

To Find Out Various Pre-Operative and Intra-Operative Factors Affecting Non-Biliary Complications During Laparoscopic Cholecystectomy and Their Outcome.

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Abstract

Background: To find out various pre-operative and intra-operative factors affecting non-biliary complications during laparoscopic cholecystectomy and their outcome.

Patients and Methods: This study presents analysis of non-biliary complications which occurred during laparoscopic cholecystectomy performed in the dept. of surgery in JAH, Gwalior. The study population included patients with biliary lithiasis in whom laparoscopic cholecystectomy was done. The non-biliary complications were divided into two broad subsets: (i) complications during access and (ii) complications during procedure.

Results: The proportion of non-biliary complications during LC was 18.18%, biliary complications were 2.27% and conversion rate to open procedure was 12.73%. Preoperative factors showing definitive association with non-biliary complications during LC were high BMI, positive history of previous abdominal surgery, tenderness in right hypochondrium, thickened & contracted GB on USG and adhesions at calot's triangle intraoperatively while factors which showed no definitive association were age, gender and palpable GB per abdomen.

Conclusion: Non-biliary complications occur much more frequent than biliary complications and were a significant cause morbidity and mortality in patients undergoing laparoscopic cholecystectomy. The need for conversion of laparoscopic cholecystectomy to open approach keeping in mind these pre-operative and intra-operative factors should not be taken as a failure or a complication, but perceived as an attempt to avoid the undue complications.

Keywords: Laparoscopic cholecystectomy, non-biliary complications

I. Introduction

Cholecystectomy is the treatment of choice for symptomatic cholelithiasis. It is currently one of the commonest reasons for admission to hospital with an associated mortality of 0.45 to 6% depending on severity of gallbladder disease. It accounts for a significant workflow in gastrointestinal surgery and emergency care. Optimizing care and care pathways requires an understanding of the underlying disease⁶². Not only can the natural history of gallbladder disease vary with patient cohorts but surgical findings can be surprising, with somewhat unexpected degrees of surgical difficulty (or ease). Even though laparoscopic cholecystectomy (LC) has become the customary method for treating gallstones, some incidents and complications appear rather more frequently than with the open technique. Several aspects of these complications and their treatment possibilities are analysed.

Although these complications are not as common as they were in the past, but are still a major source of morbidity associated with laparoscopic cholecystectomy. Laparoscopic approach can be technically difficult in some patients with a certain set of complications which include biliary and nonbiliary ones of which nonbiliary complications are under reported which if identified pre-operatively or early during the surgery can certainly reduce the incidence of these avoidable complication. Thenon-biliary complications can be divided into access-related or procedure-related. In our study, we will try to ascertain various pre-operative and intraoperative factors affecting their occurrence and outcome.

Patients and Methods

The present study entitled "various pre-operative and intra-operative factors affecting non-biliary complications during laparoscopic cholecystectomy and their outcome" was conducted on 220 patients of biliary lithiasis in the Department of Surgery, JA Group of Hospitals and GR Medical College, Gwalior (MP) during September 2015 to August 2016 after getting written informed consent from the patients. The study population included all patients with symptomatic cholelithiasis who were PAC (Pre- anesthetic checkup) fit regardless of

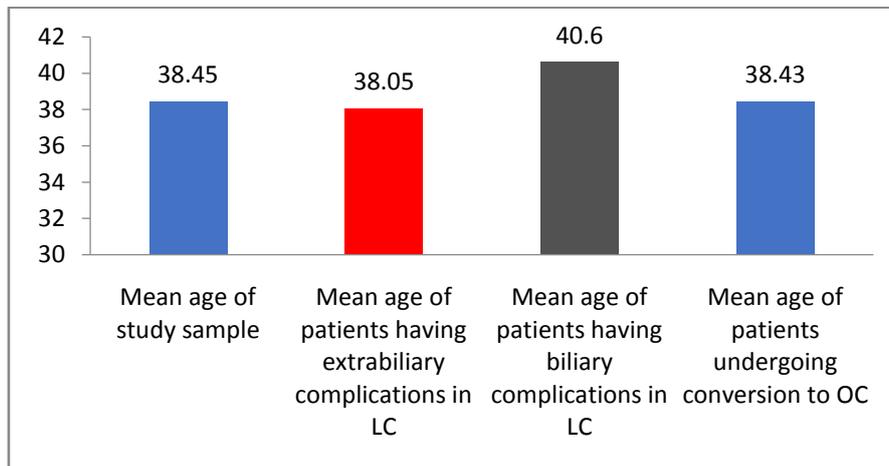
their age and gender. The patients were operated by four-port technique and pneumoperitoneum was created by verres needle.

All preoperative & intra operative details were recorded on a proforma and results were subsequently analyzed by SPSS 23.

II. Results

The study sample had 59 males and 161 females among the patients showing female preponderance of cholelithiasis. the mean age of the study sample was 39.42 years and 38.09 years for male and females respectively ranging from 18 years to 70 years in different patients. the mean age for the patients having nonbiliary complications in LC was 38.05 (± 11.36) years while for those having an uneventful LC was 38.53 (± 12.41) years. Which had no significance with p-value of 0.819.

Graph 1 shows mean age of patients in relation with nonbiliary and biliary complications and converted LC



Out of 220 cases in the current study, 40 (18.2%) patients had nonbiliary complications and 5 (2.27%) patients had biliary complications respectively clearly showing nonbiliary complications occur much more frequently than biliary complications. Out of these 40 patients, 12 were male and 28 were females with an incidence rate of 20.33% and 17.39% who encountered these and had no significance with gender with p-value of 0.616. The patients with high BMI have high incidence of nonbiliary complications during LC which was also consistent with an increased chance of conversion to an open procedure as shown in table 1.

Table 1: Association of Incidence of Nonbiliary complications, biliary complications and Chances of Conversion to Open Procedure with BMI of the Patients

In relation with Nonbiliary complications during LC		
Mean BMI for patients having nonbiliary complications	Mean BMI for patients undergoing uneventful LC	p-value
28.62	27.32	0.033
In relation with conversion to open procedure		
Patients converted to open procedure	Patients not converted to open procedure	p-value
29.72	27.24	<0.001

In the study sample, 57 had history of previous abdominal surgery of which 20 (35.08%) encountered Nonbiliary complications and had a significant association ($P < 0.01$). Similarly, 49 patients had tenderness in right hypochondrium of which 28 (57.14%) encountered Nonbiliary complications which was also significant ($P < 0.01$) and high chances of conversion as shown in table 2.

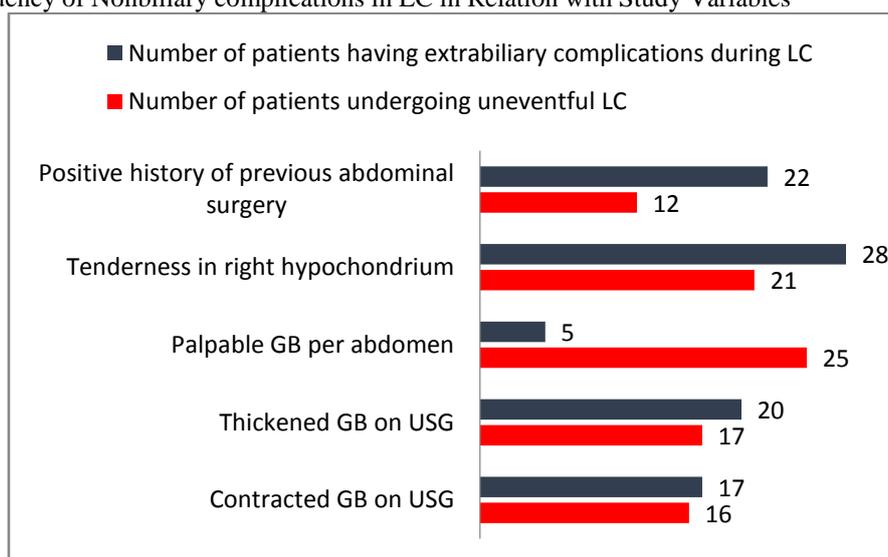
Table 2: Association of Incidence of Nonbiliary complications, biliary complications and Chances of Conversion to Open Procedure with History of Tenderness in Right Hypochondrium

In relation with Nonbiliary complications during LC				
Patients having Nonbiliary complications during LC		Patients undergoing uneventful LC		p-value
Tenderness in right hypochondrium present	Tenderness in right hypochondrium absent	Tenderness in right hypochondrium present	Tenderness in right hypochondrium absent	<0.001*

28	12	21	159	
In relation with conversion to open procedure				
Patients converted to open procedure		Patients not converted to open procedure		p-value
Tenderness in right hypochondrium present	Tenderness in right hypochondrium absent	Tenderness in right hypochondrium present	Tenderness in right hypochondrium absent	0.021
11	17	38	154	

Also 30 patients had Palpable Gallbladder while 190 patients had no such finding. Out of these 30 patients, 5 (16.67%) encountered Nonbiliary complications which had no significance (p- 0.817). On USG abdomen of these patients, 37 patients had thickened GB wall on USG. Out of these 37 patients, 20 (54.05%) encountered Nonbiliary complications which was significant p vale<0.01 and similarly 33 patients had contracted GB wall on USG. Out of these 33 patients, 17 (51.51%) encountered Nonbiliary complications which was also significant p value<0.01. as shown in graph 2.

Graph 2:Frequency of Nonbiliary complications in LC in Relation with Study Variables



Out of the 220 patients included in this study, 46 patients had dense adhesions at calot's triangle found intra-operatively while 174 patients had no such finding. Out of these 46 patients, 15 (32.61%) encountered Nonbiliary complications. On analyzing these observations with chi-square test, the p-value obtained was 0.004 suggesting significant association adhesions at calot's triangle and Nonbiliary complications during LC.

III. Discussion

Laparoscopic cholecystectomy remains the gold standard procedure for cholecystectomy. The etiology underlying variable outcomes from laparoscopic cholecystectomy is complex in origin, relating to disease severity, surgical experience, and available instrumentation. It is accepted that recovery is delayed, and risk of complications compounded by both delayed emergency cholecystectomy and excessive conversion from laparoscopic to open surgery. Laparoscopic approach can be technically difficult in some patients with a certain set of complications which include biliary and nonbiliary ones of which nonbiliary complications are under reported which if identified pre-operatively or early during the surgery can certainly reduce the incidence of these avoidable complication.

As it was found, no statistically significant association was present between incidence of nonbiliary complications and age of the patients.no significant association was present on this study between incidence of nonbiliary complications during LC and gender of the patients which is consistent with the findings of George Bazoua et al. who also found Male gender has no impact on the outcomes of laparoscopic cholecystectomy. Gender affects the duration of surgery. Similarly, Abdulmohsen A. Al-Mulhim et al. found that Male gender is not an independent risk factor for satisfactory outcome of LC in the experience of a single surgeon. Obesity and high BMI has multi-fold effect on the difficulty encountered during LC. Firstly, obesity results in difficulty during laparoscopic port access for surgeon due to thick abdominal wall. Secondly, higher chances of cardio-respiratory compromise are present in obese individuals. Lastly, higher insufflation pressures are needed in the obese for provision of working space during procedure, resulting in increased chances of gas embolism and in multivariate

analysis also, obesity or any of the comorbidities did not associate with an elevated risk for postoperative complications. In symptomatic gallstone disease, obesity and related comorbidities increased the conversion rate, but not the operative risks of LC. Paajanen H et al. concluded in their study the rate of complications, except surgical site infections, was comparable with non-obese patients. There was also a highly significant association between tenderness in right hypochondrium and Nonbiliary complications occurring during LC which were very much similar to findings of Kitano S et al. who observed application of laparoscopic cholecystectomy (Lap. C) in patients with acute cholecystitis (AC) and tenderness in right hypochondrium remains controversial from the viewpoint of its higher rate of morbidity, and conversion to open surgery,

Procedure-related complications are more likely to occur when there is history of repeated attacks of acute cholecystitis leading to distortion of anatomy of Calot's triangle. Thickened GB wall was associated with significantly increased complications (other than bile duct stricture) developing after surgical or laparoscopic re-operation and great difficulty. This thickness was caused either by inflammation of the gallbladder wall or by the adherence of the greater omentum to the gallbladder as also seen by S Duca et al. similarly, chronically inflamed contracted gallbladder with a thickened wall during LC was associated with an increased conversion rate and difficult LC due to increased adhesions at Calot's triangle and was consistent with the findings of Wagih Ghnnam et al. These non-biliary complications can be life-threatening adding greatly to morbidity and mortality of patients undergoing laparoscopic cholecystectomy and an early diagnosis is critical to their management.

IV. Conclusion

Non-biliary complications occur much more frequent than biliary complications and were a significant cause of morbidity in patients undergoing laparoscopic cholecystectomy. The need for conversion of laparoscopic cholecystectomy to open approach keeping in mind these pre-operative and intra-operative factors should not be taken as a failure or a complication, but perceived as an attempt to avoid the undue complications.

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