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Original Research Paper

General Surgery

THE STUDY OF LAPAROSCOPIC CHOLECYSTECTOMY AND ITS CONVERSION TO OPEN CHOLECYSTECTOMY– ANALYSIS OF 1477 CASES IN I.Q CITY MEDICAL COLLEGE, DURGAPUR, WEST BENGAL

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ABSTRACT

BACKGROUND: Laparoscopic cholecystectomy has now become gold standard option instead of open cholecystectomy for the treatment of cholelithiasis. Over the past two decades, laparoscopic cholecystectomy has become the choice for the surgical treatment of gall bladder disease and cholelithiasis condition. Some patients require conversion to open surgery and several variables have been identified as risk factors that are helpful in predicting the probability of conversion as well as common causes of conversion.

AIMS AND OBJECTIVE: This study was planned to identify the circumstances and the risk factors influencing the conversion of laparoscopic cholecystectomy to open procedure.

METHODS AND MATERIALS: This is a prospective study conducted over a period of 5 years. A total of 1477 patients who were electively posted for laparoscopic cholecystectomy among which 80 patients got converted in to open cholecystectomy were included in the study. The factors recorded and analysed were age and sex of the patients, presence of diabetes mellitus and previous episode of acute cholecystitis.

RESULT: In our study, it has been observed Patient Related Factors- Adult age group, Male gender, Presence of Diabetes Mellitus, Obesity, Previous Abdominal Surgeries, and disease related factors- previous episode of acute cholecystitis, gall bladder wall thickness >4 mm, presence of pericholecystic fluid were found to be significant risk factors in conversion of laparoscopic to open cholecystectomy.

CONCLUSION: The risk factors help to predict the difficulty of the procedure and this would permit the surgeon to better inform patients about the risk of conversion from laparoscopic to open cholecystectomy.

KEYWORDS : Cholelithiasis, Laparoscopic cholecystectomy, conversion, risk factors.

INTRODUCTION

Laparoscopic Cholecystectomy (LC) was first reported in Germany (1985) and France (1987) more than two decades ago [1, 2]. Although not immediately universally adopted, Laparoscopic cholecystectomy has revolutionized minimally invasive surgery [3, 4]. The appeal of diminished pain and fatigue, early return to normal activities and superior cosmesis has made it a popular surgery [5]. Introduction of laparoscopic cholecystectomy techniques has made a revolution in gastro intestinal surgery in recent years. Langenbach in 1892 done the first cholecystectomy but the first successful laparoscopic cholecystectomy was done in 1985 by Eric Muhe [6]. Two years later, Philip Mauret improved the method, over the past two decades laparoscopic cholecystectomy has become gold standard for the surgical treatment of gall bladder disease. The advantages of laparoscopic cholecystectomy over open surgery are a shorter hospital stay, less post operative pain, a quicker return to work, less morbidity, faster recovery and better cosmesis [7]. Minimal invasive surgery, cure and safety of patients are the priority of the modern surgical method. Laparoscopic cholecystectomy has proved and increased the importance of minimal access. It is very safe and easy because of better magnification. Now a day's conversion rate to open cholecystectomy is reduced. Even difficult laparoscopic cholecystectomy has been performed successfully without complication. Certain factors determining conversion of laparoscopic to open in today's set up are previous surgery leading to dense adhesion, bile duct or cystic duct injury, bleeding from cystic artery or liver fossa, carcinoma of gall bladder, post operative difficult adhesion and patients with choledocholithiasis which has failed in endoscopic extraction of stones. Such difficult cases are still challenge to trained laparoscopic surgeon. In early days of laparoscopic cholecystectomy the conversion rates were very high. As the expertise grew, quality hardware and software introduced, the rate of conversion came down to 0-20% which is still high. In our country patients with gall bladder disease come for treatment only after several attacks and quite late. This may be the one of the factors causing higher conversion rates in our study.

Grading of laparoscopic cholecystectomies was done from 'A' to 'E' categories. The grades are as follows:

Grading of Laparoscopic Cholecystectomies.

1. Laparoscopic cholecystectomy done without difficulty clear calot's triangle.
2. Laparoscopic cholecystectomy done with flimsy adhesion due to previous cholecystitis attack but calot's triangle is clear.
3. Laparoscopic cholecystectomy done in cases with dense adhesion in calot's triangle dissected with difficulty with electrocautery or aqua dissection.
4. Conversion to open cholecystectomy after Laparoscopic cholecystectomy due to various reasons. (a) Dense adhesion (b) mass formation (c) Acute cholecystitis (d) Empyema or gangrenous gall bladder (e) distorted anatomy and (f) ca gall bladder.

Conversion should not be considered a technical failure but rather accepted as a better surgical practice for the patient and by the surgeon when indicated [8]. Carbon Dioxide and elevated intra abdominal pressure due to pneumoperitoneum has potential harmful intra operative circulatory and ventilator effects are assumed to be deleterious for high risk patients ASA III and IV [9]. Despite the tremendous impact of laparoscopic cholecystectomy on the management of biliary pathology, however surgeons continue to face challenges in application of laparoscopic cholecystectomy in daily practice. Laparoscopic cholecystectomy today can be as straight forward operation, but may also be an operative approach fraught with underline complexities necessitating conversion, leading to longer operative time, longer hospital stay and most post operative morbidity and higher hospital costs [10, 11].

AIMS AND OBJECTIVE

This study was planned to identify the circumstances and the risk factors influencing the conversion of laparoscopic cholecystectomy to open procedure.

MATERIAL AND METHODS

Study Design

This is a retrospective cross sectional descriptive study at I.Q City Medical College and Hospital, Durgapur, West Bengal by the department of General Surgery over a period of more than 5 years. A written informed consent was taken from all patients before their inclusion in the study. The study was approved by the institutional ethical committee of the college and hospital and all the procedures were conducted in accordance to the ethical guidelines. A complete study was done and analyzed regarding the patients undergoing laparoscopic cholecystectomy and the conversion rates to open cholecystectomy among them.

SAMPLING

A total of 1477 patients who were electively posted for laparoscopic cholecystectomy among which 80 patients got converted in to open cholecystectomy were included in the study. All the patients were kept nil by mouth over night prior to surgery and were given doses of prophylactic antibiotics one hour prior to surgery. All the patients were asked to evacuate the bladder before surgery. All the surgeries were performed under general anaesthesia by the surgical team consisting of consultants and residents.

SELECTION CRITERIA

Inclusion Criteria:-

The study subjects were patients admitted with diagnosis of symptomatic cholelithiasis who subsequently underwent cholecystectomy at tertiary hospital from November 2013 to December 2018. (**20/11/13 to 31/12/18) i.e. > 5 yrs**. Patients with acute calculus cholecystitis, proven by 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 following conditions were excluded from the study:

1. History of prior upper abdominal surgery.
2. History or investigations suggesting CBD stones.

Conversion to Open Cholecystectomy.

When required, the conversion to open cholecystectomy was made on instant basis without prolonging operative time. The reason for conversion, as stated in operative report and database entry, were compiled. Causes for conversion were stratified in to the following categories: adhesion in calot's triangle, bleeding and acute inflammatory changes, etc.

STATISTICAL ANALYSIS

For statistical analysis, descriptive statistics was used and data was analyzed using SPSS Software version 21.0. To evaluate the association between predictor variables and sex, the chi-square and Fishers Exact test were used. $P \leq 0.05$ was considered statistically significant.

RESULT

A total of 1477 patients were enrolled for laparoscopic cholecystectomy, 80 patients (5.41%) converted to open cholecystectomy, whereas there were 32 Females and 48 Males in the laparoscopic group. Majority of patients belong to age group of 40-60 years. Most of our patients belong to ASA II, ASA III, and ASA IV categories in laparoscopic cholecystectomy groups, whereas in converted group only ASA III and ASA IV categories. All Procedures were done by the same surgical team.

Table-1: Conversion rate.

Procedure	Total no. of cases	No. of cases completed by laparoscopy	No. of cases converted to open	Conversion rate.
No.of patients	1477	1397	80	5.41%

Table-2: Intra operative findings and their percentage.

Intra operative findings and causes	No. of cases	Percentage (%)
Extensive Adhesion and Distorted Anatomy	48	60
Acute Cholecystitis	21	26.25
Alarming Bleeding	5	6.25
CBD Stone and CBD injury.	5	6.25
Mirrizi's Syndrome	1	1.25

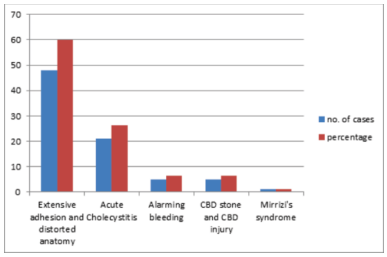
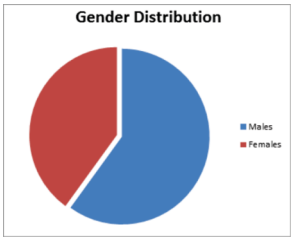


Table-3: Gender Distribution.

Gender	No. of Patients	Percentage (%)
Female	32	40
Male	48	60
Total	100	100



DISCUSSION

Conversion to open surgery from laparoscopic cholecystectomy was encountered because of recurrent management of multiple episodes of acute cholecystitis and avoiding definitive surgery because of associated co morbidities. It is considered as sound judgement to avoid complications and reduce morbidity [11, 14]. The identification of risk factors for conversion helps in predicting the rate of conversion and counselling the patients accordingly. Elderly age is itself high risk for laparoscopic cholecystectomy and conversion to open cholecystectomy. Patients above 60 years showed a higher tendency towards conversion. [15, 16]. The actual rates of conversion reported in literatures are quiet variable ranging from 0% to 20% [17]. Conversion from laparoscopic to open cholecystectomy is required when safe completion of the laparoscopic procedure cannot be ensured. It is considered as a sound judgment rather than failure of laparoscopic surgery to avoid complications and reduce morbidity. The identification of parameters predicting conversion helps in preoperative patient counselling, provides for better preoperative planning and avoids laparoscopy associated complications by converting to open procedure as and when appropriate [18- 21]. In our study it has been observed that patient related factors- Age >50yrs. , Male gender, presence of diabetes mellitus, obesity, previous abdominal surgeries and disease related factors – previous episode of acute cholecystitis, gall bladder wall thickness >4 mm, presence of pericholecystic fluid were found to be significant risk factors in conversion of laparoscopic to open cholecystectomy. In 1994, Fried et al published a study suggesting that the most significant predictors of conversion were increasing age, obesity, thickened gall bladder wall by pre-operative ultrasound and acute cholecystitis. Male sex was also one of them [22]. Harris studied 100 open/100 Laparoscopic cholecystectomy and found that morbidity was 9% and mortality was 1% in Laparoscopic cholecystectomy as

compared to open cholecystectomy where morbidity was 13% and mortality was 2% [23]. Koperna has done study of acute cholecystitis in 49 patients for each procedure and found conversion rate 44.9% [24].

CONCLUSION

The identification of the parameters as age, high risk, co morbities, American society of anaesthesiologist status and others helps in predicting the conversion rate and counselling the patients about post operative complications. Among the intra operative findings that resulted in conversion, adhesion dominated the scene followed by acute inflammatory changes and bleeding. Moreover surgeons should lower their thresholds for conversion to open cholecystectomy in these high risk Patients when laparoscopic difficulty begins to compromise patient's safety, especially in patients with cardio pulmonary dysfunctions.

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