

## A Study of Post-Operative Complications Following Open and Laparoscopic Cholecystectomy and its Management

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### ABSTRACT

Gallstones are the most common biliary pathology. The incidence of biliary calculous disease varies widely throughout the world. Gallstones are composed mainly of cholesterol, bilirubin, and calcium salts, with smaller amounts of protein and other materials. In Western countries cholesterol is the principal constituent of more than three quarters of gallstones, and many of these stones are more than 80 percent cholesterol. Non-cholesterol stones are categorized as black or brown pigment stones, consisting of calcium salts of bilirubin. The present study was the various complications of lap laparoscopic cholecystectomy and he management of the same.

**Key words:** Laparoscopic Cholecystectomy, Cholesterol

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### INTRODUCTION

Gallstones are among the most common gastrointestinal illness requiring hospitalization with a prevalence of 11% to 36% in autopsy reports. The optimal treatment for patients with symptomatic cholelithiasis is cholecystectomy. Laparoscopic cholecystectomy is the procedure of choice for the majority of patients with gall bladder disease. These postulated advantages of laparoscopic cholecystectomy are the avoidance of large incision, shortened hospital stay and earlier return to work [1-5].

### MATERIALS AND METHODS

The present study was conducted on 55 patients of gallbladder disease admitted for cholecystectomy in whom 30 laparoscopic cholecystectomies and 25 open cholecystectomies was done. All the patients were selected at random.

#### Inclusion criteria

- ✓ All patients with symptomatic cholelithiasis (including acute cholecystitis).

- ✓ Patients presenting with acalculous cholecystitis.

- ✓ Age > 18 years.

#### Exclusion criteria

- ✓ Carcinoma of gall bladder.
- ✓ Perforated gall bladder
- ✓ Patients unfit for general anesthesia.
- ✓ Previous upper abdominal surgery.
- ✓ Age < 18 years.

The general bio-data of patient regarding his name, age, sex, religion, occupation, socio-economic status and address was collected. A detailed history was taken with special reference to duration of right upper quadrant pain or epigastric pain, its periodicity, its aggravation by fatty meals and relief by oral or parenteral analgesics. Any significant history was also enquired. A relevant general physical examination, abdominal and systemic examination was done. Pre-operative work up included a complete blood count, blood sugar, blood urea, serum creatinine, liver function tests, hepatitis profile, X-ray chest and ultrasound of abdomen. Ultrasonogram was routinely performed on all patients to confirm the clinical diagnosis of cholelithiasis with number of

calculus and size of calculus, gallbladder wall thickness (>4mm was considered abnormal), pericholecystic collection and CBD calculi or dilatation of CBD. routine pre-anaesthetic checkup was done.

## RESULTS

A prospective study was carried out in the Department of General Surgery, during the period from November 2014 to September 2016 in 30 patients undergoing laparoscopic cholecystectomy and 25 open cholecystectomies. The patients belonged to various surgical units in Sree Balaji Hospital and full details of the patients were recorded in the proforma. Observations and analysis of all the parameters studies are as follows.

The present study was conducted to evaluate the intra and post-operative problems & complications encountered during laparoscopic cholecystectomy. The study was conducted on 30 patients. All patients underwent clinical examination, relevant hematological and biochemical investigations, and ultrasonographic investigation of hepatobiliary tract. The observations thus made were analyzed and recorded as follows:

### Age incidence

The mean age in this study was 43.4 years. The age group of the patients ranged from 21 years to 79 years. The maximum incidence is seen in the age group of 41-50 years followed by 31-40 years of age. 75% of patients belonged to ages between 31 and 60 (Table 1).

### Sex incidence

The ratio of males to females 1:2. The above sex distribution shows that the gall bladder diseases have a higher frequency in female than in males (Table 2). Clinical presentation and associated symptoms are mentioned in Table 3 and Table 4.

In the present study, 9 patients (30%) were admitted through emergency and were diagnosed to be suffering from acute cholecystitis. Twenty-

one (70%) patients were admitted for routine elective laparoscopic cholecystectomy without any symptoms/ signs of acute cholecystitis (Table 5).

Intra-operatively dense adhesions were found in 8 patients (26.67%). Thick-walled gallbladder was present in 7 patients (23.33%). Anatomy of Calot's triangle was obscure in two patients (6.67%) and there was sessile gallbladder in one patient (3.33%). Technical failure due to malfunctioning of CO2 insufflators occurred in 1 patient (3.33%) (Table 6).

In one patient (3.33%) there was bleeding from cystic artery. However, it was possible to clip the artery in this case and conversion was not required. This was seen in case having dense adhesions at the Calot's triangle. The perforation of gallbladder with spillage of stones occurred in one patient (3.33%). All the stones were taken out and peritoneal lavage was done. This happened in the case having sessile & thick-walled gallbladder (Table 7).

Wound infection in our study, 3 patients (10%) developed wound infection with mild discharge in the postoperative period. All the three patients were those converted into open cholecystectomy during surgery because of intra-operative problems. Pus C/S swabs was taken from the wound and appropriate antibiotics were given. The wounds healed by antibiotics and removal of offending stitch. Fever 3 patients (10%) developed fever in the immediate post-operative period. 2 of these were those converted into open cholecystectomy during surgery because of intra-operative problems while one patient had undergone a successful laparoscopic cholecystectomy. Intra-abdominal collection There was no case of post-operative intraabdominal collection in our study. Jaundice There was no case of post-operative jaundice in our study. Hernia All the patients were followed up for 3 months and there was no case of incisional hernia in our study (Table 8). Complications of open cholecystectomy are mentioned in Table 9.

Table 1: Age incidence.

Age group	No. of patients	Percentage%
21-30	9	16.90%
31-40	15	26.70%
41-50	17	30.30%
51-60	10	18.70%
61-70	3	5.30%
71-80	1	1.70%

Table 2: Sex incidence.

Gender	No of patients	%
Male	18	32%
Female	37	68%

Table 3: Clinical presentation.

Presentation	No of cases	%
Epigastric pain	19	31.20%
Right hypochondrium pain	36	68.75%

Table 4: Associated symptoms.

Symptoms	No of cases	%
Nausea	3	5.30%
Vomiting	8	14.20%
Nausea+Vomiting	11	20.50%
Jaundice	5	8.90%

Table 5: Cases of acute cholecystitis.

Diagnosis	Number	%
Acute cholecystitis absent	21	70%
Acute cholecystitis	9	30%
Total	30	100%

Table 6: Intra-operative problems.

S. No	Intra operative problems	No of patients	%
1	Dense adhesions	8	26.67
2	Thick-walled gall bladder	7	23.33
3	Obscure anatomy in calots triangle	2	6.67
4	Sessile gallbladder	1	3.33
5	Technical failure	1	3.33

Table 7: Intra-operative complications.

Intra operative complications	No of patients	%
Bleeding from cystic artery	1	3.33%
Perforation of gallbladder with spillage of stones	1	3.33%

Table 8: Post-operative complications.

Post-operative complication	Total no of patients	Percentage	Successful	Converted
Wound infection	3	10%	2	1
Fever	3	10%	1	2
Intra-abdominal collection	-	-	-	-
Mortality	-	-	-	-
Jaundice	-	-	-	-
Hernia	-	-	-	-

Table 9: Complications of open cholecystectomy.

Complications	Frequency
Difficulty in anatomy	3
Bleeding from incision site	1
Vascular injury	2
Injury to CBD	1
Dropped stones into peritoneum	1
Perforation of gallbladder	1
Bile leak in drain	3
Fever	2
Pain at incision site	5
Wound infection	6
Chest infection	4
Wound dehiscence	2

## DISCUSSION

Laparoscopic cholecystectomy is the established treatment for symptomatic cholelithiasis. It is associated with less painful post-operative course, a low analgesic requirement and a short hospital stay. The current study was done to evaluate the intra-operative and post-operative problems & complications encountered during laparoscopic cholecystectomy in 30 patients presenting to the department of general surgery. Intra-operative complications Most common source of bleeding during laparoscopic cholecystectomy is injury to the cystic artery or its branches. Other causes of bleeding could be from the gallbladder bed, liver capsule, inflamed gallbladder, hemorrhagic adhesions, injury to vessels (while first trocar insertion) [6-9]. Peter's et al. [10] reported that intra-operative complications occurred in 12 patients of their series of 746 patients. In the present study there was bleeding from cystic artery in 1 patient (3.3 3%) which was clipped without the need for conversion. The gallbladder wall may be punctured while using diathermy or scissors. Excessive traction on the gallbladder particularly by the forceps grasping the fundus may lead to tearing of the gallbladder. Rupture may occur during extraction particularly if it packed with stones. This complication can be avoided by minimum traction on the gallbladder; use of diathermy should be minimal, when extracting the gallbladder from the peritoneal cavity steady traction without excessive force should be applied. It is important to apply diathermy in correct plane between gallbladder and liver. Safe use of diathermy requires careful visualization of the tissue to be coagulated by the hook dissector described by Dunn and Watson, 1992 as hook, look, cook||. The use of monopolar cautery should be avoided in Calot's triangle because of important structures in the vicinity. In the present study also, there was technical problem of gallbladder injury with spillage of the stones in one patient. These stones were retrieved by extraction with a grasping forceps and laparoscopic suction. The procedure was completed without conversion. Retrieval of spilled stones can be done by pressure ejection, laparoscopic hovering and use of retrieval bags. The complications arising from dropped gallstones in laparoscopic cholecystectomy patients are subsequent abscesses and inflammatory masses containing gallstones or

stone fragments [11-19]. Dulemba et al. [20] reported that spilled stones floating free in the peritoneal cavity may migrate to the pelvic area and become embedded there in the cul-de-sac, causing a severe reaction. Due to the subsequent inflammatory reaction, the fertility may be adversely affected in a female [21]. Post-operative complications Wound Infection in our study, 3 patients (10%) developed wound infection with mild discharge in the postoperative period, were treated with broad spectrum anti biotic Williams et al [22] reported wound infection rates of 0.5% in successfully performed laparoscopic cholecystectomies and infection rate of 3.6% in patients requiring conversion. Similarly, others concluded that small biological impact induced by laparoscopy is followed by a greater preservation of the immune response as compared to the open procedure, thus lowering the incidence of infectious complications. Three patients (10%) developed fever in the immediate post-operative period. Two of these patients were those who were converted to open cholecystectomy because of intra-operative problems while one patient had successfully undergone laparoscopic cholecystectomy. 1 of the patients of acute cholecystitis undergoing laparoscopic cholecystectomy developed fever in the immediate post-operative period which remained only for 1 day. The fever was associated with wound infection in both the cases of open cholecystectomy. The fever got relieved by giving anti-pyretics and appropriate treatment of the wound infection. Post-operative pain Mechanism of pain. Factors that may influence the degree of pain after laparoscopic cholecystectomy include the volume of residual gas, the type of gas used for pneumoperitoneum, the pressure created by the pneumoperitoneum and the temperature of insufflated gas. The length of operation and volume of insufflated gas may be a more important factor than the duration of exposure. The rate of insufflation of carbon dioxide also influences the incidence of post-operative shoulder tip pain with lower rates of insufflations resulting in lower rates of shoulder tip pain. Another mechanism may be the formation of intra-peritoneal carbonic acid from carbon dioxide. Thus, the origin of pain after laparoscopic cholecystectomy is multifactorial, with Gill HS et al., Sch. J. App. Med. Sci., June 2016; 4(6 B):1946-1952 1951 pain arising from the incision sites, the pneumoperitoneum and the

cholecystectomy. David concluded that benefits of laparoscopic cholecystectomy include shorter hospital stay, less pain, quicker return to normal activities and improved cosmetic outcome. In the present study, 2 patients had severe pain post-operatively and they were cases who required conversion to open cholecystectomy because of intraoperative problems. However, these results were found to be statistically non-significant. This may be due to the small sample size with which the present study was undertaken. Intra-abdominal collection There was no case of post-operative intraabdominal collection in our study. This was due to routine aseptic precautions taken during surgery. Mortality There was no mortality during the operation or in the post-operative period in our study. Jaundice There was no case of post-operative jaundice in our study. Hernia All the patients were followed up for 3 months and there was no case of incisional hernia in our study. Duration of hospital stay In the present study, the patients undergoing conversion into open cholecystectomy had mean hospital stay of  $9.50 \pm 1.37$  days which was greater than mean hospital stay of patients who underwent successful laparoscopic cholecystectomy ( $3.29 \pm 1.23$  days). This difference in hospital stay was found to be statistically highly significant. 50% of the patients in the study had a hospital stay  $\leq 3$  days. All these patients had successfully undergone laparoscopic cholecystectomies [23]. Similarly, Porte and DeVries [24] reported that mean hospital stay after laparoscopic cholecystectomy was 3 days as compared to 7 days for those who required conversion to open cholecystectomy. Most common complication Following open cholecystectomy is wound infection for which broad spectrum anti biotic followed by pain at the incision site treated with analgesics and chest infection, which was treated with antibiotics and chest physiotherapy, three patients had bile leak which reduced spontaneously after post-operative day 3.

### CONCLUSIONS

Most common complication following open cholecystectomy is wound infection for which broad spectrum anti biotic followed by pain at the incision site treated with analgesics and chest infection which was treated with antibiotics and chest physiotherapy, three patients had bile leak which reduced spontaneously after post-

operative day 3.

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### ETHICAL APPROVAL

The study was approved by the Institutional Ethics Committee.

### CONFLICT OF INTEREST

The authors declare no conflict of interest.

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### REFERENCES

1. Narhwold D. Biliary system. Sabiston text book of surgery, 13<sup>th</sup> Edn. WD. Saunders Company, Philadelphia, 1986; 1128-37.
2. Kimberley DS, Joe AC, Joel L. Pathogenesis of gallstones. Surg Clin N Am 1990; 91:601-604.
3. Andrew KD. Epidemiology and natural history of gallstone disease. Gastroenterology Clin N Am 1991; 20:1-19.
4. Dubious F, Barthelot G. Cholecystectomie parminilaprotomie retracted by Assalia A, Schein M, Kopelman D, et al. In: World J Surg., 1993; 17:755-759.
5. Goco IR, Chambers LG. Minicholecystectomy and operative cholangiography. A means of cost containment. Am Surg 1983; 78:143-145.
6. Singh DP, Singh S. Small incision cholecystectomy. Surgery 1998; 4:43-45.
7. David R. Laparoscopic cholecystectomy. Maingot's Abdominal Operations. Appleton Century Croft's, New York. 10th Ed., 1997; 2:1855-1865.
8. Assalia A, Schein M, Kopelman D, et al. Minicholecystectomy vs. conventional cholecystectomy. A prospective randomized trial— Implications in the laparoscopic era. World J Surg 1993; 17:755-759.
9. McMahon AJ, Baxter JN, Anderson JR, et al. Laparoscopic versus minilaparotomy cholecystectomy. A randomised trial. Lancet 1994; 343:135-138.
10. Peters JH, Krailadsiri W, Incarbone R, et al. Reasons for conversion from laparoscopic to open cholecystectomy in an urban teaching hospital. Am J Surg 1994; 168:555-559.
11. Schrenk P, Woisetschlager R, Rieger R, et al. A diagnostic score to predict the difficulty of a laparoscopic cholecystectomy from preoperative variables. Surg Endoscopy 1998; 12:148-150.

12. Jansen S, Jorgensen J, Caplehorn J, et al. Preoperative ultrasound to predict conversion in laparoscopic cholecystectomy. *Surg Laparoscopy Endoscopy Percutaneous Techniques* 1997; 7:121-123.
13. McMahon AJ, Baxter JN, Anderson JR, et al. Laparoscopic versus minilaparotomy cholecystectomy: a randomised trial. *Lancet* 1994; 343:135-138.
14. Gadacz TR, Talamine MA, Lillemoe KD. Laparoscopic cholecystectomy. *Surg Clin North Am* 1990; 70:1249-1262.
15. Dinkel HP, Kraus S, Heimbucher J, et al. Sonography for selecting candidates for laparoscopic cholecystectomy: A prospective study. *Am J Roentgenol* 2000; 174:1433-1439.
16. Verma GR, Bose SM, Wij JD. Pericholecystic adhesions in single versus multiple gallstones and their consequences for laparoscopic cholecystectomy. *J Laparoendosc Adv Surg Tech A* 2001; 11: 275-279.
17. Cuschieri A, Dubois F, Mouiel J. The European experience with laparoscopic cholecystectomy. *Am J Surg* 1991; 161:385.
18. Harvey MH, Pardoe H. Retrieval of spilled stones during laparoscopic cholecystectomy. *Br J Hospital Med* 1994; 52:439-442.
19. Morrin MM, Kruskal JB, Hochman MG, et al. Radiologic features of complications arising from dropped gallstones in laparoscopic cholecystectomy patients. *Am J Roentgenol* 2000; 174:1441.
20. Dulemba JF. Spilled gallstones causing pelvic pain. *J Am Assoc Gynae Laparoscopists* 1996; 3:309.
21. Volz J, Köster S, Weis M, et al. Pathophysiologic features of a pneumoperitoneum at laparoscopy: a swine model. *Am J Obstetr Gynecol* 1996; 174:132-140.
22. Williams LF, Chapman WC, Bonau RA, et al. Comparison of laparoscopic cholecystectomy with open cholecystectomy in a single center. *Am J Surg* 1993; 165:459-465.
23. Targarona EM, Balague C, Knook MM, et al. Laparoscopic surgery and surgical infection. *Br J Surg* 2000; 87:536-544.
24. Porte RJ, DeVries BC. Laparoscopic versus open cholecystectomy: A prospective matched-cohort study. *HPB Surg* 1996; 9:71-75.