Laparoscopic Cholecystectomy: An Experience in Combined Military Hospital, Rangpur

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Abstract

Background:
Laparoscopic surgery (LC) has gained popularity quickly due to its many benefits over traditional open surgery. The reduction in postoperative pain had a positive impact on humans, as did the shorter hospital stay and earlier return to work. Nevertheless, this procedure has various per-operative and postoperative complications that cannot be ignored, despite being a minimally invasive technique.

Objective:
The aim was to evaluate the intraoperative, postoperative complications of laparoscopic cholecystectomy (LC); the rate of conversion to open cholecystectomy and the reasons for it; the length of the hospital stay following the procedure; and the operating time.

Methods:
This retrospective study included 245 individuals who had laparoscopic cholecystectomy performed between July 2022 and June 2024 at Department of Surgery,Combined Military Hospital (CMH), Rangpur. Retrospective analysis was done on patient medical records. Armed Forces persons and their family members who are entitled to have medical treatment facilities were included in this study.

Results:
Out of 245 participants, 211(86.12%) were females and 34(13.88%) males. The average age of the male and female patients was 40.13 and 39.20 years respectively.Most prevalent age group was between 3rd and 4th decade in both sexes. Hypertension (HTN) (6.12%), diabetes mellitus (DM) (6.12%), and HTN & DM, together (6.12%) were most commonly associated comorbidities. 180(73.47%) patients showed normal anatomy of gall bladder (GB) per-operatively. 39(15.92%) patients had major and minor intra operative complications while 14(5.71%) patients had postoperative complications. 12(4.90%) conversion open cholecystectomy was done in that series due to different reasons. In 126 cases (51.53%) operating time was <40 minutes and 119 cases (48.57%) that was >40 minutes and in most cases (86.12%) post operative hospital stay was <48 hours.

Conclusion:
LC brought a new range of complications. Right patient selection and timely bailout decision for difficult LC may reduce mortality and morbidity in a non-tertiary care hospital.

Keywords: Laparoscopic cholecystectomy, Complications, Conversion to open cholecystectomy, Hospital stay

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Introduction:

One of the most common laparoscopic procedures and one of the most common operations in general surgical units is LC.[1] The most frequent reason for LC is symptomatic gallstone disease, and 90% of cholecystectomy procedures are currently performed laparoscopically.[2] According to studies, LC shortens hospital stays and encourages an early recovery and return to regular activities.[3] Between 0.5 and 6% of LC patients experience problems.[4]

The most severe side effects are linked to a high death rate, CBD damage with a frequency of 0.1% to 0.6%,[5] and major blood vessel damage that varies from 0.04 to 1.22%.[6] Iatrogenic GB perforation with gallstones spilt is the most frequent consequence, occurring 10–30%.[7] LC is associated with low incidence of complications though incidence of bile duct injury is increased compared with open cholecystectomy which can be controlled by better training and introduction of better optics.[8] In addition to determining the length of hospital stay, duration of operation, and complications, this study sought to determine the number of conversions to open cholecystectomy and the reasons behind them.

Methods:

The retrospective study was conducted at CMH Rangpur using secondary data from hospital records (admission records, anesthetic records, surgery notes, and post-operative follow up records) of 245 patients who had` laparoscopic cholecystectomy for cholelithiasis between July2022 to June 2024. We have analyzed the patient's profile, medical history, laboratory investigations, abdominal ultrasound (US), anesthesiology protocol and operative protocols for this study. LC was avoided in patients who had upper abdominal surgery, patients with evidence of CBD stone, patient with acute presentation (e,g. acute cholecystitis or right upper quadrant lump/phlegmon), cirrhotic liver with or without portal HTN, GB mass or suspected GB lesion, patient suffering from malignant disease or receiving chemo or radiotherapy and at any stage of pregnancy. Preoperative, intra operative and postoperative details were collected and analyzed. Comorbidities were optimized with the help of respective specialists. Informed consent was taken and counseled adequately for whether any conversion to open cholecystectomy was required. Patients who were on oral anticoagulants stopped a minimum of 07 days prior to surgery. Standard four port technique was adopted for LC. Supra umbilical or infraumbilical primary port was made blindly, and gallbladder (GB) specimens were extracted though the epigastric port. A sub-hepatic drain was placed when indicated. Conversion to open cholecystectomy was done usually when there was difficult access and identification of anatomical structures at Callot's Triangle (cysto-hepatic triangle) or assuming any imminent risk of biliary channel/vascular/intestinal injury while proceeding with dense adhesion of GB with surrounding structures which was subjected to surgeon and evident biliary channel injury.

Results:

Majority of the patients were in the age group of 31-45 years (59.18%). Out of 245 patients in this study 211 (86.12%) were female and 34(13.88%) were male. The average mean age for female was 39.20 years and that for male was 40.13 years (Table-I). 26.94% patients had different comorbidities, of them Diabetes (6.12%), Hypertension (6.12%), and both Diabetes & Hypertension (6.12%) (Figure-1).

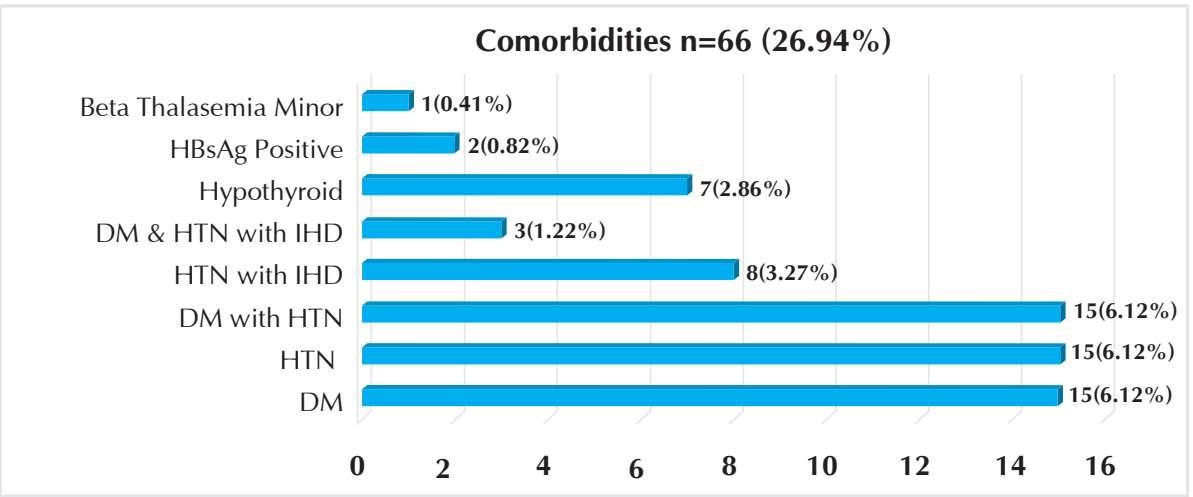

Figure-1: Comorbidities of the participants (n=66, 26.94%)

DM= Diabetes Mellites; HTN= Hypertension; IHD= Ischemic heart disease

A variable anatomy noticed during LC, in 180(73.47%) case GB was with normal anatomy followed by distended GB (6.12%), shrunken GB (4.08%), mucocele of GB (4.08%) (Table-II).

Table-I: Age and sex of the participants (n=245)

Demographics	no. (%)
Age Group (Years)	
15-30	45(18.37)
31-45	145(59.18)
46-60	43(17.55)
61-75	11(4.49)
>75	1(0.41)
Sex	
Male	34(13.88)
Female	211(86.12)

Table-II: Variable anatomy of GB and biliary tree (n=245)

Anatomical variation	no. (%)
Normal GB	180(73.47)
Distended GB	15(6.12)
Shrunken GB	10(4.08)
Mucocele	10(4.08)
Empyema GB	5(2.04)
Frozen Callot's	12(4.90)
Accessory ducts	3(1.22)
Moynihan's Hump	5(2.04)
Anterior cystic artery & right hepatic artery	5(2.04)

15.92%(39) patients had intra operative complication. The most common complication was iatrogenic perforation of GB 6.12% (15), bleeding from GB bed 2.86% (7) and GB stone spilled 7(2.86%) and biliary channel injury occurred in 0.82% (2) one complete transaction and one lateral injury of CBD) (Table-III).

Table-III: Intra Operative Complications (n=39; 15.92%)

Intra Operative Complications	no. (%)
Iatrogenic perforation of GB	15(6.12)
Biliary channel injury	2(0.82)
Bleeding from adjacent to GB	5(2.04)
Bleeding from cystic artery	0(0.00)
Bleeding from port side	2(0.82)
Spilled GB stones	7(2.86)
Bleeding from GB bed	7(2.86)
Lost stone	1(0.41)

Most of the operation was performed around 40 minutes, 51.43% within 40 minutes and rest was >40 minutes. 5.71% (14) patients had postoperative complications, the most common was right shoulder pain in 2.04% followed by bile leakage 1.23%. In one case there was a retained stone in CBD, which might have happened due to migration of stone in CBD during the perioperative period or failed to diagnose prior to LC (Table-IV).

Table-IV: Post-operative Complications (n=14; 5.71%)

Post operative Complications	no. (%)
Retained Stone in CBD	1(0.41)
Stone in remnant of cystic duct	1(0.41)
Acute cholangitis	1(0.41)
Acute pancreatitis	1(0.41)
Bile leak	3(1.23)
Bleeding	1(0.41)
Right shoulder pain	5(2.04)
Port site infection	1(0.41)
Port site hernia	0(0.00)

Conversion to open cholecystectomy was done in 12 cases (4.90%), among which frozen Callot's (difficulty in access and display of critical view of safety) was most common (2.86%) followed by dense adhesion (1.22%), and biliary channel injury (0.82%) (Figure-2).

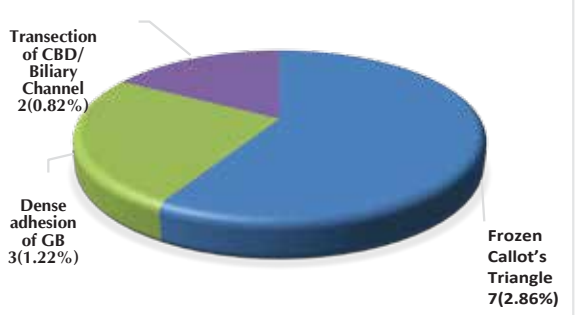

Figure-2: Reasons for conversion of open cholecystectomy (n=12;4.90%)

Table-V: Post-operative hospital stay

Post-op hospital stay	no. (%)
Laparoscopic Cholecystectomy	233(95.10)
<48 hrs	210(85.17)
>48 hrs	23(9.39)
Mean±SD	38.70±30.75
Conversion Open Cholecystectomy	12(4.90)
<48 hrs	1(0.41)
>48 hrs	11(4.49)
Mean±SD	94.60±19.00

Discussion:

It is important to avoid overestimating or underestimating the danger of LC. LC is becoming the preferred treatment for gallstone disease symptoms and is growing in popularity every day. The benefits of LC have been demonstrated and documented, including shorter hospital stays, faster recovery from surgery, and faster return to work.[9] However, a number of studies have demonstrated that LC is linked to a higher frequency of problems than open cholecystectomy. These issues include vascular, visceral, and common bile duct lesions during the laparoscopic surgery.[10] Jatzko et al[11] conducted another comparative investigation showed compared to LC, open procedure was linked to a 7.7% morbidity rate vs 1.9% and a 5% death rate vs 1%.

Gall stone disease seen in this study showed female predominance as usual. Out of 245 cases, 211 (86.12%) were female, with high frequency in the late 3rd decade (125 cases, 51.02%), whereas 34 (13.88%) were male, with high frequency in the early 4th decade (20 cases, 8.16%). A variable anatomy noticed during the procedure in 180 (73.47%) case, GB was with normal anatomy, distended GB 15 (6.12%), shrunken GB 10 (4.08%), mucocele of GB 10 (4.08%) were also noticed. In a few cases aberrant anatomy like accessory duct 3(1.22%) (all subvesical), Moynihan's Hump 5(2.04%), anterior cystic and hepatic artery 5(2.04%) were found. Aberrant anatomy of biliary channel orvessels are not uncommon and may cause biliary or vascular injury if Callot's Triangle is not dissected with precaution during the procedure.Damage to the biliary channel is one of the most dreaded side effects of LC. Despite several advancements in LC method, it remains high. Compared to open cholecystectomy, which occurs in 0.5% of patients, this damage occurs more commonly in LC (1% of cases).[12] Only two occurrences (0.82%) were identified in our study; one had a complete CBD transaction in which Roux-en-Y hepatico-jejunostomy restored biliary continuity, and the other was a lateral CBD damage that was fixed by T-tube. According to a review of current research, the rate of damage to the CBD is between 0.1% and 0.6%.[13] After analyzing data from 13,305 LC conducted over 13 years, Tanitia et al[14] discovered that 52(0.32%) of the instances had a CBD transaction. A crucial component of LC research is the conversion rate to open cholecystectomy. Conversion is not a complication; rather, it provides a means for the surgeon to complete the procedure safely. In this study reports 12(4.90 %); male 4(11.76%) and female 8(3.79%) cases. Conversions are more frequent in males (7.9%) compare to female (1.99%) which agrees the studies published by others.[15] The rate of conversion reported in today's literature are 2-15%.[16] A meta-analysis on 14545 LC by Yang et al reports 940(6.41%) conversions.[17] In frozen Callot's,when it was difficult to access and identify anatomical structures, and it took a prolonged time but unable to display the critical view of the safety decision made for conversion in 07(2.86%) cases. Intra-operative apparent biliary channel injury was found in 2(0.82%)cases, and conversion was done. Due to dense adhesion of GB with surrounding structures, another 03(1.23%) conversion was done.GB perforation with gallstones fell in the peritoneal cavity is a common complication that makes the process time-consuming since it's necessary to remove all of the stones and then irrigate the area to remove the bile that has spilt. In prospective research including 10,174 patients, Z'graggen K et al[18] revealed that 1.4% of complications were brought on by split gallstones. Ten to thirty percent is the predicted rate of GB perforation. In our study iatrogenic perforation of GB happened in 15 cases (6.12%) and stone spilled in 7(2.86%) patient. In one patient we could not retrieve one stone but fortunately that female patient didn't develop any complication. Duca et al[7] reported the iatrogenic perforation of GB was 1517 (15.9%) out of 9542 LC.Bleeding from cystic artery, liver bed or adjacent structures is commonest intra-operative complication. In this study notifiable or mentionable bleeding occurred in 14 cases (5.71%); 7(2.86%) from GB bed of liver, 5(2.04%) from adjacent structures of GB and 2(0.82%) from port site which were managed per operatively. According to research by Kaushik R,[19] up to 10% of cases result in bleeding problems. Out of 1225, 15(1.22%) were reported by Marakis et al.[20] Hospital stay and operating time are key considerations in LC. Although critics initially highlighted extended operating times as a drawback, especially during the learning phase, our data show an operating time of 40 minutes around. Among these, 48.98% of cases were completed within 40 minutes. Additionally, the

majority of patients, 200(81.63%), were discharged on the second post-operative day. The adoption of clipless LC technology has substantially reduced operating times.[21] With the advent of daycare LC, earlier patient discharges have become achievable.[21] The post operative morbidities found in 14(5.71%) cases. Right shoulder pain, stone in remnant of cystic duct and CBD, acute cholangitis, acute pancreatitis, port site infections,bile leak through drain were mentionable. Right shoulder pain is a common post operative expected discomfort after LC and prior counseling can easily address the situation. We noticed those usually happened when there was perforation of GB and if normal saline irrigation not done adequately to clear the bile. Cystic duct stone was retrieved laparoscopically in hepato-billiary center CMH Dhaka and CBD stone by ERCP. Bile leak found in 3(1.23%) cases, in two cases after a difficult LC and another one after a conversion open cholecystectomy, the drained output was initially around 200ml/day which reduced to nil on 10th to 14th POD. These might be due to leakage from minor billiaryradicals at GB bed of liver or when subtotal cholecystectomy done and stump could not be secured properly. Detachment of the GB may open any accessory bile ducts present in the GB.[22,23] We found two cases of post operative acute cholangitis and pancreatitis reported after discharge from hospital were treated conservatively at indoor and recovered well, we could not find out reasons behind those but might be due to passage of stones those temporarily lodged in CBD or at ampulla of Vater. Post operative bleeding was found in 1 case on 2nd POD in a conversion open cholecystectomy patient through drain tube though US of abdomen and pelvis found no collections in peritoneal cavity, and it stopped spontaneously. We suspected that it might have happened from the parietal wall. Morbidity rates of 5%, 5.4%, 4%, and 6.4% is reported by various author in literature.[24] There was no death rate in our trial. The literature has documented mortality rates between 0.08% and 1%.[25]

Conclusions:

Laparoscopic cholecystectomy has revolutionized the management of symptomatic gallstone disease since it induction more than 3 decades back. It has gained widespread acceptance and presenting the gold standard for GB stone diseases. Feared complications, likebiliary and vascular injuries and gastrointestinal perforation, can be avoided or minimized by preoperative workup, right patient selection, understanding variability in biliary anatomy, and timely decision of bailout surgery for difficult LC, especially in a peripheral CMH where facilities (e.g., intra-operative cholangiogram or ultrasound etc.) are limited.

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