

Original Article

The Study of Laparoscopic Cholecystectomy in Acute Cholecystitis, Complication and Management: Analysis of 150 Cases in the Ibn Sina Medical College, Bangladesh

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Abstract

Background: Laparoscopic Cholecystectomy has now become a better option instead of the Open Cholecystectomy for treatment of Cholelithiasis that it has been a gold standard for the Cholelithiasis condition throughout the Globe. Last century was the most fruitful era for the treatment of the biliary tract disease as it has already proved the progress from the open to laparoscopic surgery with a single port surgery. **Methods:** The purpose of our study is to grading of the Laparoscopic Cholecystectomy in Acute Cholecystitis and has been studying the outcome of problematic and challenging Laparoscopic Cholecystectomy cases, its' complication (s) and management to decide when to converting Laparoscopic Cholecystectomy to Open Cholecystectomy. The study analyzes the conversion rate of Laparoscopic Cholecystectomy in the Ibn Sina Medical College, Kallyanpur, Dhaka, Bangladesh. This is a retrospective study of 150 patients (Male - 75% and Female - 25%) which was conducted during the period from January 2015 to January 2017. **Results:** Out of the 150 cases 140 (93%) had been successfully operated by Laparoscopic Cholecystectomy. And, only 10 (7%) cases (out of a total of 150) got converted from the Laparoscopic to Open Cholecystectomy and they belonged to Grade - E with severely contracted gallbladder, morbid adhesion, short cystic duct and bile duct injury. **Conclusions:** The Laparoscopic Cholecystectomy has familiar as a unique procedure of choice for the management of symptomatic gall bladder. Laparoscopic Cholecystectomy intra operatively for grade A to E where Grade A is very easy level to perform Gall Bladder Surgery to Grade E where conversion is 115% due to bad.

Keywords: Acute Cholecystitis; Laparoscopic Cholecystectomy; Complication, Conversion

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Introduction

The Laparoscopic Cholecystectomy techniques have made a revolutionary change in gastro intestinal surgery in the recent years. Minimal invasive surgery, cure and safety of patient are the priority of the modern surgical method. Cholelithiasis, the most common digestive disorder was traditionally being dealt by convention or open surgery. Laparoscopic Cholecystectomy has been successful to prove and increase the importance of most minimal access. It is very safe and easy because of the better magnification. Advantages of Laparoscopic Cholecystectomy are

that it has shortened the hospital stay significantly, less morbidity, mortality, a quicker return to work and with excellent cosmetic performance. Now a day's conversion rate to open cholecystectomy is reduced. Even most difficult laparoscopic cholecystectomies have been performed very successfully without significant complications. Certain factors determining the conversion of Laparoscopic to open in today's set up are previous surgery leading to dense adhesions, Bile duct or cystic duct injury, Bleeding from cystic artery or liver fossa, Carcinoma of Gallbladder, Post ercp difficult adhesions and patient with

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Choledocholithiasis which is failed in endoscopic extraction of stones from such difficult cases are still a great challenge to trained Laparoscopic Surgeon (s), and the postoperative complications are known and should be considered while operating.

Grading of Laparoscopic Cholecystectomies was done from 'A' to 'E' categories. In our study we consider grade 'A' to 'E' cases and their outcome, complications and its management and which cases should convert to open Cholecystectomies. The grades are explained in details hereunder.

Grading of laparoscopic Cholecystectomies:

A. Laparoscopic Cholecystectomy done without difficulty clear Calot's triangle.

B. Laparoscopic Cholecystectomy done with flimsy adhesions due to previous cholecystitis attack but Calot's clear.

C. Laparoscopic Cholecystectomy done in cases with dense adhesions in Calot's triangle dissected with difficulty with electrocautery or aqua dissection.

D. Laparoscopy Cholecystectomy due to chronic cholecystitis with dense adhesion, Emphyema gallbladder and Gangrenous gallbladder.

E. Conversion to Open Cholecystectomy after the Laparoscopic Cholecystectomy due to various reasons like (a) Dense Adhesion, (b) Mass formation, (c) Chronic cholecystitis, (d) Emphyema or gangrenous gall bladder, (e) Intraoperative Complications and (f) Ca gall bladder.

Methods

The patients (study subjects) were admitted with diagnosis of the symptomatic cholelithiasis, who subsequently underwent Cholecystectomy at tertiary hospital during the period from 1st January 2015 to 1st January 2017.

All the patients were selected randomly; and they were interviewed for detailed possible clinical history as well as examined needed accordingly. Then, the patients were subjected to routine blood, urine and other required investigations and abdominal ultrasound was performed in all cases.

Inclusion criteria: Patients with acute calculus cholecystitis, proven by Ultrasonogram (USG) with at least one attack of upper abdominal pain and considered fit for elective cholecystectomy was

included in the study.

Exclusion criteria: The patients with the following conditions were excluded from the study:

- History of the investigations suggesting CBD stones
- History of the prior abdominal surgery.

A thorough written informed consent was taken from all patients prior to their inclusion in the study. The study was approved by the Ethical Committee of the hospital. The complete study was done and analyzed regarding the patients undergoing the Laparoscopic Cholecystectomy and the conversion rates to open cholecystectomy among them. The total number of patients selected for this study was 150. All the patients were kept nothing by mouth overnight, prior

Age in years	No of Patients	Percentage
<21	07	05
21-30	22	15
31-40	43	29
41-50	32	21
51-60	26	17
61-70	17	11
71-80	03	02
Total	150	100

Table 2: Gender Distribution of the Patients

Gender	No of the Patients	Percentage
Female	112	75
Male	38	25
Total	150	100

Table 3: Grade of Laparoscopic Cholecystectomy

Grade of Laparoscopic Cholecystectomy	No of the Patients	Percentage
A	41	27
B	39	26
C	41	27
D	19	13
E	10	07
Total	150	100

Table 4: Conversion to Open Cholecystectomy

Conversion to Open Laparoscopic	No of Patients	Percentage
Laparoscopic	140	93
Open	10	07
Total	150	100

to surgery and were given a dose of prophylactic antibiotic one hour prior to the surgery had been administered. All of them were asked to evacuate bladder prior to the surgery. All the surgeries were performed under general anesthesia, by the surgical team consisting of consultants and residents.

Ethical approval: The study was approved by the Institutional Ethics Committee

Results

In Grade E 6 patients were converted to open due to empyema of GB, gangrenous GB, Difficult Skeletinization, CBD injury. However B, C, D Category despite of all the difficulty, there was no conversion to open.

One patient in grade D suffered from postoperative bile leakage that was about 500ml at first two days;

Table 5: Intra Operative Findings vs Grade

Intra Operative Findings	Grade					Total
	A	B	C	D	E	
None	41	0	0	0	0	41
Flimsy Adhesions	0	38	0	1	0	39
Dense Adhesion	0	0	36	3	2	41
Bleeding and Bile Leak	0	0	4	5	0	09
Lump Formation	0	0	0	2	0	02
Empyema, Gangrenous Gb with Biliary Peritonitis	0	0	1	6	4	11
GB Anomalies	0	1	0	2	0	03
Friable Gallbladder	0	0	0	0	2	02
Difficult Skeletinization	0	0	0	0	1	01
CBD Injury	0	0	0	0	1	01
Total	41	39	41	19	10	150

Table 6: Post Operative Complication vs Grade.

Post-Operative Complications	Grades					Total
	A	B	C	D	E	
Bile Leak through Drain	0	0	2	1	0	3
Wound Infection	0	0	0	1	2	3
Total	0	0	2	2	2	6

Table 7: Conversion to Open vs Grade

Conversion to Open	Grade					Total
	A	B	C	D	E	
Laparoscopic	41	39	41	19	0	140
Open	0	0	0	0	10	10
Total	41	39	41	19	10	150

gradually it has been decreased over 7 days with no obvious complication. Other two patients in C grade had bile leakage of about 200ml in first two days.

Discussion

Laparoscopic Cholecystectomy is now a day's considered more popular than traditional procedure. Most of the progress in the field of GB disease and treatment has been made in the last century but gallstone and their sequelae date back to 1085-945 BC have been discovered in the mummy of Amen.¹ The first systematic data about the disease was published as "De medical historic mirabilis" by Marcellus Donatus in 1596. The first Cholecystectomy is credited to John Strong Bobbs on June 15, 1867.¹ Karl Langenbach of Berlin performed first planned Cholecystectomy on July 15, 1882 using the aseptic technique of Joseph Lister.²

In 1901 George Kelling examined the abdominal cavity with an endoscope and named the procedure as celioscopy by using air through puncture needle to create pneumoperitoneum.³ In 1929 Kalk introduced a dual trocar and opened the way for diagnostic Laparoscopic.⁴ In 1933 Fervers recommended CO₂ as insufflating agent on the basis of study comparing air, oxygen and CO₂ in 50 patients.³ In 1938 Janos V developed his spring loaded needle to create pneumoperitoneum and it is still in use.⁵ In 1960 Prof Kurt S developed automatic insufflation device that monitored abdominal pressure and gas flow. He also developed endoscopic instrument like thermo coagulation angled lens, hook scissors, endoloop applicator and irrigation- aspiration apparatus.⁶

Hasson proposed an open technique providing visualization of peritoneal cavity prior to trocar insertion and reduced the complication related to blind trocar entry.⁷ First Laparoscopic Cholecystectomy was performed by Philippe M in Lyon 1987. In 1999 Udwardi T performed the first Laparoscopic Cholecystectomy in India.² Anderson et al compared the Laparoscopic vs Open Cholecystectomy and found physiologically and economically betterment of Laparoscopic Cholecystectomy.⁸ Atwood also studied the same in 115 cases and found the Laparoscopic Cholecystectomy was safe, cost effective and there was faster recovery of patient.⁹ Williams Jr studied 1283 open Cholecystectomy and 1107 Laparoscopic Cholecystectomy and found that there was increase in mortality rate in

patients with acute cholecystitis treated with open Cholecystectomy and secondly there was increase in complication in patients with chronic cholecystitis treated with open Cholecystectomy with as compared with Laparoscopic Cholecystectomy group.¹⁰

Harris studied 115 Open / 115 Laparoscopic Cholecystectomy and found that morbidity was 9% and mortality 1% in Laparoscopic Cholecystectomy as compared to open Cholecystectomy where morbidity was 13% and mortality was 2%.¹¹ Koperna has done study of acute cholecystitis in 49 patients for each procedure and found conversion rate 44.9%.¹² Complication rate after Laparoscopic Cholecystectomy to be lesser. Bosch compared the economic benefits of 22 Laparoscopic Cholecystectomy over 153 open Cholecystectomy and found that operative time was 66 and 92 minutes respectively, complications was 9 and 6 cases respectively, post op stay 8 and 3 days.¹³ Cost of Laparoscopic Cholecystectomy was 18% less than that of Open Cholecystectomy because of shorter stay and less complication(s). Capizzi et al studied conversion rate in difficult Laparoscopic Cholecystectomy in 1360 cases and overall conversion rate was 1.8%. Median operative time was 55 minutes without any mortality and post of complication.¹⁴

During the study period only 12.1% of Cholecystectomy was performed by 59 Surgeons who were carried out with conventional techniques. The marginally higher rate of biliary injury with Laparoscopic Cholecystectomy and low incidence of complication such as bowel perforation unique to this procedure seemed to be outweighed by low rate of other complication such as death, hemorrhage and pulmonary problems. This study also shows that laser dissection or cautery is better for removal of gall bladder from hepatic bed. Both are effective and safe, on the evidence of this series as they are used by trained surgeon. Cautery is also cheaper.

Conclusion

The Laparoscopic Cholecystectomy has become the procedure of choice for management of symptomatic gall bladder. At times, it is very easy and could be done quickly. Occasionally it is difficult and takes longer time. But there is no grading or scoring system available to predict the severity of difficulty of the Laparoscopic Cholecystectomy intra

operatively. So our aim of this study was to develop an absolute grading system to predict difficulty level of Laparoscopic Cholecystectomy intra operatively for grade A to E where Grade A is very easy level of performing Gall bladder surgery to Grade E where conversion is 115% due to bad. The proposed scoring system is relative and can be written on the patient's indoor paper as well as on discharge card to know the severity of the disease as well as difficulty (ies) during Laparoscopic Cholecystectomy.

In our study conversion rate to open Cholecystectomy even in C and D category of the Laparoscopic Cholecystectomy has decreased tremendously due to the surgeon's experience in Laparoscopic Cholecystectomy. The role of Aqua dissection (continuous water irrigation with pressure) has also proved beneficial in dissection of adhesions or achieving good hemostasis and better visualization of hepatobiliary triangle due to biliary leakage. In our center the conversion rates have decreased as a

result of better techniques practiced while dissecting gall bladder and defining Calot's triangle clearly by using water irrigation, proper placement of ports, experience of surgeon and better Assistance, New Instruments and new electrosurgical equipment's (bipolar, vessel sealer) We have also found that the conversion to open Cholecystectomy should be done in proper time without any hesitation in case of complications that could not be managed by laparoscopic surgery and conversion in such case reflects judgment and should not be considered as a complication.

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