

A Study of Extra Biliary Complications of Laparoscopic Cholecystectomy

A. Z. M Forman Ullah^{1*} Mohammed Masud Karim² Syed Aminul Haque³
Tanvir Rahman⁴ Ashiqur Rahaman Siddique⁵ Tahmina Jannat⁴ Jasmin Begum¹

ABSTRACT

Background: Laparoscopic cholecystectomy has rapidly become the procedure of choice for gallbladder removal and has become the most common major abdominal procedure performed throughout the world. To observe the extra-biliary complications of laparoscopic cholecystectomy this research work was done.

Materials and methods: This observational study was carried out in the Department of Surgery, Chittagong Medical College Hospital, Chattogram, duration December 2015 to November 2016. A total of 100 Gall stone diseased patients were enrolled in this study and they were randomly allocated. Post operatively patients were observed, Data were collected, and Statistical analysis were obtained by using window based computer software devised with Statistical Packages for Social Sciences (SPSS-22).

Results: Among 100 patients male to female ratio was 4.6:1 with maximum age group of third and fourth decade. Seventeen patients were associated with other disease e.g. diabetes mellitus and hypertension. Per-operative complication rate was 5(5.0%) among those, per-operative port site bleeding 2(2.0%), cystic artery bleeding 1(1.0%), liver bed bleeding was in 2(2.0%) cases. All these complications were managed successfully and smooth recovery within normal time. Post-operative complication rate was 1(1.0%). Among those port sites infection were in 1(1.0%) case.

Conclusion: The findings of this study are expected to help taking perioperative measure to prevent extra-biliary complications. There may be some other devastating complications which may cripple the patients as well as surgeon.

Key words: Gall bladder; Extra-biliary Complications; Laparoscopic cholecystectomy.

Introduction

Gall bladder disease is one of the common surgical problems worldwide and gallstones are the most common biliary pathology. Cholecystectomy is one of the commonest surgical procedures in the world.¹

On the 15th June, 1882 Dr. Carl Johan Langenbuch, a German surgeon performed the first cholecystectomy on a 42-year-old man.¹ Then open cholecystectomy has

been performed for more than 100 years throughout the world as a standard treatment modality of symptomatic gall bladder disease. Laparoscopic cholecystectomy was first performed in France by Mouret, Quibois and Pasat in 1987.

After introduction of laparoscopic cholecystectomy procedure, it has become increasingly popular among surgeons and patients. Now laparoscopic cholecystectomy is the gold standard treatment for symptomatic and complicated gall stone disease.² Laparoscopic cholecystectomy is considered superior to open cholecystectomy in terms of less post-operative pain, shorter hospitalization, earlier resumption of activity, reduced cost, improved cosmesis and rate of complications.³ The most important advantage of laparoscopic cholecystectomy is that it abolishes the trauma of incision as well as transient ileus that follow the open abdominal surgery. Recovery after laparoscopic cholecystectomy is rapid, 80% patients discharge within 24 hours and remainder by 2nd post-operative day. However like many other surgical procedures laparoscopic cholecystectomy is not without complications and it may be life threatening if problems are not identified and managed per-operatively.

In early era of laparoscopic cholecystectomy operation time was longer, post-operative complications were

1. Assistant Professor of Surgery
Chattogram Maa-O-Shishu Hospital Medical College, Chattogram.
 2. Associate Professor of Surgery
Chittagong Medical College, Chattogram.
 3. Associate Professor of Thoracic Surgery
Chittagong Medical College, Chattogram.
 4. Resident of Surgery
Chittagong Medical College Hospital, Chattogram.
 5. Medical Officer of Surgery
Chittagong Medical College Hospital, Chattogram.
- *Correspondence : **Dr. A. Z. M Forman Ullah**
Cell : +88 01916 35 01 00
Email : formanullah74@gmail.com

Date of Submission : 18th April 2022
Date of Acceptance : 10th May 2022

more, even there were death resulting from technical error. Few studies involving large number of patients were reported operative mortality rate for laparoscopic cholecystectomy of 0-0.9%. The reported morbidity for laparoscopic cholecystectomy ranged from 2 to 6 percent.⁴

Biliary complications of laparoscopic cholecystectomy are reported in many studies.⁵ The extra-biliary complications do occur with almost same frequency and severity but tend to be under reported in the literature.^{6,7} Also the extra-biliary complications of laparoscopic cholecystectomy can proved to be fatal if not identified and managed during operation. The purpose of the study is to observe the extra biliary complications of laparoscopic cholecystectomy.

Materials and methods

This is a prospective observational study, was done in 100 diagnosed cases of gall stone disease. Patients were selected by purposive sampling technique and all patients were evaluated before surgery. Information was collected from the study population by questionnaire and case record form. Prior permission was taken from the Ethical Review Committee (ERC) of Chittagong Medical College Hospital. The objectives of the study along with its procedure, risk and benefits to be derived from the study was explained to the patients in easily understandable local language and then informed consent was sought from them.

The study was performed prospectively on admitted patients underwent laparoscopic cholecystectomy during December, 2015-November, 2016 at all three Units of General Surgery of Chittagong Medical College Hospital. Patients presenting in general surgical OPD and admitted in general surgical wards of the hospitals were recruited in the study after fulfilling inclusion/exclusion criteria. Informed written consent was obtained from all patients. At the end of the study data were analysed and the result of the study was prepared and submitted.

All the relevant data were compiled on a master chart first. Data analysis was done by, percentage and proportion as appropriate. The categorical data were expressed as number and percentage. The results were presented in tables, bar diagram, frequency chart and pie charts.

Results

A total of 100 patients highest incidence of laparoscopic cholecystectomy was done in 3rd and 4th decade. Among 100 patients, 82(82.0%) patients were female and 18(18.0%) were male with maximum age group of third and fourth decade. All the patients were accessed by open method. Seventeen patients were

associated with other disease eg- diabetes mellitus and hypertension. Per-operative complication rate was 5(5.0%) among those, access related port site bleeding 2(2.0%). Procedure related complications cystic artery bleeding 1(1.0%), liver bed bleeding was in 2(2.0%) cases. Peroperative complications were only encountered 5(5.0%) patients. Most of the patients had fibrosis, distended gall bladder, dense adhesion and large stone in the gall bladder. Among these problems Port site bleeding 2(2.0%) patients, liver bed bleeding 2(2.0%), cystic artery bleeding 1(1.0%) patients and port site infection in 1(1.0%) cases. All these complications were managed successfully and smooth recovery within normal time. Post-operative complications rate was 1(1.0%). Among those port site infections were in 1(1.0%) cases.

Table I Access related complications (n=100)

Complications	Number of complications	Percentage
Per operative port site bleeding	2	2.0
Subcutaneous emphysema	0	0.0
Small bowel injury	0	0.0
Colon injury	0	0.0
Major vessel injury	0	0.0

Table I shows bleeding from port site was in 2(2.0%) and no subcutaneous emphysema, small bowel injury, colon injury or major vessel injury.

Table II Procedure related complications (n=100)

Complications	Number of patient	Percentage
Cystic artery bleeding	1	1.0
Liver bed bleeding	2	2.0
Duodena injury	0	0.0
Colon injury	0	0.0
Diaphragmatic injury	0	0.0
Liver injury	0	0.0

Table II shows procedure related complications was cystic artery bleeding in 1(1.0%), liver bed bleeding was in 2(2.0%), Visceral injury was not found In any patients.

Table III Post operative port site complication (n=100)

Complications	Number of complications	Percentage
Port-site bleeding	0	0.0
Port-site infection	1	1.0
Port-site hernia	0	0.0

Table III shows among post-operative port site complication, 1(1.0%) port site infection. port site bleeding and port site hernia was not found in any patients.

Table IV Laparoscopic findings during operation (n=100)

Laparoscopic findings	Number of patients	Percentage
Distended gall bladder	11	11.0
Dense adhesion	26	26.0
Thick wall	12	12.0
Fibrosed gall bladder	10	10.0
Single stone	26	26.0
Multiple stone	74	74.0
Large stone	11	11.0
Empyema of gall bladder	0	0.0
Mucocele	0	0.0

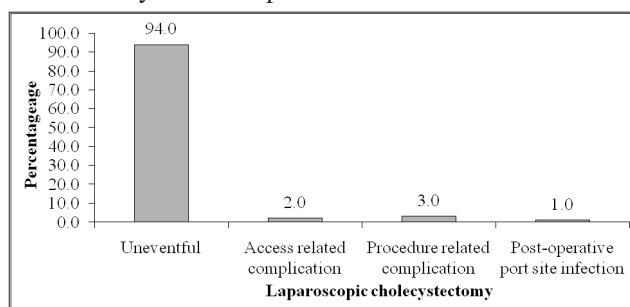
Table IV shows in per-operative laparoscopic findings. Gall bladder was distended in 11(11.0%) patients, densely adhesion in 26(26.0%) patients, thickened wall in 12(12.0%) patients, fibrosed gall bladder found in 10(10.0%) patients. 26(26.0%) patients gall bladder contained single stones, 74(74.0%) gall bladder contained multiple stones and having large stone in 11(11.0%) patients.

NB. *In some cases, multiple findings.*

Table V Outcome of patients underwent for laparoscopic cholecystectomy (n=100)

Parameters	Number of patients	Percentage
Uneventful	94	94.0
Access related complication	2	2.0
Procedure related complication	3	3.0
Post-operative port site infection	1	1.0

Table V Shows that there were 2(2.0%) access related complication, 3(3.0%) procedure related complication 1(1.0%) port site infection and 94(94.0%) patients did not have any such complication.

**Figure 1** Bar-diagram showing distributions of the study subjects by laparoscopic cholecystectomy

Discussion

The present study consisted of 100 patients of gall stone disease. They underwent laparoscopic cholecystectomy and results were evaluated, especially the spectrum of peroperative and postoperative extra-biliary complications, method of identification of complications as well as timing of complications and their management.

Age distribution of 100 patients ranged from 17 to 80 years with highest number of patients in third to fourth decade. Females were 4 times more commonly affected than males.

All the patients were investigated with liver function test (Serum bilirubin, SGPT, serum alkaline phosphatase, prothrombin time), ultrasonography of whole abdomen. All the patients had normal liver function test including patients having previous history of jaundice.

Ultrasonography of whole abdomen reveals 26(26.0%) of gallbladder containing single stones, 74(74.0%) of gallbladder containing multiple stones with normal looking. 10(10.0%) of gallbladder showed acute cholecystitis and 14(14.0%) gallbladder showed chronic cholecystitis.

All the patients were operated routinely 6-8 weeks after last acute attack. In our study we found most of the complication occurred while interval cholecystectomy was done. Early within 72 hours laparoscopic cholecystectomy for acute cholecystitis is the standard of care.⁸ Laparoscopic cholecystectomy should be done within 72 hours of acute attack, after that operation gradually become more difficult day by day due to more adhesion and sometimes empyema formation. Early laparoscopic cholecystectomy reduce total length of hospital stay and risk of readmissions attributable to recurrent acute cholecystitis. It is therefore a more cost effective approach for the management of acute cholecystitis.

Though operation in acute cholecystitis is bit difficult, complications can be reduced to minimum if meticulous principle of dissection is followed. The unwanted events can mostly be managed laparoscopically without conversion. But decision for conversion should be taken early if there is any confusion and thus mortality and morbidity could be minimized. In the USA 30.0% of patients with acute cholecystitis underwent cholecystectomy during the acute attack, the reminder allow the symptoms to settle for at least 6 weeks before performing laparoscopic cholecystectomy.⁹

This study shows complication was 19.0% of the patients. Nearly one fourth (23.0%) in cases of dense adhesion of gallbladder, due to adhesion operative field become obscure and tissue plane cannot identify properly where dissection become more difficult and more complications occur which is inconsistent with other study where high grade adhesions were encountered in 61.1% patients and overall intraoperative complications rate were 31.5%. seventeen patients had other systemic illness eg. diabetes mellitus 10(10.0%) patients and hypertension

7(7.0%) patients but none of them suffered from any postoperative complication may be due to our cautiousness. 18(18.0%) patient had previous lower abdominal surgery and none had peroperative complications.¹⁰

In this study per operative bleeding found in 3.0% cases where cystic artery bleeding in 1.0% cases, managed by clipping of cystic artery, bleeding from gall bladder bed in 2.0% cases and managed by suction, cleaning, cautery and sometimes we kept a drain in morison's pouch to avoid subhepatic collection. Port site bleeding in 2.0% cases managed by pressure and diathermy. The result of the present series almost same as other study revealed incidence of bleeding up to nearly 10.0%. Bleeding accounts for up to one third of all major complications seen in Laparoscopic cholecystectomy. The reported incidence of uncontrolled bleeding in Laparoscopic cholecystectomy can be up to 2.0% range from (0.3-0%).¹¹

Among the most common complications of Laparoscopic cholecystectomy is wound infection, typically at the trocar site of gallbladder removal. Wound infections were controlled by giving antibiotics after culture and sensitivity of wound swab and regular dressing. An incidence of port site infection after Laparoscopic cholecystectomy was reported by Ghnam W et al²⁴ as 0.9% and Watson DI et al as 0.9 to 1.3%.^{12,13}

By comparing and considering the spectrum of complications of Laparoscopic cholecystectomy which are preventable and can be avoided or minimized, if there is through knowledge of complications and strictly follow the principle of Laparoscopic cholecystectomy. Most cases of symptomatic gallstone disease can be treated safely by laparoscopy.

Conclusion

This study evaluated the spectrum of peroperative and postoperative complications of laparoscopic cholecystectomy, methods of their identification and appropriate measure to be taken to combat these complications. Laparoscopic cholecystectomy is safe and the complication rate is not higher than that for open cholecystectomy. Most of the complications are preventable if Laparoscopic cholecystectomy is performed by qualified surgeons following strict precautions, especially.

Recommendations

Laparoscopic cholecystectomy remains a safe procedure as long as the surgeon select the patient according to his expertise and measures should be taken to prevent complication.

Disclosure

All the authors declared no competing interest.

References

1. Chowdhury HK. Laparoscopic cholecystectomy: A study of 6500 cases. *ORION*. 2002;13.
2. Cheslyn-Curtis S, Russell RC. New Trends in Gallstone Management. *Br J Surg*, 1991; 78: 143-149.
3. Deziel DJ, Millikan KW, Economou SG, Doolas A, Ko ST, Airan MC. Complications of laparoscopic cholecystectomy: A national survey of 4,292 hospitals and an analysis of 77,604 cases. *The American journal of surgery*. 1993;165(1):9-14.
4. Clavien PA, Sanabria JR, Mentha G, Borst FR, Buhler L, Roche B, Cywes RO, Tibshirani RO, Rohner AD, Strasberg SM. Recent results of elective open cholecystectomy in a North American and a European center. Comparison of complications and risk factors. *Annals of surgery*. 1992;216(6):618.
5. Viktorsdóttir O, Bløndal S, Magnússon J. Frequency of serious complications following laparoscopic cholecystectomy. *Laeknabladid*. 2004;90(6):487-490.
6. Hobbs MS, Mai Q, Knuiman MW, Fletcher DR, Ridout SC. Surgeon experience and trends in intraoperative complications in laparoscopic cholecystectomy. *Journal of British Surgery*. 2006;93(7):844-853.
7. Singh R, Kaushik R, Sharma R, Attri AK. Non-biliary mishaps during laparoscopic cholecystectomy. *Indian journal of gastroenterology: official journal of the Indian Society of Gastroenterology*. 2004;23(2):47-49.
8. Reddick EJ, Olsen D, Spaw A, Baird D, Asbun H, O'Reilly M, Fisher K, Saye W. Safe performance of difficult laparoscopic cholecystectomies. *The American journal of surgery*. 1991;161(3):377-381.
9. Gurusamy K, Samraj K, Gluud C, Wilson E, Davidson BR. Meta-analysis of randomized controlled trials on the safety and effectiveness of early versus delayed laparoscopic cholecystectomy for acute cholecystitis. *Journal of British Surgery*. 2010;97(2):141-150.
10. Sasmal PK, Tania O, Jain M, Khanna S, Sen B. Primary access-related complications in laparoscopic cholecystectomy via the closed technique: Experience of a single surgical team over more than 15 years. *Surgical endoscopy*. 2009;23(11):2407-2415.
11. Huang CS, Tai FC, Shi MY, Chen DF, Wang NY. Complications of laparoscopic cholecystectomy: An analysis of 200 cases. *Journal of the Formosan Medical Association= Taiwan yi zhi*. 1992;91(8):785-792.
12. Ghnam W, Malek J, Shebl E, Elbeshry T, Ibrahim A. Rate of conversion and complications of laparoscopic cholecystectomy in a tertiary care center in Saudi Arabia. *Annals of Saudi medicine*. 2010;30(2):145-148.
13. Watson DI, Mathew G, Anthony J, Williams R. Impact of laparoscopic cholecystectomy in a major teaching hospital: Clinical and hospital outcomes. *Medical journal of Australia*. 1995;163(10):527-530.