



## Conversion In Laparoscopic Cholecystectomy: An Evaluation Study

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### Abstract

In the present study, we studied the various reasons for conversion in laparoscopic cholecystectomy; and recommended various methods and measures to decrease the incidence of conversion and associated complications with this procedure. One hundred and seventy six patients in age group of 20-55 years, M:F ratio as 1:9 with body weight in range of 45-65 kilogram, who were having cholelithiasis without choledocholithiasis and contraindication for general anaesthesia underwent laparoscopic cholecystectomy between Jan 2002 and Dec 2003. There were a total of ten surgeons performing laparoscopic cholecystectomy out of which two surgeons had experience of more than 200 laparoscopic cholecystectomies. Twenty one patients (11.93%) out of a total of one hundred and seventy six (11.93%) had to be converted to open cholecystectomy for reasons which included dense omental or visceral adhesions- 5(2.84%), postoperative adhesions with parieties and viscera (intestines) - 3 (1.70%), uncontrollable bleeding from liver bed - 3 (1.70%), uncontrollable bleeding from cystic artery - 2(1.14%) unclear anatomy - 2(1.1.4%), cholecystoduodenal fistula - 1(0.57%), common bile duct injury - 1 (0.57%), cirrhotic liver with shrunken gallbladder - 1(0.57%), spillage of stone - 1(0.57%), pneumoperitoneum related complications - 1(0.57%), instrument/equipment failure - 1 (0.57%).

Good Laparoscopic skill, adequate experience and innovations are prerequisites for safe and cost-effective laparoscopic cholecystectomy thereby reducing conversion rate.

### Key Words

Laparoscopic cholecystectomy, Cholecystitis, Cholelithiasis

### Introduction

Biliary diseases constitute a major portion of digestive tract disorder. Among these gall stone disease is the most common biliary pathology. Carl-Langenbuch performed first ever cholecystectomy on 15 in July 1882 in Berlin on a 42 years old man. Laparoscopic cholecystectomy first of all performed by Philippe Moret in Lyon, France in March 1987 has in fact revolutionized the treatment of cholelithiasis(1).

Since the National Institutes of Health Consensus Conference in 1993, laparoscopic cholecystectomy has replaced open cholecystectomy as the gold standard in the treatment of patients with symptomatic cholelithiasis(2). No doubt, laparoscopic cholecystectomy has become the treatment of choice for

many patients, providing advantage of decreased pain and disability and potential cost saving; however the outcome of Laparoscopic cholecystectomy is influenced greatly by the training, experience, skill and judgment of the surgeon performing the procedure(3). Here we present a prospective study reporting our experience with laparoscopic cholecystectomy, reasons for conversion and various modifications and techniques and innovations to avoid these conversions.

### Material and Methods

The study was conducted on all the patients undergoing laparoscopic cholecystectomy, in various units of Post Graduate Department of Surgery, Government Medical College Hospital, Jammu. All patients presenting with cholelithiasis without

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choledocholithiasis; and with no contraindication for general anaesthesia were included in the study.

Standard Laparoscopic cholecystectomy procedure was performed. Adhesions of GB were separated by blunt, sharp and hydro dissection and by use of suction cannula and gauze piece. Distended GBs were decompressed by suction and aspiration. Cystic Duct and Cystic Artery identified, ligated and divided with endoclips. Wide Cystic Ducts were suture ligated and divided. Fundus first method and sub total cholecystectomies were performed for unclear anatomy of calot's triangle. GBs were dissected from GB fossa by use of hook/spatula/seissors. Hemostasis done by using monopolar cautery. GBs extracted through epigastric port. GB fossas re-examined and suction dried. Drains were kept through 5 mm port at Anterior axillary line. Port closure was used for port site bleeding. Skin closure was done with skin stapler or suture.

### Results

Twenty one patients out of a total of 176 patients under study had to be converted to open laparoscopic cholecystectomy owing to various reasons as enumerated below:-

**TABLE: DISTRIBUTION OF CASES ACCORDING TO REASONS FOR CONVERSION. n=176 (n = number of cases)**

Reasons for conversion	No.	%age
Dense omental or visceral adhesions (with no previous history of abdominal surgery)	05	02.84
Postoperative adhesions with parieties and viscera (intestine)	03	01.70
Uncontrollable bleeding from liver bed	03	01.70
Uncontrollable bleeding from cystic artery	02	01.14
Unclear anatomy	02	01.14
Cholecystoduodenal fistula	01	00.57
Common bile duct injury	01	00.57
Cirrhotic liver with shrunken gallbladder	01	00.57
Spillage of stones	01	00.57
Pneumoperitoneum related complications (Bradycardia)	01	00.57
Instrument/Equipment failure	01	00.57
Mirrizzi syndrome	00	00.00
Obesity	00	00
Acute Cholecystitis	00	00.00
Injury to intestine	00	00.00
Carcinoma gallbladder	00	00.00
Retraction difficulty	00	00.00
Cystic duct avulsion	00	00.00
Respiratory acidosis	00	00.00
Inability to secure cystic duct	00	00.00
TOTAL	21	11.93

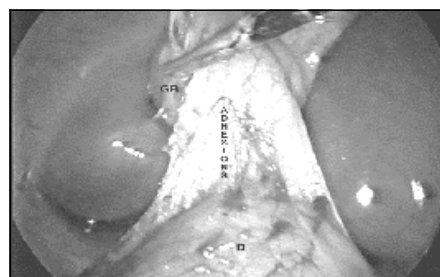
There were more conversions by surgeons in learning phase of laparoscopic cholecystectomy. Individual conversion rates were 23.33% by surgeons with experience of <50 laparoscopic cholecystectomies; 22.78% by surgeons with experience of 50-200 laparoscopic cholecystectomies and 03.92% by surgeons with experience of >200 laparoscopic cholecystectomies.

### Discussion

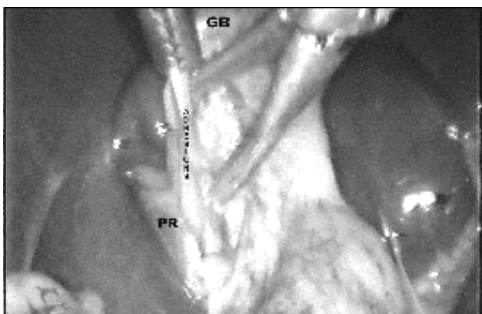
Morbid obesity had been considered as a contraindication, and can contribute to conversion, especially in early experience or if trocar and instruments were too short, displacement of trocar and instruments, decreased mobility of instruments due to restricted movement of trocar(4). We had 6 obese patients in our study and we placed operating port 3 to 5 cm above the umbilicus in the midline without using extra long trocars or instruments.

Previous abdominal surgery can also be a cause of conversion(5). We had 18 patients with history of previous lower abdominal surgery and one patient with history of upper abdominal surgery. We did not encounter any difficulty in access in any of patient with history of lower abdominal surgery where pneumoperitoneum could be carried out by closed method unlike Fried G.M. *et al* (6). who used open insertion of initial port, and at times gained initial access through upper quadrant.

Adhesions can cause visual blockade of access to the gallbladder(7,8). We had 87 (49.43%) patients with adhesions in our study. Adhesions could be separated successfully laparoscopically in 79 (44.88%) patients by means of blunt and sharp dissection, and by means of cautery, irrigation and suction, wherever necessary. We didn't use laser to separate adhesions as had been done by Hershmann M.J. and Rosin R.D(9).

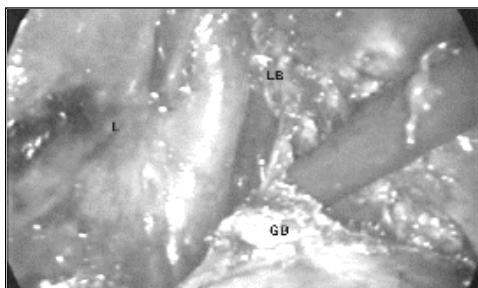


**Fig 1: Adhesions of gallbladder with duodenum GB = Gallbladder D= Duodenum**



**Fig 2: Adhesions of gallbladder with portal radicle**  
**GB = Gallbladder, PR = Portal Radicle**

We had 11(06.25%) patients with unclear calot's triangle anatomy out of which 5 (02.84%) patients could be managed by laparoscopic subtotal cholecystectomy with fundus-first Laparoscopic cholecystectomy in one patient as had been done by Mahmud S. *et al.*(10) and Chowbey *et al.* (11) who used either Endo-GIA stapler, sequential click or a suture for stump closure. We did not use Endo-GIA stapler in any of patients in our study. Successful delineation of Calot's triangle by blunt and careful dissection and Laparoscopic cholecystectomy could be performed in 4 (02.27%) patients. All these cases were performed by experienced surgeons (experience of more than 200 Laparoscopic cholecystectomies). Remaining 2 (01.14%) patients which were taken up by less experienced surgeons (experience of 50-200 Laparoscopic cholecystectomies) had to be converted to open cholecystectomies.



**Gallbladder stump being sutured with polyglactin 910, 2-0 on needle L= Liver, GBS= Gallbladder stump, N= Needle**

Wide cystic duct could be a cause of conversion. In our study there was a wide cystic duct in 31(17.61%) cases. We managed wide cystic duct by knotting and suturing alone, which is the usual method of managing the cystic duct by experienced surgeons. There was no conversion in any of cases with wide cystic duct as had

been observed by Trondsen *et al.* (1994) (12).

Conversion because of cystic artery bleeding has been reported as a cause of conversion by Cuschieri *et al.*(13), Cystic artery injury occurred in 5 (02.84%) cases in our study. Bleeding could be controlled in 3 (01.70%) cases whereas 2 (01.14%) cases were converted.

Significant bleeding from liver bed occurred in 8 (04.55%) cases in our study. This bleeding could be managed in 5(02.84%) cases by means of cautery, compression with gallbladder, sponge and/or spongiston application. But in 3 (01.70%) cases bleeding from liver bed couldn't be controlled and the procedure had to be converted to open cholecystectomies as had also been done in studies conducted by Perissat *et al.*(14), Sanabria *et al.*(15).

Spillage of stones as a cause of conversion had been observed by Frazee R.C. *et al.* (1992)(16). In our study, there occurred spillage of stones in 30 (17.05%) cases out of which conversion was required in only 1(00.57%) cases, so as to retrieve the stones whereas in other cases, stones could be retrieved in a self-designed retriever bag ( finger glove).

Instrument/Equipment failure could be a cause of conversion as observed in studies by GO PMNYH *et al.*(17) and Kumar *et al.* (18). We had 1 (00.57%) patient in whom both clip applicator as well as cautery failure occurred and procedure had to be converted to open cholecystectomy.

Experience of surgeon is directly proportional to conversion.(19-22) Out of a total of 10 surgeons performing laparoscopic cholecystectomy in our study, conversion rate was 23.33% for surgeons with experience of less than 50 laparoscopic cholecystectomies, 22.78% for those with experience of 50-200 Laparoscopic cholecystectomies and 03.92% for those with experience of more than 200 laparoscopic cholecystectomies.

We noticed common bile duct injury in 1(00.57%) patient who required conversion.(23-26) Bile duct injury can be prevented by lateral (rather than cephalad) retraction of the infundibulum, precise identification of the cystic duct junction with the gallbladder or the common bile duct, use of a 30° angled viewing scope, dissection of the gallbladder neck from the liver towards the cystic duct, avoidance of blind use of clips, cautery or laser for hemostasis.



We had 2 patients with cirrhosis liver in our study. In one patient, stones were removed, then anterior wall of gallbladder was removed and posterior wall was kept intact in order to avoid bleeding from liver bed, mucosa was cauterized to avoid nidus for infection and /or adenocarcinoma. In another patient of cirrhosis liver with shrunken and packed gallbladder, procedure had to be open cholecystectomy.

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