

Original research article

Analytical study of complex cholecystectomy performed with laparoscopic surgery in Bihar

Dr. Meet Verma,¹Dr. V.K. Gupta,²Dr. N.P Narain

¹Assistant Professor, Department of Surgery, Nalanda Medical College and Hospital, Bhootnath, Patna, Bihar, India

²Associate Professor, Department of Surgery, Nalanda Medical College and Hospital, Bhootnath, Patna, Bihar, India

³Retired Professor & Head, Department of Surgery, PMCH, Patna and Nalanda Medical College and Hospital, Bhootnath, Patna, Bihar, India

Corresponding Author:

Dr. Meet Verma (docmeetverma@gmail.com)

Abstract

Background: Laparoscopic cholecystectomy is one of the most common surgical procedures performed. Difficult gall bladder is difficult to define. In this study we tried to precisely define difficult gall bladder. We tried to study patient factors affecting pre operatively, investigations predicting difficult gall bladder and worked out system predicting degree of difficulty intra operatively.

Aims and Objectives: To study of complex cholecystectomy performed with Laparoscopic Surgery: our experiences.

Materials and Methods: In this prospective study, was conducted in the Department of surgery of Jawahar Lal Nehru Medical College and Hospital, Bhagalpur and Nalanda Medical College and Hospital, Patna, Bihar, India, between October 2021 and September 2022. Total of 42 cases of complex gall bladder who underwent laproscopic cholecystectomy successfully, 2males and 1female cases converted to open cholecystectomy as it was need of the time for betterment of patients.

Results and Observations: In our study most of the cases are from the age group 31-40 i.e. 11 cases (26%), followed by 41-50 i.e.7 cases (16.66%) female patients were more i.e. 23 cases (54.8%) than male i.e. 19 cases (45.2%) with female to male ratio 1:0.8.

Conclusion: Laparoscopic cholecystectomy is a safe procedure for gall stone diseases. However, some patients need conversion to standard protocol like Laparoscopic subtotal cholecystectomy and laparoscopic partial cholecystectomy. Our study concluded that ultrasonography is important tool not only for diagnosis of gall bladder pathology but for anticipating difficulties preoperatively which helped to plan for intraoperative management also. Most important thing is surgeon's skill. An experienced surgeon can manage all technically difficult gall bladders laparoscopically. Whereas, open surgery is the better option in some patients having reasons, frozen Calot's tringle, cholecysto-colic adhesions and no CBD/Bile duct explorations.

Keywords: Gall bladders, gall stones, complex cholecystectomy, laparoscopy, laparoscopic cholecystectomy

Introduction

Gallstone disease occurs in 3% to 20% of the population worldwide, the majority of whom remain asymptomatic. However, over any 10 years period 25% of these patients go to develop symptomatic disease and 3.5% have serious complications. The traditional management of acute calculus cholecystitis is initially conservative, allowing later elective cholecystectomy. While the majority of patients presenting with acute cholecystitis improve with conservative treatment, more than 20% of acute cholecystitis fail to resolve and necessitate an urgent cholecystectomy. Cholecystectomy during the "index" (acute) admission with acute cholecystitis therefore offers a one-admission definitive management approach, and is recommended. There is general agreement only when advance inflammation threatens the patient's life and urgent operation is a necessity. In other form of inflammation, it is possible to make an early cholecystectomy or proceed by conservative method. Early laparoscopic cholecystectomy is occasionally technically demanding, many surgeons are worried about excessive bleeding and inadvertent injury. However, the advantage of early cholecystectomy comprise a shorter time of treatment, lower costs of treatment because of one admission definitive treatment and total hospitalization. There is prevention of the development of serious complication such as empyema (mortality 10%). Another advantage is that the operation is technically relatively simple during the first week of the illness, edema making dissection of tissue planes easier. Now the advances have made

difficult cases to be treated laparoscopically. At present few scoring system present to predict difficulty. We worked out one such system predicting degree of difficulty intra operative Risk Score for conversion from laparoscopic to open cholecystectomy (RSCLO) as described by Kama (2001) ^[1].

Materials and Methods: In this prospective study, was conducted in the Department of surgery of Jawahar lal Nehru Medical College and Hospital, Bhagalpur and Nalanda Medical College and Hospital, Patna, Bihar, India, between October 2021 and September 2022. Total of 42 cases of complex gall bladder who underwent laproscopic cholecystectomy successfully, 2 males and 1female cases converted to open cholecystectomy as it was need of the time for betterment of patients. Definition of difficult cholecystectomy is inconsistent. Factors include difficult gall bladder that would.

Scores factors

- 3--Adhesions to gall bladder.
- 3-- Perforated gall bladder.
- 3--Repeated attacks of cholecystitis
- 3--Empyema
- 3--Thick wall
- 3--Previous GI surgery.
- 5--Portal Hypertension.
- 5--Anatomical Relations and variations.
- 5--Mirzi's syndrome

Difficulty level Score

- Difficult -----0-5
- Moderately difficult --5-10
- Very difficult ----- >10.

Difficult gall bladder defined as any two of the factors that are carrying up technical difficulty while dissecting gall bladder. Patients were evaluated on basis of clinical signs and ultrasonography-thickness of gall bladder, wall, number and size of stones, impacted stones in Harmann's pouch, pericystic fluid collection. Status of biliary tree: CBD-

1. Intrahepatic.
2. Extrahepatic.

Concomitant liver and pancreatic pathology. Colonic gasses. Whether colon is adhesions to gall bladder or not? Clinical signs like-abdominal pain, jaundice, dark coloured urine and gall bladder mass.

Results and Observations: Total of (42) forty two cases of difficult gall bladder who underwent laproscopic cholecystectomy successfully, 2males and 1female converted to open cholecystectomy. In our study most of the cases are from the age group 31-40i.e 11 cases (26%), followed by 41-50 i.e.7 cases (16.66%) female patients were more i.e. 23 cases (54.8%) than male i.e. 19 cases (45.2%) with female to male ratio 1:0.8.

Table 1: Preoperative data of cases

Male: Female Ratio	1:1.21
Association of Diabetes Mellitus	5
Repeated attacks of cholecystitis	5
Previous H/O surgery	3
Previous of ERCP	12

Table 2: Ultrasonography findings

Symptoms	Number of patients	%
Thick wall gall bladder	21	50
Impacted stone in HP	7	16.66
Liver cirrhosis	2	4.76
Portal hypertension	1	2.38
CBD pathology	3	7.14
Peri gall bladder fluid collection	2	4.76
Splenomegaly	2	4.76
Calculus cholecystitits	16	38.09
Gall Stone Pancreatitis	1	2.38
Colonic gases	0	0
Colonic adhesion to gall bladder	0	0

Table 3: Intraoperative findings

Symptoms	Number of patients	%
Thick wall gall bladder	18	50
Gall bladder Perforation	6	14.3
Gangrenous gall bladder	3	7.14
Gall bladder adhesions	21+5*+1 ⁰	61.9
Mirizzis Syndrome	1	2.38
Frozen Callot's	11	26.2
Gall bladder empyema	9	21.4
Impacted Stone at neck	6	14.3
Intra hepatic gall bladder	3	7.14
Anatomical relation and variations	1+1 ^u	4.8
Extensive bleed	0	0
Cirrhosis Liver	4	9.5
Liver Abscess	1	2.38
Drain Place	3	7.14
Mucocele of gall bladder	3	7.14
Sub hepatic Appendix	1	2.38
Posteriorly placed cystic artery	3	7.14
Gall bladder adherent to right HD	1	2.38

Duodenal Adhesion-*, Colonic Adhesion-0, Impacted Stone in CHD-u

Table 4: Mean Score

USG Mean score	OT Mean score	Total Mean score
7.14	12.58	20.27

Table 5: Sex wise Mean USG Score

Male USG Mean score	Female USG Mean score
6.83	7.44

Table 6: Procedure Performed

Parameters	Number of patients	%
Lap cholecystectomy	32	76.2
Lap subtotal cholecystectomy	5	11.9
Lap Partial cholecystectomy	1	2.4
Lap CBD Exploration with Lap cholecystectomy	0	0
Diagnostic laparoscopy	1	2.4
Conversion to open cholecystectomy	3	7.1

Table 7: Postoperative Complications

Parameters	Number of patients	%
Fever	2	5.5
Pulmonary edema	1	2.7
Billiary leak	1	2.7
Port site infection	2	5.5
Faecal fistula	1	2.7
Postoperative Jaundice	1	2.7

Postoperative jaundice was developed on day 4 of surgery and treated for choledocholithiasis by ERC.

DISCUSSION

Several studies has evaluated that risk factors for difficult laparoscopic cholecystectomy formed on basis of clinical preoperative findings, ultrasonography and perioperative findings. Schrenk preoperative and perioperative risk factors of conversion to open in 1300 patients that underwent lap cholecystectomy. They found that significant risk factors are, age>65, right hypochondriac region pain, increased gall bladder thickening of gall bladder wall, repeated episodes of cholecystitis and diabetes mellitus [2]. As compared to above studies our study also shows similar observation that 5cases (11.9%) patients were having diabetes mellitus which was associated with gangrenous gall bladder intraoperatively. Previous attack of cholecystitis in 5 cases (11.9%) patient. Alponate *et al.*, described four risk factors for difficult laparoscopic cholecystectomy increased wall thickness, increased total leucocyte count and increased

alkaline phosphatase level. They reported conversion were 1.5% when no risk factors and 9.3% in presence of only acute cholecystitis and 58% in all four risk factors^[1,2]. In comparison to Alponate *et al.*, study our study also shown similar observations that 5 cases (11.9%) patients were having attack of acute cholecystitis and it was found that there was difficulty during operative procedure due to the cholecystitis.

USG Findings: Ultrasonography (USG) is very important tool not only for diagnosis gallbladder pathology but also predicting the difficulty during surgery^[3]. In our study ultrasonography helps as an important tool that have helped in anticipating difficulty preoperatively and on ultrasonography ground, we could plan for standard protocol management. In our study it was found that on ultrasonography thick wall gall bladder in 50% patients. Calculus cholecystitis in 41%, impacted stones in Hartmanns pouch in 16.66%, peri gallbladder collection in 5.5%, gallbladder empyema in 25% cases. In 2.7 % gall stones pancreatitis was observed. During operation it was observed that 66.6% of patients had gall bladder adhesions, gall bladder perforation in 16.66%, impacted stones in Hartmann's pouch in 16.66%, frozen Calot's triangle 27.77%, gallbladder empyema in 25%, cirrhosis of liver in 11.11%. Abdominal ultrasonography. Our study allowed for determination of preferentially intraoperative technical difficulties, however open conversion was needed in 3(7.1%) patients 2 males and 1female cases, having reasons, frozen Calot's tringle, cholecysto-colic adhesions and no CBD/Bile duct explorations.

Intraoperative findings: In our study intraoperative difficulties encountered were gallbladder adhesions with omentum 18 cases (66.66%), 5 cases having duodenal adhesions to gallbladder and one patient was having colonic adhesions. In our study it was found that 14 (58.88%) patients were having thick wall gallbladder which caused difficulty for retraction of gallbladder. Frozen Calot's triangle found in 10 (27.77) patients which caused significant difficulty in dissecting cystic artery and cystic duct as it obscured anatomy. In 6 (16.66%) patients impacted stones at neck of gallbladder and resultant distended gallbladder was found. We found easy way to handle such hugely distended gallbladder by pocking up with 5mm trocar and suctioning it and remove gallbladder with stone after decompressing it by suctioning. Gallbladder empyema was found to be either due to impacted stone or due to infection in 9 (25%) patients. Gallbladder perforation is major intraoperative, finding which was difficult to manage laparoscopically. Marks Shafer *et al.*, observed intraoperative complication in 24 out of 159. They were gallbladder perforation (16), bleeding (4), perforation of transverse colon and atrial fibrillation (37)^[4]. As compared to Marks Shafer *et al.*, study we found 6 cases (16.66%) perforated gallbladder, none of case having severe intraoperative bleed. we did not find atrial fibrillation or colonic perforation in a single case in our study. All these cases successfully completed laparoscopically, however few of them converted to laparoscopic subtotal cholecystectomy or laparoscopic partial cholecystectomy and 3(7.1%) patients need to be converted to open cholecystectomy.

Conversion to standard protocol or open conversion: Simpolous *et al.*, reviewed retrospectively the record of 1,804 patients who underwent cholecystectomy from May 1992 to Jan 2004, conversion to open needed in 94 patients (5.2%), of which 44 (2.8%) had no inflamed and 50 (2.77%) had acute inflammation of gall bladder. They concluded that none of risk factors were contra indication to laparoscopic cholecystectomy^[5]. This may predict the difficulty of procedure and permit surgeon to inform patients about risk of conversion from laparoscopic to open procedure. In our study 32 (76.2%) patients underwent laparoscopic cholecystectomy successfully but some of them 4 (11%) patients needed conversion to other standard protocol like laparoscopic subtotal cholecystectomy and one case (2.72%) laparoscopic partial cholecystectomy and open conversion was needed in 3(7.1%) patients 2 males and 1female cases, Laparoscopic cholecystectomy with laparoscopic CBD exploration done not done in our study. One patient was planned for diagnostic laparoscopy for suspicious appendicular perforation but it was found that gall bladder was perforated. However open conversion was needed in 3(7.1%) patients 2 males and 1female cases, having reasons, frozen Calot's tringle, cholecysto-colic adhesions and no CBD/Bile duct explorations.

Postoperative complications: There were no bile duct injuries or death in all the studied cases. However, fever was present in 2(5.5%) patients and one patient (2.77%) developed pulmonary edema on postoperative day 2 and was managed in Intensive care unit. One (2.71%) patient underwent partial cholecystectomy developed biliary leak on post-operative day 10 and was managed by placing drain under ultrasonography guidance. One patient is having fecal fistula (2.77%) which got healed with conservative management. Obstructive jaundice was developed in one (2.77%) patients only on postoperative day 5 which was treated with ERCP. However, all the complications we managed conservatively no re-exploration needed.

Conclusion

Laparoscopic cholecystectomy is a safe procedure for gall stone diseases. However, some patients need

conversion to standard protocol like Laparoscopic subtotal cholecystectomy and laparoscopic partial cholecystectomy and Open cholecystectomy, whichever is best suited for the patients at times. Our study concluded that ultrasonography is important tool not only for diagnosis of gall bladder pathology but for anticipating difficulties preoperatively which helped to plan for intraoperative management also. Most important thing is surgeon's skill. An experienced surgeon can manage all technically difficult gall bladders laparoscopically. Whereas, open surgery is the better option in some patients having reasons, frozen Calot's triangle, cholecysto-colic adhesions and no CBD/Bile duct explorations.

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