ORIGINAL RESEARCH PAPER

General Surgery

PRE-OPERATIVE CLINIC O-RADIOLOGICAL ASSESSMENT OF DIFFICULTY IN LAPAROSCOPIC CHOLECYSTECTOMY

KEY WORDS:

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INTRODUCTION

Gallstone disease is one of the most common problems affecting the digestive tract. The prevalence of gallstones is related to factors like age, gender, and ethnic background. The prevalence of gallstone varies widely from place to place. It is estimated that approximately 20 million people in the United States have gallstones and that approximately 1 million new cases of cholelithiasis develop each year. In India the prevalence is estimated to be around 4%[1], changing incidence in India is mainly attributed to westernization of diet, change in socioeconomic structure and availability of ultrasound as investigation in both rural and urban areas.

Laparoscopic cholecystectomy (LC) is widely accepted as gold standard for treatment of symptomatic cholelithiasis[2]. Though considered the gold standard technique, it is also sometimes technically challenging for the surgeons in view of difficult intra-operative anatomy, difficulty in dissecting around the calot's triangle or dense adhesions between the gall bladder and the adjoining structures.

AIMS & OBJECTIVES

Pre–operative assessment of difficulty in laparoscopic cholecystectomy by analyzing clinical and radiological parameters.

MATERIALS AND METHODS

This is a prospective, analytical, single centre study done in Department of General Surgery, NRI medical college and General Hospital. The data collection was done in the period spanning from September 2016 to September 2018. Total 99 cases were included in the study admitted in Department of General surgery for symptomatic cholelithiasis during study period.

INCLUSION CRITERIA:

All the patients undergoing laparoscopic cholecystectomy for symptomatic cholelithiasis

EXCLUSION CRITERIA:

- Patients with acalculous cholecystitis, CBD stones, CA gallbladder.
- Patients with comorbid conditions precluding an elective surgery.
- Patients undergoing cholecystectomy for non gallstone related diseases.
- Cholecystectomy for asymptomatic patients.

METHODOLOGY:

All patients undergoing laparoscopic cholecystectomy were included in this study type regardless of the age. Patients meeting the exclusion criteria were not included in the study. Clinical and radiological parameters were analyzed for significant correlation with the outcome of the surgery (dependent variables) to assess difficulty in laparoscopic cholecystectomy.

Details of cases were recorded including history, clinical examination and investigations done. Four parameters number of attacks, total leucocyte count, gall bladder wall thickness and pericholecystic fluid collection on ultrasonography of each patient were recorded preoperatively and compared with intaoperative findings. Intraoperative findings were divided into easy laparoscopic cholecystectomy, difficult laparoscopic cholecystectomy and conversion to open cholecystectomy. Difficult laparoscopic cholecystectomy was judged based on presence of at least one of the following i.e. dense adhesions between gallbladder and surrounding, dense adhesions between gallbladder and liver bed and frozen Calot's triangle, duration of surgery more than 1 hour and conversion to open.

RESULTS

A total of 99 patients were included in the study. the mean age of the patients was 47.7 years within the range of 20-27 years. of the total 99 patients recruited in this study majority of the patients were females (73.7%) and the percentage of males were 26.3%.

Table 1: Demographic data - Age distribution of the patients against the gender

Age group (years)	Total	
	Males	**Females**
18 – 30	0	8
31 – 40	1	17
41 -50	9	22
51 – 60	11	20
61 – 70	5	5
71 and over	0	1

Majority of patients both males and females fell under 30-50 years of age distribution accounting to about 50%[31-40(18%) and 41-50(32%)] of the total patients.

Patients were divided in to two categories as <50 years(n 50) and > 50 years (n 49) to assess the demographic data and intra operative outcome of the patients. As the mean age of the patients is 47.7 years. 50 years was taken as cut off and divided into two categories.

Table 2: Percentage of patients with co-morbidities and clinical history

Co-morbidities / Clinical history		Percentages of patients (%)
Diabetes		38.3
Hypertension		33.3
Previous abdominal surgeries		38.3
Right hypochondriac tenderness		88.9
Previous attacks		48.5
Dyspepsia		38.3
Vomiting		30.3
Pain duration	<1week	39.3
	>1week	34.3
	>1 month	26.2
Murphy's sign		23.2
Fever		21.2

Patients included in the study have the co morbid conditions like diabetes, hypertension, those who have undergone previous abdominal surgeries, those who have showed the signs of right hypochondriac tenderness, had previous attacks, dyspepsia, vomiting and pain abdomen

Table 3 Results from the radiological examination of the patients.

Test	Patient count	Percentage of patients
Gall bladder thickness Less than 3 mm More than 3 mm	56 43	56.6 43.4
Gall stones Single Multiple	26 73	26.3 73.7
CBD diameter Less than 8 mm Greater than 8 mm	86 13	86.9 13.1
Pericholecystic fluid Absent Present	68 31	68.7 31.3

In terms of the findings from radiological examination, there was not much difference in the gall bladder thickness. Almost half of the patients exhibited either thickness less than 3 mm or more than 3 mm. Also, CBD diameter was normal for most of the patients (86%). However, majority of the patients (73%) presented with multiple gall stones in contrast to only 26% of patients had single gall stone. Pericholecystic fluid was found in 31% of patients.

Table 4: Description of intraoperative findings among the patients, difficulty in the procedure and the conversion.

Parameter	Percentage of patients
Adhesion Dense No/ flimsy	54.5 45.5
Calot's dissection Easy Difficult	62.6 37.4
Gall bladder dissection Easy Difficult	84.8 15.2
Gall bladder thickness Normal Present	63.6 36.4
Stone/bile spill No Yes	66.7 33.3
Surgery duration Less than "1h" More than "1h"	29.3 70.7
Conversion No Yes	95.9 4.1
Difficulty in the procedure No Yes	70.7 29.3

Intra-operatively, almost half (54.5%) of the patients had dense adhesions and the rest (45.5%) showed no/ flimsy adhesions. About 62% had easy calot's triangle dissection and 37% had difficulty. Majority (84%) of the patients had easy gall bladder bed dissection and only 15% of the patients had difficulty. Gall bladder thickness was absent in 63% of the patients and present in 36% of the patients at the time of surgery. Conversion decision to open had to be made in only 4% of the patients

Distribution of surgical outcome
Based on intra operative data scoring was done and divided in to two groups easy(score<5) group and difficult(score>5) group, out of which 29 (29.3%) of the cases were difficult and 70 (70.7%) of them were easy.

Table 5: Association of demographic data with intra-op outcome

		Intra operative out come		Total	P value
		Easy	Difficult		
Age	<50	39	11	50	0.107
	>50	31	18	49	
Gender	Male	17	9	26	0.487
	Females	53	20	73	
BMI	<25	26	5	31	0.862
	25-30	31	14	45	
	>30	13	10	23	
Diabetes	YES	20	18	38	0.0018
	NO	50	11	61	
HTN	YES	21	12	33	0.274
	NO	49	17	66	
H/O SURGERIES	YES	9	15	24	0.000
	NO	61	14	75	

As per table no: 5 out of 29 patients who had difficult LC 11(37.9%) are in age group <50 years and 18(62.1%) are in >50 years age group. Out of 26 male patients 9(34.6%) had difficult LC and out of 73 female patients 20(27.4%) had difficult LC. Out of 29 patients with difficult LC , 5 (17.2%) patients are in normal BMI (<25kg/m2),14(48.2%) are in overweight group(25-30kg/m2) and 10(34.4%) in obese group(>30kg/m2). Out of 24 patients with H/O of previous abdominal surgeries , 15 (62.5%) patients had difficult LC.

DISCUSSION
Laparoscopic cholecystectomy has now become the gold standard for the treatment of symptomatic gallstones. laparoscopy can be difficult in distorted anatomy due to dense adhesions in the calot's triangle , empyema of gallbladder, contraccted gallbladder, mirrzi's syndrome, previous upper abdominal operations and acute cholecystitis. the conversion rate of various studies ranges from 1.5% to 35%.[3-6]

In preoperatively predicted to be conversion, early decision of conversion can be made so as to avoid unnecessarily prolonging the surgery and to prevent complications. Many studies have attempted form a scoring system to predict difficult LC, but most of them are complex, use large number of determining factors, and they are difficult to use in day today practice[7-10].

In the present study total of 99 patients were included who were known cases of cholelithiasis admitted for surgery. Intra operatively the outcomes were noted and scored . Minimum score <5 was considered easy and >5 considered difficult. For analysis two categories were made EASY group (score<5) and DIFFICULT group(score>5) and were compared with the demographic data, clinical and radiological parameters and their association in the study

The overall conversion rate in our study was 4%. Conversion rate of 1.3 % was reported by Randhawa et al[11] only 3 cases out of 228 patients which was exceptionally low. The conversion rate in the present study is only 4.1% . The worldwide accepted conversion rate is around 2 -15%[12,13,14,15] , which is comparable to present study. In most of the studies age was considered as a risk factor for conversion[16-22] We and some other authors did not notice age to be associated with conversion rate[23,24]

Male sex as an independent risk for conversion is controversial. Few series have shown it to be an independent risk factor[19,20,23] .However, Liu et al., did not notice sex to be associated with conversion[18] . In our study, male sex was found to be a risk factor for conversion

Table no: 3 Shows the radiological parameters of the study. There is almost equal distribution of patients who exhibited gallbladder wall thickness more than or less than 3 mm. 56.6%(n 56) of patients had <3mm and 43.4%(n43) of patients had > 3mm. Syed Amzad Ali rizvi et al[12] had 32.8% and NAchnani et al[25] had 30.5% of patients with >3mm thickness. CBD diameter >8mm as taken as upper limit of cutoff for CBD dilatation. 86.9% (n86) patients had diameter <8mm and 13.1% (n13) had diameter >8mm. Lakatos et al had 25.7% of patients with diameter >8mm comparable to the present study. Lal et al[26] had only 4.1% of patients with dilated CBD, he took 6mm as upper limit of dilatation . Multiple gallstones were seen in 73.7% (n73) of patients and single stone was seen in 26.3%(n26) of them.This is comparable to the study done by NAchnani et al [25] showed 57.5% and 63.8% respectively. Pericholecystic fluid was seen in 31.3% (n31) and absent in 68.7%(n68) of the patients.

Gall bladder wall thickness has been identified as a risk factor for conversion in almost all the studies.The thickness of gall bladder associated with conversion varies from study to study. It was 3mm[19], 4mm[16] . In our study the critical gall bladder wall thickness was 3mm. Higher number of patients had difficulty in surgery (no= 25) are more than expected (ne=13.2) when the gall bladder thickness greater >3 mm.

 The presence of single/multiple gall stones doesn't determine the difficulty in the surgery. Multiple stones can cause difficulty in grasping the gallbladder or in extracting the specimen requiring extension of the port site incision. Gabriel et al [27] reported that in patients with multiple calculi, spillage of calculi in the peritoneum due to perforation of gallbladder was a leading factor for conversion.

Pericholecystic edema or fluid collection indicates ongoing inflammation of the gallbladder. There will be difficulty in holding the gallbladder wall due to the friability of the structures.There will be inflammatory ooze during dissection making visualization of structures difficult. Dhanke et al[28] found presence of pericholecystic fluid as a significant predictor of difficult cholecystectomy (p=0.001). Similarly, Syed amjad ali rizvi et al[12] found that sonographic presence of pericholecystic fluid should alert the surgeon of a possible conversion.

CONCLUSION

Cholelithiasis was mostly found in 30-50 age group(50%) .Although many studies reported male gender as a significant risk factor for difficult LC. The present study has concluded that there is no gender bias in difficult LC. We conclude that the difficult laparoscopic cholecystectomy and conversion to open surgery can be predicted preoperatively based on Gall bladder wall thickness and presence or absence of Pericholecystic collection.

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