

Original Research Article

FREQUENCY OF BILE DUCT INJURY DURING LAPAROSCOPIC CHOLECYSTECTOMY PROCEDURES

ABSTRACT

OBJECTIVE: To determine the frequency of bile duct injury during laparoscopic cholecystectomy procedures.

STUDY DESIGN: This is an observational study.

SETTING: Study carried out at General Surgery department, Shaheed Benazir Bhutto Medical College, Lyari Karachi, from July 2019 to August 2021.

MATERIAL & METHOD: All diagnosed patients of gallstones on the clinically and findings of ultrasound of abdomen with any age, gender were included in study. Patient not willing for surgery, pregnant ladies, bleeding disorders, obstructive jaundice and carcinoma of gall bladder were excluded from this study.

RESULTS: Out of 162 patients, there were 15 males (9.25%) and 147 females (90.74%), with a male to female ratio of 1:11.6. The mean age was 36.01 ± 8.11 years (20 to 60 years). According to our observation, there were 6 cases (3.70%) of common bile duct injury during the operation. Treatments offered range from ERCP and conservative treatment to reconstructive surgery. Four patients (2.46%) were converted to open cholecystectomy, 1 patient underwent open cholecystectomy subsequent ERCP, and 1 patient underwent open Cholecystectomy with Subsequent Reconstructive surgery.

CONCLUSION: In our study common bile duct injury commonly occur during laparoscopic cholecystectomy. Over time, improving surgical technique and experience reduced the overall incidence of CBD injuries.

KEY WORDS: Bile duct injury, Laparoscopic cholecystectomy, Complications.

INTRODUCTION

Worldwide common pathology of gallbladder is cholelithiasis. Gall stones occur in about 10-15% of adults worldwide, and are more common in women¹. Laparoscopic cholecystectomy has fundamentally changed the treatment strategy for patients with cholelithiasis. Due to the minimal pain and disability associated with the procedure, the procedure was quickly accepted as the treatment of choice for most patients with symptomatic stones². Serious complications was observed when common bile duct injury occur during laparoscopic cholecystectomy. Common bile duct injuries are associated with postoperative morbidity and mortality and reduced life expectancy, especially when they go unrecognized³.

In 1891, Sprengel was 1st reported iatrogenic common bile duct injuries, during abdominal interventions, like hepatobiliary, pancreatic, gastric and duodenal surgeries⁴. Historically, bile duct injury in open cholecystectomy has ranged from 0.1% to 0.2%, but with the introduction of laparoscopic cholecystectomy, the incidence has increased to 0.4-0.6%.^{5,6}. Approximately 77-89% of biliary tract injuries were observed in postoperatively period. Heterogeneous injury to the bile duct can cause postoperative abdominal pain, bile secretion, jaundice and cholangitis⁴.

Inexperience and familiarity with endoscopic anatomical interpretation can lead to iatrogenic biliary injury. This has fallen to less than 0.5% due to the growing experience of surgeons and the availability of better quality equipment¹. Other causes of bile duct injury include adhesions near the surgical field, use of diathermy near the bile duct, excessive dissection near the Calot's triangle and unexpected bleeding^{7,8}. This study focuses on frequency of iatrogenic biliary injuries.

MATERIAL & METHODS

This observational study was conducted at Surgical departments of Shaheed Benazir Bhutto Medical College, Lyari Karachi Pakistan, from July 2019 to August 2021. All diagnosed patients of gallstones on the clinically and findings of ultrasound of abdomen with any age, gender were included in study. Patient not willing for surgery, pregnant ladies, bleeding disorders, obstructive jaundice and carcinoma of gall bladder were excluded from this study.

The cases were operated by surgeons with different levels of experience. Standard four port technique was used. Data were analysed by using Statistical Package for Social Science (SPSS) software, Version 22.

RESULTS

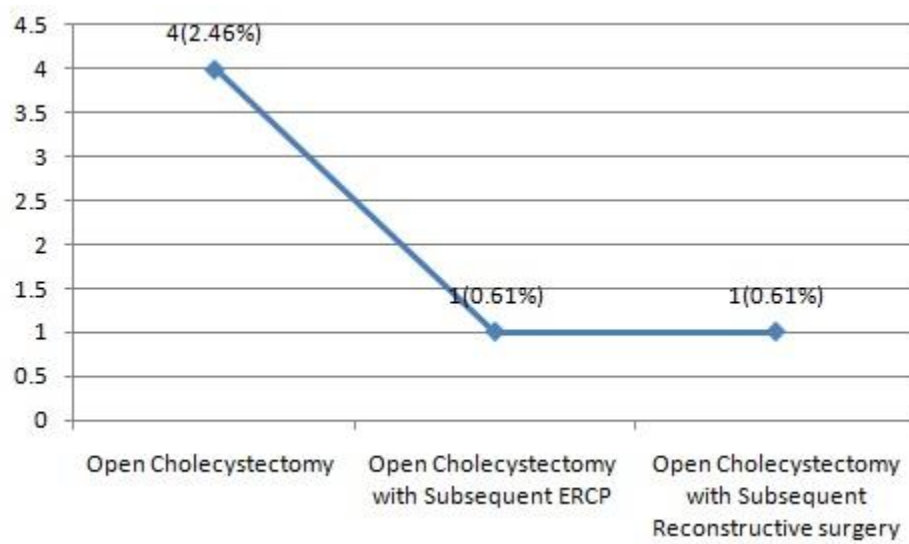
Laparoscopic cholecystectomy was performed in 162 patients. Among the 162 patients, there were 15 males (9.25%) and 147 females (90.74%), with a male to female ratio of 1:11.6. The mean age was 36.01 ± 8.11 years (20 to 60). According to our observation, there were 6 cases (3.70%) of common bile duct injury during the operation (Table No.1). Treatments offered range from ERCP and conservative treatment to reconstructive surgery. Four patients (2.46%) were converted to open cholecystectomy, 1 patient underwent open cholecystectomy subsequent ERCP, and 1 patient underwent open Cholecystectomy with Subsequent Reconstructive surgery (Chart No.1).

Table No.1
Demographic Variable
N=162

Variable	No. Patients	Percentage
Gender		
• Male	15	9.25%
• Female	147	90.74%
Age		
• 20 to 30 years	36	22.22%
• 31 to 40 years	63	38.88%
• 41 to 50 years	49	30.24%
• 51 to 60 years	14	8.64%
Common Bile duct injuries during laparoscopic cholecystectomy Procedure		
• Yes	6	3.70%
• No	156	96.29%

Chart No.1

CBD INJURIES MANAGEMENT



DISCUSSION:

Iatrogenic biliary injury is a serious complication of biliary surgery and presents a major challenge not only to primary surgeons but also to experienced referral centers^{9,10}. It has long been associated with prolonged morbidity and increased early mortality¹¹. The incidence of cholelithiasis depends upon the age groups. 63 cases (38.88%) with the highest incidence recorded in the third decade of life followed by 49 cases (30.24%) during 4th decade of life followed by 49 cases (30.24%) during 4th decade of life. While the compared with study of A. Viste was reported mostly 67 patients observed between range 14–86 median age of 55 years. An other international study conducted by Supriya Sharma¹³ et al showing higher incidence observed in 3rd and 4th decade group were most commonly involved. In general, cholelithiasis are less common in males. The ratio of male: female in the present study comes approximately to 1:11.6. In present study the percentage of males is 9.25% and that of females is 90.74%. Our findings closely correlate with Cosmin Moldovan¹⁴ who observed ratio of 2.7:1 in favor of female patients with an average age of 47 years, with limits between 20 and 85 years.

The common bile duct injury is most serious complication of Laparoscopic Cholecystectomy procedure. An international survey conducted in Italy on 56,591 Laparoscopic Cholecystectomies done in 187 different centers were observed 0.42% common bile duct injury¹⁵. In initially days of laparoscopic cholecystectomy. Increased incidence of injury are associated with the surgeon's learning curve, the significantly increased the incidence so the reduced the volume of laparoscopic cholecystectomy performed. International study did by Boddy on laparoscopic cholecystectomies over ten years, he observed the low incidence of CBD injury for hepatopancreaticobiliary surgeons as compared the consultant general surgeon (0.1% Vs 0.9%)¹⁶. Over the time, they experience the significantly decreased the incidence of CBD injury with increasing number of LCs performed. One team has done 150 laparoscopic cholecystectomies in three years, around 0.9% incidence of CBD injury observed, while other team who done more than 450 laparoscopic cholecystectomies had incidence of CBD injury of approximately 0.3%¹⁶. In 2006, Hobbs reviewing 22,789 cases observed, with the passage of time CBD injuries decreases day by day 1994 to 1998 (from 0.35% to 0.13%)¹⁷. In 2011 an analyzing the series 234280 LCs by Harrison , reported no any marked difference in incidence of bile duct injuries (0.24% vs. 0.26%) between the experienced surgeons and residents¹⁸. While in our study observed CBD injury during LC was 3.70%. However in our study there is a significant impact experience in LCs on incidence of iatrogenic bile duct injury.

CONCLUSIONS

Common bile duct injury commonly occur during laparoscopic cholecystectomy. Over time, improving surgical technique and experience reduced the overall incidence of CBD injuries.

REFERENCES

1. Faridoon S. Iatrogenic Bile Duct Injury Following Open and Laparoscopic Cholecystectomy and Treatment Outcome. *Journal of Surgery Pakistan*. 2018 May 30;23(1):21-4.
2. Khan JS, Ahmad R. Common Bile Duct Injury in Laparoscopic Cholecystectomy: A Comparative Audit. *Ann. Pak. Inst. Med. Sci.* 2015; 11(4): 164-167.
3. Mannan A, Soomro SA, Bhanbhro RJ, Ghauri A, Laghari MH, Shakir. Common bile duct injury; management and outcome study at Isra University Hospital Hyderabad Sind. *Professional Med J* 2015;22(6):818-822.
4. Karabulut M, Baş K, Gönenç M, Dural AC, Köneş O, Gök İ, Alış H. Diagnosis and treatment of iatrogenic bile duct injuries. *Med J Bakikroy*. 2012;8:116-22.
5. McPartland KJ, Pomposelli JJ. Iatrogenic biliary injuries: classification, identification, and management. *Surg Clin North Am*. 2008 Dec;88(6):1329-43.
6. Seeras K, Qasawa RN, Kashyap S, Kalani AD. Bile Duct Repair. *StatPearls [Internet]*. 2021 May 30.
7. Hadi A, Aman Z, Khan SA, Zafar H, Khan M, Afridi SK, et al. Surgical management of bile duct injuries following open or laparoscopic cholecystectomy. *J Pak Med Assoc*. 2013;8:1008-12.
8. Malik AM, Laghari AA, Talpur AH, Khan A. Iatrogenic biliary injuries during laparoscopic cholecystectomy. A continuing threat. *Int J Surg*. 2008;6:392-5.
9. Gluszek S, Kot M, Balchanowski N, Matykiewicz J, Kuchinka J, Koziel D, et al. Iatrogenic bile duct injuries-Clinical problems. *Polski Przegl and Chirurgiczny*. 2014;86:17-25.
10. Buturovic S. Iatrogenic injury to common bile duct. *Med Arch*. 2014;68:291-3.

11. Flores-Rangel GA, Chapa-Azuela O, Rosales AJ, Roca-Vasquez C, Böhm-González ST. Quality of life in patients with background of iatrogenic bile duct injury. *World journal of surgery*. 2018 Sep;42(9):2987-91.
12. Viste A, Horn A, Øvrebø K, Christensen B, Angelsen JH, Hoem D. Bile duct injuries following laparoscopic cholecystectomy. *Scandinavian Journal of Surgery*. 2015 Dec;104(4):233-7.
13. Sharma S, Behari A, Shukla R, Dasari M, Kapoor VK. Bile duct injury during laparoscopic cholecystectomy: An Indian e-survey. *Annals of hepato-biliary-pancreatic surgery*. 2020 Nov 30;24(4):469-7.
14. Moldovan C, Cochior D, Gorecki G, Rusu E, Ungureanu FD. Clinical and surgical algorithm for managing iatrogenic bile duct injuries during laparoscopic cholecystectomy: A multicenter study. *Experimental and Therapeutic Medicine*. 2021 Dec 1;22(6):1-8.
15. Nuzzo G, Giuliani F, Giovannini I, Ardito F, D'Acapito F, Vellone M, et al. Bile duct injury during laparoscopic cholecystectomy: results of an Italian national survey on 56 591 cholecystectomies. *Archives of Surgery*. 2005 Oct 1;140(10):986-92.
16. Boddy AP, Bennett JM, Ranka S, Rhodes M. Who should perform laparoscopic cholecystectomy? A 10-year audit. *Surgical endoscopy*. 2007 Sep;21(9):1492-7.
17. Hobbs MS, Mai Q, Knuiman MW, Fletcher DR, Ridout SC. Surgeon experience and trends in intraoperative complications in laparoscopic cholecystectomy. *J British Surg*. 2006 Jul;93(7):844-53.
18. Harrison VL, Dolan JP, Pham TH, Diggs BS, Greenstein AJ, Sheppard BC, et al. Bile duct injury after laparoscopic cholecystectomy in hospitals with and without surgical residency programs: is there a difference?. *Surgical endoscopy*. 2011 Jun;25(6):1969-74.