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Press Press	The impact of gallbladder wall thickness in laparoscopic cholecystectomy- A retrospective study
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ABSTRACT	duction : Gallbladder wall thickening is an indicator of cholecystitis in patients presenting with symptoms of one disease.

**Objectives**: The aim of the study was to evaluate the impact of gallbladder wall thickness on the outcome of cholecystectomy, rate of conversion to an open procedure, to evaluate any intra or postoperative complications related to it and length of stay.

**Methodology**: This retrospective clinical trial conducted in patients undergoing cholecystectomy by laparoscopic method in a single surgical unit. Out of 73 patients with cholelithiasis on sonography, we encountered group A normal gallbladder wall thickness(3mm) in 36 patients, group B mild to moderately thickened gallbladder(4-6mm) in 24 patients and group C severely thickened gallbladder(7mm or more) in 13 patients.

**Results**: A greater degree of gallbladder thickness as in Group B and Group C is associated with difficulties encountered intraoperatively during cholecystectomy as well as increased postoperative complications as compared to Group A. The duration of operation(>1.5 hrs in 16.6%, 66.67%, 100% in Grp A, B & C respectively), the number of operations converted from laparoscopic to open(2.7%. 12.5%, 46.15% in Grp A, B & C respectively), the presence of adhesions(38.8%, 83.3% & 100% in Grp A, B & C respectively) and the placement of drains(50%, 83.3%, 100% in Grp A, B & C respectively) was more in patients of Group B and C as compared to that of Group A.

**Conclusion**: A greater degree of gallbladder wall thickness is associated with an increased risk of conversion, increased postoperative complications, and longer lengths of stay. Classifying patients according to degree of gallbladder wall thickness gives more accurate assessment of the risk of surgery, as well as potential outcomes.

## KEYWORDS : Cholecystectomy, Laparoscopic to Open, Gall stones, Gallbladder wall thickness.

## **1. INTRODUCTION**

Gallbladder wall thickening is an indicator of cholecystitis in patients presenting with symptoms of gallstone disease.

The aim of the study was to evaluate the impact of gallbladder wall thickness, on the outcome of cholecystectomy,rate of conversion to an open procedure, to evaluate any intra or postoperative complications related to it and length of stay. The normal gallbladder wall should measure less than 3mm<sup>(1)</sup>. While a thickened gallbladder wall is one sign of cholecystitis (acute cholecystitis, cholecystitis, ace-nomyomatosis cholecystitis), there are number of other normal and pathologic states which can lead to this finding as well: e.g., normal contracted gallbladder, gallbladder carcinoma, hypoalbuminemia, alcoholic liver disease, increased portal venous pressure, acute viral hepatitis, heart failure, renal disease, ascites etc. A normal gallbladder can exhibit a thickened wall of 4-5mm due to contraction alone. Typically this will occur in the setting of a lower-than-normal gallbladder volume.

Hypoalbuminemia is a major culprit in gallbladder thickening alone or as a secondary mechanism in patients with cirrhosis, heart failure or renal disease<sup>[2]</sup>. Gallbladder wall thickening is often evident in adenomyomatosis, cholecystitis and gallbladder cancer as well. In these settings the gallbladder wall diameter is directly a part of the pathology, and not a side effect of some other process. It is one of the major factors in determining the type of surgical procedure that may need to be performed while dealing with gall stone disease.

## 2. METHODOLOGY

All attempted laparoscopic cholecystectomies in our single surgical unit between july 2013 and december 2014 were retrospectively reviewed. Patients undergoing cholecystectomy for reasons other than gallstones (e.g., polyps or cancer) were excluded.

Patients were divided into three groups based on the degree of gallbladder wall thickness: group A normal (3 mm), Group B mild to moderately thickened (4-6 mm) and Group C severely thickened (7 mm and above). Outcomes were compared amongst the groups.

## Parameters observed in each patient were-

Detailed history of the patient with special emphasis on symptoms of biliary colic, history of previous attacks of colic, jaundice, history suggestive of pancreatitis etc.

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- History of comorbid conditions including DM, HT, significant illnesses and previous symptoms.
- Routine Investigations, including CBC, BT, CT, PT,S.billirubin,SGPT,S.alkaline phosphatase, HIV, HBsAg, Blood Urea, S. creatinine, Blood Sugar etc.
- Findings of specific investigations like Ultrasonography (USG) of abdomen.
- Intra operative finding including gall bladder wall thickness, number of stones, empyema gall bladder, adhesions, Calot's triangle anatomy, cut section appearance, level of difficulty, duration of surgery, etc. The duration of each procedure was noted starting just before insertion of the four ports till closure of all ports
- Post operative morbidity / Mortality.

#### 3. OBSERVATIONS AND RESULTS:

Thickness	NO. of pt.	Duration of operation			Cholecystectomy	
of gallbladder wall		<1 hr 30 min	1 hr 30 min-2 hr	>2 hr	lap	Lap converted to open
(A)≤3mm	36	30	4	2	35	1
(B)4- 6 mm	24	8	11	5	21	3
(C)≥7 mm	13	0	5	8	7	6

#### 73 patients were included in the study.

There were 10 cholecystectomy which we had converted from laparoscopic to open method.the incidence of conversion from laparoscopic to open method was 2.77%,12.5% and 46.15% in A, B and C group respectively.

Thickness of gallbladder wall	NO. of pt.	Presence of drain	Presence of adhesions	Average length of stay in lap cholecystectomy
(A)≤3mm	36	18 (50%)	14(38.8%)	2 days
(B)4- 6 mm	24	20 (83.3%)	20 (83.3%)	3 days
(C)≥7 mm	13	13 (100%)	13 (100%)	4.5 days

The incidence of intraoperative adhesions was 38.88%, 83.33% and 100% in A, B and C group respectively.

The incidence to put drain was 50%,83.33% and 100% A,B and C group respectively.

The average length of stay was 2 days, 3 days and 4.5 days in A, B and C group respectively in whom we performed laparoscopic cholecystectomy.

### 4.DISCUSSION

The inflamed gall bladder wall becomes friable and the enlarged vessels are more likely to break. Inflammation may also lead to bleeding that compromises orientation and the visual exposure at surgery, forcing surgeons to change the operative access.

Thickening of the gall bladder wall to > 3 mm that is related to ongoing acute inflammation and inflammatory infiltration of the neck and Calot's triangle are other important causes of difficulty during cholecystectomy<sup>[3]</sup>. Gallbladder wall thickness was an important predictor of difficulties during cholecystectomy. We encountered such difficulties in 20 (41.67%) patients with gall bladder wall thickness greater than 3 millimeter. These findings were in agreement with study done by Ali Dawood (Dawood et al., 2011)<sup>[4]</sup>.

Jantsch<sup>[5]</sup> (1987) reported that a thickened gall bladder wall of more than 4 mm frequently indicates acute cholecystitis. In 84% of the patients with a gall bladder wall thickening (> 4 mm) surgeons encountered surgical difficulties. In our study, a gall bladder wall thickness of more than 3 mm was significantly associated with difficult surgical preparations and operation.

Difficulty during cholecystectomy has been associated with a longer operative time, the use of more anesthetics, increased overall morbidity, a higher rate of infective complications, longer recovery time, longer hospital stay, higher cost, and greater patient dissatisfaction<sup>[6]</sup>.

Our study shows that gall bladder wall thickening can predict difficulty during cholecystectomy, we found that thickened gall bladder wall are the most accurate predictors of potential operative difficulty, confirming the experience of European surgeons who reported that a thickened gall bladder wall was associated with a technically difficult operation and prolonged operation time. The findings of this study are in agreement with those reported by Corr (Corr et al., 1994)<sup>[7]</sup>, who found a significant association between a thickened gall bladder wall and operative difficulty.

A study by Fuchs (Fuchs et al., 1942)<sup>[8]</sup> found that laparascopy may even be advantageous for patients who are difficult to operate on. Although conversion to laparotomy alone does not worsen patients' outcome, several reasons support the preoperative assessment of the feasibility of laparoscopy. It is important to have some idea about the individual patient's risk when obtaining informed consent. Also cost efficiency aspects should be considered because the equipment for an unsuccessful laparoscopy is expensive.

In our study, we found that the rate of conversion from laparoscopic to open surgery was more with gall bladders having increased wall thickness and so was the difficulty during the operation. Identifying potential difficulties is especially important in a teaching hospital where an open cholecystectomy has become a rare procedure (Schauer, 1994)<sup>[9]</sup> and requires an experienced surgeon.

#### 4. CONCLUSION

A greater degree of gallbladder wall thickness is associated with an increased risk of conversion, increased postoperative complications, and longer lengths of stay. Classifying patients according to degree of gallbladder wall thickness gives more accurate assessment of the risk of surgery, as well as potential outcomes.

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