

Research Article

Study of 292 patients for prediction of difficult laparoscopic cholecystectomy using detailed history, clinical and radiological parameters

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Received: 16 January 2016

Accepted: 29 January 2016

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ABSTRACT

Background: Now laparoscopic Cholecystectomy is one of most commonly performed procedure by General surgeon, and also of very much of interest for trainee to learn basic of laparoscopic procedure. On the basis of history, patient profile, clinical examination and radiological examination, we tried to select the cases that may help to predict the difficult GB.

Methods: This study was conducted in Department of General Surgery Mahatma Gandhi Medical College and Hospital, Jaipur from Aug 2013 to Aug 2015 and total 292 enrolled for this study. In our institute we defined DLC according to operating time which was >75 min from incision and veress needle insertion to GB extraction.

Results: In our study out of 292 pt we were found 72 pts as difficult GB. Detailed study of these patients clearly shows that pt. of male, higher side of age, increase duration of symptoms with multiple stone which are small in size have more chance of difficulty in laparoscopic Cholecystectomy because these patients have more repeated attacks of cholecystitis silently or clinically detected previously.

Conclusions: From this study we conclude that pre-operative radiological investigations (USG, MRCP) are no doubt good predictors of difficult laparoscopic Cholecystectomy in majority of cases and should be used as a screening procedure but more attention should be given to demographic data, history and clinical examination to predict the difficult LC.

Keywords: Difficult laparoscopic Cholecystectomy, History, Clinical examination, Duration of symptoms

INTRODUCTION

Laparoscopic cholecystectomy (LC) after its introduction by Mouret has replaced open Cholecystectomy as standard treatment.¹ Now laparoscopic cholecystectomy is one of most commonly performed procedure by General surgeon, and also of very much of interest for trainee to learn basic of laparoscopic procedure.²

As we all know advantages of laparoscopic procedure for Gall Bladder in comparison to open procedure, safe dissection is most important component of successful LC.

The difficult laparoscopic cholecystectomy (DLC) is a nightmare for surgeons but the definition of DLC is not well established and may vary from surgeon to surgeon.³⁻⁵

The various entities of DLC are difficult intra-abdominal access, difficulty to identify the anatomy, dense adhesions of structures, and many other complications found during LC. Approximately 2 – 15% of attempted LC has to be converted to DLC.⁶

On the basis of history, patient profile, clinical examination and radiological examination, we tried to select the cases that may help to predict the difficult GB. Such prediction may help to face all difficulties for performing surgeon and also making proper counselling and communication between operative surgeon and patient’s relatives.

METHODS

This study was conducted in Department of General Surgery Mahatma Gandhi Medical College and Hospital, Jaipur from Aug 2013 to Aug 2015 and total 292 enrolled for this study.

All patients with GB stone disease who were posted for laparoscopic Cholecystectomy included in this study. All routine investigations, haemogram, RFT, LFT, serum electrolytes, coagulation profile were carried out.

Patient with deranged LFTs, CBD stricture, other CBD pathology, H/O pancreatitis and patients with previous abdominal operations (Laparotomy scar) were excluded from study.

Detailed history (For timing between diagnosed GB disease and patient comes for surgery), demographic profile and USG whole abdomen and MRCP (Those who are suspicious of chloledocholithiasis) were taken into account for all the patients posted for LC.

The LC surgery was performed in our institute be experienced Lap surgeons; therefore learning curve statistics do not apply to this study.

In our institute we defined DLC according to operating time which was >75 min from incision and veress needle insertion to GB extraction.

The increased time may be due to:

Group I- Difficulty in getting intraabdominal access (due to obesity, previous adhesions of TB)

Group II- Difficulty in visualizing GB (Adhesions of omentum and transverse colon on Gall Bladder due to previous attaches of cholecystitis)

Group III- Difficulty in dissection at GB triangle (due to previous attack of cholecystitis or adhesion due to impacted neck stone, due to enlargement of left lobe of liver, dense peritoneum, distorted anatomy or bleeding).

Group IV – Difficulty in separating GB from liver bed mostly due to excessive bleeding from liver bed (may be due to cirrhotic liver of abnormal coagulation profile).

Group V – Intraoperative CVS/Respiratory problem so patient has to be converted to open.

RESULTS

In our study total 292 patients were enrolled for laparoscopic Cholecystectomy between August 2013 to August 2015. Out of 292 patients 194 were operated with no problem or easy GB (Table 1). 72 pts (24.65%) were found to have DLC as our study definition. 26 patients (8.9%) had to convert in open surgery during all tenure of study. Most of these conversions were due to inability to identify the anatomy so we did fundus first open Cholecystectomy or partial Cholecystectomy in these patients. Some of the conversions were due to incidental GB carcinoma finding. In our study we found little higher incidence of DLC was due to that we have a referral centre as a medical college, so we often receive patient who are found to have difficult surgery for periphery surgeons.

Table 1: Number of patients of difficult lap cholecystectomy.

Total no of patients	Total no of patient with or easy GB	DLC	Converted to open
292	194	72	26

Total 72 patients were operated under the definition of DLC out of 292 patients of total operative cases of laparoscopic Cholecystectomy in study tenure. There were 46 male and 26 female patients (Table 2).

Table 2: Demographic data of DLC patients.

	Mean Value	Range
Age	56.4	20 – 82 yrs
	Male	Female
Gender	46	26

All patients had symptoms of abdominal pain, acid peptic disorder or abdominal distension after food (Bloatness). Of 72 patients of DLC 49% patients have normal examination, tenderness 18% and 12% have lump right hypochondrium on physical examination (Table 3).

Table 4 shows that in our study 2 patients come in group I – those who had difficulty in intraabdominal access due to omentum adhesions to parietal peritoneum due to abdominal TB which was separated slowly and laparoscopic Cholecystectomy was performed.

Group II have 8 patients – were due to omentum was densely adherent to GB due to previous attacks of silent or clinically detected acute cholecystitis.

Group III have maximum patients – were due to previous attack of acute cholecystitis or other reasons.

Group IV – were due to liver bed oozing, coagulation profile deranged or cirrhotic liver.

Table 3: Symptoms and signs of difficult lap cholecystectomy.

Symptoms	% of patients
Abdominal pain	96 %
Acid peptic disorder (APD)	80%
H/O acute cholecystitis	26%
Physical examination	
Normal	49%
Tenderness	18%
Lump	12%

Table 4: Group of patients with difficult lap cholecystectomy.

Group	No. of Patients
I	2
II	8
III	60
IV	2

Table 5: Comparison of patients.

	Simple n=194	DLC n=72	Converted to open n=26
Age	42.9 +- 4.2	56.4 +- 2.1	55.2 +- 1.6
M/F	1 : 4 36/155	4 : 1 54/18	2 : 1 16/10
Duration of symptoms	Average 1.46 yrs (16.544 months.)	Average 3.14 yrs (37.228 months.)	Average 3.02 yrs (36.026 months.)
Number of stones-			
Single	124 pt. (63%)	21 pt. (29%)	8 pt. (31%)
Multiple	70 pt. (37%)	51 pt. (71%)	18 pt. (69%)
Size of stone :			
<1 cm	108 pt. (55%)	46 pt. (64%)	20 pt. (76%)
>1 cm	86 pt. (45%)	26 pt. (36%)	6 pt. (24%)
H/O of Acute cholecystitis	149 pt. (77%)	36 pt. (50%)	14 pt. (53%)

In our study Table 5 clearly shows that pt. of male, higher side of age, increase duration of symptoms with multiple stone which are small in size have more chance of difficulty in laparoscopic Cholecystectomy because these patients have more repeated attacks of cholecystitis silently or clinically detected previously.

Table 6: Comparison between biochemical markers.

	Simple LC n=194	DLC n=72	Converted to open n=26
SGOT	26.9+- 2.1	30.4+-1.6	36.4 +- 2.8
SGPT	28.4+- 1.6	40.4+1.2	42.4 +- 0.6
Alkaline Phosphatase	94 +- 1.2	180+-1.0	160 +- 1.2
Total Bilirubin	0.73+0.02	1.2+- 0.1	1.1 +- 0.6

Table 6 shows that however liver function tests of patients planned for Cholecystectomy were within normal range but patient converted to open or found difficult LC had liver function in higher side of normal range.

Table 7: USG finding comparison.

	Simple LC (192 pt.)	Difficult LC (72 pt)	Converted to open (26 pt.)
GB wall thickness <4cm/>4cm	180/12 pt.	16/56 pt.	6/20 pt.
Impacted stone at neck	6/186 pt.	30/42 pt.	16/10 pt.
Contracted GB	14/178 pt.	32/40 pt.	12/14 pt.

Table 7 shows that USG finding of GB thickness, impaction of GB at neck, and contracted GB clearly indicate about difficulty in laparoscopic Cholecystectomy.

DISCUSSION

Laparoscopic Cholecystectomy is one of most commonly performed procedure by general surgeons and is undergoing regular improvement with technology in order to make surgery safe.

Lot of studies have been published in literature on prediction of difficult laparoscopic Cholecystectomy bur there is little data on extent of difficulty of LC by history, demographic data and clinical examination when USG finding had their limitations.

The aim of our study was to evaluate some preoperative factors basically by history, clinical examination and

demographic data which can reliably predict the chances of DLC or conversion to open Cholecystectomy.

Also it may benefit patient and doctor because they can inform of the possibility of complications and conversion to open procedure.

As there is no clear and agreed definition of DLC we define DLC as longer operative time than normal in our study and classify patients in four groups I, II, III and IV according to difficulty in doing laparoscopic Cholecystectomy.

Most common type of DLC was grouping III in which difficulty in dissection at calot's triangle due to adhesions, bleeding or inability to identify the anatomy. Conversion rate were also high in this group.

In our study 2nd most common group was Group II when omentum was densely adherent to GB due to previous attacks.

Other group I and IV where adhesions were due to other causes and liver bed bleeding was there.

The operative time was longest in group III and group II difficulty. The same result of conversion and difficulty in laparoscopic Cholecystectomy were found in Lal P et al.⁷

In our study, we found a good correlation between radiological finding of increased GB wall thickness, impacted neck stone and contracted GB in predicting difficulty in GB and conversion to open Cholecystectomy. The same results were obtained in other studies.⁸⁻¹³

In our study we emphasize on history as there is linear correlation between duration of symptoms, silent or clinical attacks of cholecystitis and difficulty level of LC as each attack of cholecystitis increased the adhesion between GB and omentum, increased adhesion of calot's triangle and GB to its fossa.

In our study we found strong correlation between previous history of mild dull aching pain in Rt. Hypochondrium from long time and difficulty in LC. Our result correlates with DW Ratter et al.¹⁴

In our study advance age found to be an important risk factor for predicting DLC as shown that advance age is a risk factor for difficulty in GB surgery in Simopoulos C et al.¹⁵ This study shows that increase age is associated with risk factor for LC because then patient had history of long duration of symptoms and increase no of attacks of cholecystitis.

In our study male, the presence of male sex was associated with difficulty in LC. According to Russell JC et al, have suggested that men tend to present late as the pay less attention to subtle symptoms.¹⁶

In our study multiple stones which are small in size had increased chances of facing difficulty in LC which was similar to findings of Sharma A et al.¹⁷

In our study we found that patients planned for LC had normal LFT but patients found to be difficult or converted to open had high side of LFT but within normal range. Alponat A et al and Kama NA et al have demonstrated a similar association in their study.^{18,19}

CONCLUSION

From this study we conclude that pre-operative radiological investigations (USG, MRCP) are no doubt good predictors of difficult laparoscopic Cholecystectomy in majority of cases and should be used as a screening procedure but more attention should be given to demographic data, history and clinical examination to predict the difficult LC because:

1. Elderly patients are more prone to have a difficult LC.
2. Male tend to have higher no. of difficult cases.
3. Longer duration of symptoms have high chance of difficult LC due to recurrent cholecystitis.
4. Multiple and small size of stone have high risk of recurrent cholecystitis.
5. Higher side LFT have high risk of difficult LC.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the institutional ethics committee

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Cite this article as: Agarwal D, Arora D, Avasthi A, Kothari A, Dangayach KK. Study of 292 patients for prediction of difficult laparoscopic cholecystectomy using detailed history, clinical and radiological parameters. *Int Surg J* 2016;3:349-53.