advancing the age of patient., male sex, greater body mass index (8). Previous abdominal surgery is associated with higher rates of adhesion formation, increased risk of intra-op complications, greater conversion rate, prolonged operating time and longer hospital stay (8). In our case the conversion rate to open surgery is 6 percent, which is acceptable, bleeding being the main reason which is in accordance with literature. But adhesions were also responsible for

conversion to open surgery in 2 cases (less than one third) out of 11 cases.

In cholecystectomy severity of difficult surgery can be assessed by scoring system given by Sugrue etal scoring system (10). In our case the comments by surgeons regarding the difficultness of surgery was labelled as moderately difficult at 90 percent of the time. Probably the reason being that our good chunk of patients is done by specialists as ours being a teaching institution. Also another reason is that our patients survive many attacks of acute cholecystitis before they come for definitive laparoscopic cholecystectomy, as the area is inhabited by an economically weaker section of society. So more pre-op attacks of cholecystitis leads to more inflammation and adhesion formation. We found that biliary injury was detected after surgery most of the time. Whether detected intra-op or in the post-op period, we need to understand its implications for the patient. Biliary cripple is the word used for such a patient who has poor quality of life due to biliary injury (11) so injury should be avoided at all costs. Intraoperative cholangiography can also be done to avoid injury (12). Also, senior surgeons should keep a continuous eye on junior surgeons intraoperatively, if they want to teach them the procedure.

Conclusion

Laparoscopic cholecystectomy has become the treatment of choice for symptomatic cholelithiasis, but biliary injury is a condition which adds morbidity to the patient. Documentation of critical view of safety is an important step in laparoscopic cholecystectomy to reduce the risk of biliary injury. Also, other methods like intraoperative scoring and intraoperative cholangiography can be used to decrease the incidence of biliary injury.

References.

1. Gupta A, Agrawal S, Sharma Namrata, Parth Nukum; Extrahepatic bile duct injury after laparoscopic cholecystectomy ; a retrospective study.; international surgery journal , Aug 2020 ; vol 7(8) 2517-2522
2. Adamsen S, Hansen OH, P Funch, Funch - Jansen P, Schulz S, Stage J G , Wara P. Bile duct injury during laparoscopic cholecystectomy. A prospective nation-wide series. Journal of the American College of Surgeons 1997 June ; 184(6); 571-8
3. Russel EM, Bruce J, K M Kuwoski Z H.; Systematic review of quality of surgical mortality monitoring; British Journal of Surgery; 2003.90, 527-32
4. Huang ZQ, Huang X Q; changing patterns of traumatic bile duct injuries. A review of forty years' experience; world journal of gastroenterology 2002, 8, 5-12
5. Sodergren M., Espina OF , Clark J, Teare J, Yang G, evaluation of orientation strategies in laparoscopic cholecystectomy, Annals of surgery 2010, 252, 1027-36
6. Sanford DE , Strasberg SM, ; A simple effective method for generation of a permanent record of critical view of safety during laparoscopic cholecystectomy by intraoperative doublet photography; Journal of the American college of surgeons,2014; 218, 170-8
7. Stefanidis D, Chintalapudi N, Anderson-Montoya B,, Oommen B, Tobben D, Pimantel M. How often do surgeons obtain the critical view of safety during laparoscopic cholecystectomy? Surg Endosc 2017 jan ;31(1),142-146
8. Kanakala V , Borowski DW, Pellen MG , Dronamraju SS, Woodcock SA ; Risk factors in laparoscopic cholecystectomy , a multivariate analysis, International surgery journal;2011, 9, 318-23
9. Calvete J ,Sabatan L, Camps B, . Bile duct injury during Laparoscopic cholecystectomy , myth or reality of learning curve; Surgical Endoscopy 2000, 14 , 608-11
10. Sugrue M, Sahabelly SM. Ansaloni l, Zielineski MD. Grading operative findings

of laparoscopic cholecystectomy, a new scoring system; World Journal of Emergency Surgery ;2015 March 8. 10;14

11. biliary cripple and spectrum of complications following cholecystectomy; Shrestha AK, Sah JK, Ghimire B, Bhandari A, Shrestha A; a case report; Case reports in surgery, sept 2022,
12. intraoperative cholangiography. A review of indications and analysis of age-sex groups. Levine SB, Lerner HJ, Leifer ED, Lindheim SR; Annals of surgery,1983 Dec;198(6),692-97