

Original Research Article

Prediction of difficult cholecystectomy, a study of 100 cases

Debananda Tudu^{1*}, Bana Bihari Mishra²

¹Department of General Surgery, VSS Institute of Medical Sciences and Research, Sambalpur university, Burla, Odisha, India.

²Department of General Surgery, SCB Medical College, Utkal university, Cuttack, Odisha, Bhubaneswar, India.

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*Correspondence:

Dr. Debananda Tudu,

E-mail: dntudu7@gmail.com

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ABSTRACT

Background: Cholelithiasis is a common problem in day to day surgical practice, which has a prevalence of 10-15%. The prevalence is more here in this part of the country as this is a pocket of sickle cell disease region. Laparoscopic cholecystectomy is the gold standard procedure for gall stone diseases. Out of many complications one of the most important complications of laparoscopic cholecystectomy is bile duct injury particularly in difficult cases. Difficulties arise during creation of pneumoperitoneum, releasing adhesion, identifying anatomy, anatomical variations and during extraction of gall bladder.

Methods: A prospective study was carried out at VSS institute of Medical Science and Research, Burla, Sambalpur, a tertiary referral centre and a teaching hospital in the western Odisha. One hundred patients with symptomatic cholelithiasis were taken up for the study after due clearance from the institutional ethical committee. They were evaluated for risk factors such as age of the patient, sex of the patient, previous abdominal surgery, number of previous attacks, total WBC count, gall bladder wall thickness and pericholecystic collection on ultrasonography.

Results: Previous abdominal surgery, duration since acute attack, number of previous attacks, ultrasonography findings of increased wall thickness, stone impaction at neck and pericholecystic collection, increased total WBC count are associated with difficult laparoscopic cholecystectomy.

Conclusions: The predictors for difficult cholecystectomy will make the surgeon extra cautious during the procedure so as to minimize the complications.

Keywords: Difficult cholecystectomy, Gall bladder, Total WBC count

INTRODUCTION

Laparoscopic cholecystectomy is gold standard procedure for the patients with symptomatic cholelithiasis. Advantage of laparoscopic cholecystectomy being less post-operative pain, shorter hospital stay, early recovery, early return to work and better cosmesis. With advanced imaging the morbid obesity and previous abdominal surgery which was considered to be contraindicated is no more contraindicated. However, the dreaded complication of laparoscopic cholecystectomy is bile duct injury. Of all laparoscopic cholecystectomy procedures 1-13% requires conversion to open cholecystectomy for

various reasons.¹ It is important in the part of the operating surgeon to predict risk of conversion to open cholecystectomy so as to inform the patient as well as the attendants and the operating team to be ready for open cholecystectomy if needed. The present study is conducted to predict difficult laparoscopic cholecystectomy basing on clinical, haematological and radiological parameters.

METHODS

This work had been undertaken in VSS Institute of Medical Science & Research, Burla from December,

2016 to November, 2017. One hundred cases with Symptomatic Cholelithiasis were included in this study. Institutional ethical committee approval was taken for the study. Patients with bleeding diathesis, carcinoma gall bladder, and history of jaundice, dilated common bile duct with or without stone, emphysema gall bladder, acalculous cholecystitis and patients unfit for general anesthesia were excluded from the study. On admission they were subjected for thorough clinical history and examination. They had undergone biochemical and radiological evaluation.

History of jaundice, pancreatitis, diabetes, alcoholism with evidence of cirrhosis were elicited. Previous abdominal scar, palpable lump are considered as bad prognosticators. Increased total WBC count, wall thickness more than 4mm, large impacted stone, multiple packed calculi, pericholecystic collection are considered as the case for difficult laparoscopic cholecystectomy. Patients with altered liver function test were undergone MRCP to exclude CBD stone or Mirrizi. Cases with palpable lump without associated symptoms were treated conservatively. Difficult Calot's cases were subjected to intra-operative cholangiogram, fundus first method or partial cholecystectomy as per need. Patients were divided as easy, difficult and conversion. Conversion was reserved for very difficult cases.

RESULTS

Age of our patients ranged from <20 to >70years. Out 100 of our patients 27 (27%) are in the age group of 40-50years, followed by 22 (22%) patients are in the age group of 31-40years of age. The youngest patient was of 15years of age and the oldest patient in our study was of 77years of age.

Table 1: Age distribution-total cases-100.

Age in years	No. of patients	Age in years
< 20	2	< 20
20 - 30	15	20 - 30
31 - 40	22	31 - 40
41 - 50	27	41 - 50
51 - 60	17	51 - 60
61 - 70	14	61 - 70
>70	3	>70

Table 2: Sex distribution.

Sex	No. of case
Male	41
Female	59

There were 59 (59%) female and 41 (41%) male patients. Females dominated over males in our series. Male: Female ratio was 1.4. Out of 22 difficult cholecystectomy 12 patients were male and 10 were female patients.

Difficult cholecystectomies were more noted in male patients.

Table 3: Number of previous attacks.

No. of attacks	Easy	Difficult	Conversion	Total
1	54	2	0	56
2	17	9	1	27
3 />3	5	11	1	17

Out of 100 patients 44 patients had more than one previous attack. Out of the 17 patients who had 3/>3 previous attacks 12 patients had difficult cholecystectomy and one had undergone conversion to open cholecystectomy.

Table 4: Total WBC Count.

TWB Count (Per cumm)	Easy	Difficult	Conversion	Total
4000 - 11000	70	9	0	79
>11000	6	13	2	21

Out of 100 patients 79 patients had TWBC count between 4000-11000/cmm in our study. Out of 100 cases 21 patients were having TWBC >11000/cmm. Most of the patients with raised TWBC count noted to have difficult laparoscopic cholecystectomy and 2 had conversion to open cholecystectomy.

Table 5: Gall bladder wall thickness.

GB wall thickness	Easy	Difficult	Conversion	Total
<4mm	67	8	0	75
>4mm	10	13	2	25

Gall bladder wall thickness was less than 4mm in 75 (75%) of cases in our study. It was observed that 25 patients with gall bladder wall thickness >4mm were difficult laparoscopic cholecystectomy and 2 patients were converted open cholecystectomy.

Table 6: Pericholecystic collection.

Pericholecystic collection	Easy	Difficult	Conversion	Total
Absent	73	10	0	83
Present	3	12	2	17

Out of the 100 cases in our study 17 patients had pericholecystic collection on ultrasonography of abdomen. Out of these patients all had difficult cholecystectomy and 2 patients were converted to open cholecystectomy. The conversion rate in our study was 2%. Out of 100 cases 22 cases were labeled as difficult gall bladder using the preoperative ultrasound grading and intra-operative grading system. MRCP following ultrasound was useful to identify Mirrizi, short and wide

cystic duct and other anomalies. Two cases were converted to open cholecystectomy due to contracted gall bladder with frozen Calot's. Seven cases underwent partial cholecystectomy. Rest 13 cases could be treated by laparoscopy using fundus first method.

DISCUSSION

Laparoscopic cholecystectomy is a commonly done surgical procedure at the present scenario and has almost replaced the conventional open cholecystectomy. Evident benefits of laparoscopic cholecystectomy such as reduction in postoperative disability, better cosmetic outcome and early return to work have rendered it the procedure of choice for symptomatic cholelithiasis. The present observational study was done to determine the different factors for predicting difficult laparoscopic cholecystectomy.

The common age group by Prasant S. Dhanke et al in a study 110 cases was 31-40 years of age.² Bingener-Casey et al study, depicted a mean age as 40 years.³ In a study conducted by Rabindra Nidoni et al in 180 cases found that majority of the patients were in the age group of 31-50 years of age.⁴ Age >50 years had been found to be a significant risk factor for difficult cholecystectomy by Lee NW et al.⁵ Kama et al, reviewed 1000 patients of cholelithiasis and found that 41.7% were >60 years of age and had conversion rate of 7% as compared to 3.9% in patients <60 years of age.⁶ The majority of our patients were in the age group of 31-50 years of age which corroborate with the study of Prasant S. Dhanke et al and Rabindra Nidoni et al.^{2,4} In our study it was observed that difficult cholecystectomy was noted in patients 50 years of age, which is similar to the study of Lee NW et al and Kama et al.^{5,6}

In a study conducted by Rabindra Nidoni et al in 180 cases found that Male: Female was 1:1.76.⁴ Nikhil Gupta et al, 2013 in 210 patients found 85.7% patients were females.⁷ Female predominance was noted in our study, Male:female ratio was 1:1.4. It corroborates with study of Rabindra Nidoni et al and Nikhil Gupta et al where they noted more number of female patients.^{4,7} Male sex makes laparoscopic cholecystectomy difficult as reported Nachani J et al in 2005 and Lein HH et al in 2002.^{8,9} In our study difficult laparoscopic cholecystectomy was more noted in male patients as well as the conversion to open cholecystectomy which correlates with the study of Nachani J et al, 2005 and Lein HH et al, 2002.^{8,9}

The more the number of previous attacks the more difficulty laparoscopic cholecystectomy was noted. Rabindra Nidoni et al, 2015 in 180 cases noted that more than 2 attacks of acute cholecystitis had more conversion rate.⁴ Sanabaria et al, 1994 in a study of 628 patients noted multiple attacks were associated with more conversion rates.¹⁰ In our study 17 patients had 3 or >3 attacks out of which 11 patients had difficult laparoscopic cholecystectomy and 1 patient was converted to open

cholecystectomy which corroborated with the study of Rabindra Nidoni et al.⁴



Figure 1: Dense adhesion around gall bladder and frozen Calot's triangle.

Many studies have noted that raised WBC count is associated with more conversion rate. In study conducted Tiwari KS et al, 2008 and Rabindra Nidoni et al in 180 cases found that conversion was more noted when the TWBC was >11,000/cmm.^{11,4} In our study 21 patients had raised WBC and out of the 13 had difficult cholecystectomy and 2 patients were converted to open cholecystectomy, which is similar to the study of Rabindra Nidoni et al.⁴ The conversion rate in our study was 2%.



Figure 2: Totally Frozen Calor's triangle making the dissection difficult

Gall bladder wall thickness >4mm is associated with more conversion rates. Few studies had proposed the thickened gall bladder to be >3mm of wall thickness. Bedirli A et al, 2009 showed gall bladder wall >3mm had required conversion to open cholecystectomy procedure.¹² Nachani J et al, 2005 in their study had similar finding that patients with increased wall thickness had difficult laparoscopic cholecystectomy.⁸

Jansen S et al, 1997 showed gall bladder wall thickness >4 mm had more conversion rate.¹³ Our study showed gall bladder wall thickness >4mm in 25 patients, out of which 13 patients had difficult laparoscopic cholecystectomy and 2 patients were converted to open cholecystectomy.



Figure 3: Post-op thick-walled fibrotic gall bladder laden with stones.

Pericholecystic fluid collection is a risk factor for predicting difficult cholecystectomy. Rabindra Nidoni et al, 2015 in a study of 180 patients found that patients with pericholecystic fluid collection had significant rates of difficulty (23.27%) and conversion (1.88%).⁴ Randhawa and Pujahari et al, 2009 noted that patients with pericholecystic fluid collection had difficult laparoscopic cholecystectomy and more conversion rate to open cholecystectomy.¹⁴ In our study 17 patients had pericholecystic fluid collection, out of which 12 patients had difficult laparoscopic cholecystectomy and 2 patients were converted to open cholecystectomy.

CONCLUSION

Pre-operative identification of a difficult gall bladder helps the surgeon for further investigation. Careful surgery with different modifications and keeping the patient informed about the chance of conversion. The difficult laparoscopic cholecystectomy can be predicted preoperatively by elderly male patients, previous abdominal surgeries, and number of previous attacks, total WBC count, gall bladder wall thickness and pericholecystic collections.

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