

Study of Difficult Laparoscopic Cholecystectomy and Its Outcome According to Peroperative Scoring System

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ABSTRACT

Aims: To study comparison of peroperative finding in difficult cholecystectomy with a scoring system, to evaluate the amount of complexity in the surgery and its outcome.

Materials and methods: A study of 50 patients undergoing elective difficult laparoscopic cholecystectomy was done. In difficult cholecystectomy, peroperative scoring was carried out, and based on these findings evaluation of the amount of complexity and results of the surgery was assessed according to the scoring system.

Results: Patients with chronic calculous cholecystitis were 16 and degree of difficulty had an average score of 5 while of acute calculous cholecystitis were 28 patients with an average score of 6 and mucocele of gall bladder were 3 cases with an average score of 7. Two cases of empyema gall bladder and one case of gangrenous gall bladder both with an average score of 8. All extreme difficulty cases with a score of 8 were converted to open. Increased severity of score is proportional to the increased complexity of the surgery. Conversion to open surgery is indicated in an extreme degree of difficulty with a score of 8.

Conclusion: This intraoperative scoring system is important in the evaluation of the complexity of cholecystectomy surgery and evaluating the amount of complexity in carrying out laparoscopic cholecystectomy.

Clinical significance: In mild, moderate, and severe degrees of difficult cholecystectomy according to the peroperative scoring system (5–7), can be completed laparoscopically without complication. In extreme level difficult cholecystectomy, peroperative scoring system (≥ 8) can guide us to make the decision to convert it into open surgery and also help in preventing life-threatening complications like bile duct injury.

Keywords: Cholecystitis, Degree of difficulty, Laparoscopic cholecystectomy, Severity grading.

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INTRODUCTION

Laparoscopic cholecystectomy is one of the commonly performed general surgical operations both in a planned and emergency situation. There is lots of evolution in the management of cholecystitis.¹ Laparoscopic cholecystectomy has done marked revolution since it was introduced.² Currently cholelithiasis is best managed by laparoscopic cholecystectomy (gold standard method).³ But difficulty in performing cholecystectomy depends on different peroperative findings. The scoring system is helpful in the conversion of laparoscopic cholecystectomy to open to make the procedure safer surgical practice. If peroperative finding score is high (≥ 8) then for prevention of complications like bile duct injury, or if prolonged time is taken for laparoscopic surgery, the scoring system helps in decision making of conversion into open surgery.⁴ Nowadays the significance of early surgery in acute cholecystitis has been recommended.⁵ There are few international guidelines that suggested a protocol of treatment. According to those guidelines, standardized definitions of cholecystitis have been made.^{6,7}

According to those guidelines, there are so many variabilities to approach in difficult cholecystectomy by peroperative finding in management of difficult cholecystectomy.⁸ Out of few scoring systems reported there is no operative definition of findings at laparoscopic surgery.^{9,10} That is why there are hurdles to carry out and compare results or to give a protocol for future study. This study was carried out to observe peroperative finding and evaluate the amount of complexity in difficult laparoscopic

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cholecystectomy by means of peroperative scoring system structured by Sugrue *et al.*³

METHODS AND MATERIALS

The study was carried out among 50 patients who underwent laparoscopic cholecystectomy admitted to our hospital, AMC MET Medical College, Ahmedabad. The study was carried out after taking permission from the local ethical committee. Patients were informed about the procedure and written consent was taken. Peroperative blood investigations and imaging was done in all the cases. Elective laparoscopic cholecystectomy was done in all the cases and a few of them had acute cholecystitis. We have excluded mild and moderate cases of severity index (score < 5) in laparoscopic cholecystectomy. To the best of our knowledge,

difficult cholecystectomy is defined as a score ≥ 5 that is included in our study.¹¹

Intraoperative findings were assessed on the basis of five key aspects which includes:¹¹

- Appearance of gallbladder and amount of adhesions;
- Distension/contraction of the gallbladder;
- Access to the peritoneal cavity;
- Any local/septic complications;
- Time taken to dissect the Calot's triangle.

All the patients were accessed by the intraoperative scoring system and evaluated for the amount of complexity and results of the surgery were studied by the above scoring system (Tables 1 and 2).¹¹

RESULT

This study was carried out on 50 cases of difficult laparoscopic cholecystectomy among them 45 patients were female (90%) and males were 5 (10%). Most females were 22–55 years of age. Males were between 48 and 70 years. All of them are evaluated according to scoring and categorized into difficult laparoscopic

Table 1: Scoring according to peroperative finding

<i>Cholecystitis scoring according to peroperative finding</i>	<i>Score</i>
Appearance	
Adhesions <50% of GB	1
Adhesions >50% but GB buried	2
Completely buried GB	3 (max)
Distension/contraction	
Distended GB or contracted shrilled GB	1
Inability to grasp without decompression	1
Stone >1 cm impacted in Hartmann's pouch	1
Access	
BMI >30	1
Adhesions from previous surgery limiting surgery	1
Sepsis and complications	
Free bile or pus outside the gallbladder	1
Fistula	1
Total possible	10

Table 2: Grading of difficulty

<i>Grading of degree of difficulty according to peroperative finding</i>	
Mild	<2
Moderate	2–4
Severe	5–7
Extreme	8–10

Table 3: Overview of whole study

<i>Degree of difficulty (according to peroperative scoring system)</i>	<i>Diagnosis</i>	<i>Mean severity score</i>	<i>Number of cases</i>	<i>Mean duration of surgery (in minutes)</i>	<i>Number of cases converted into open cholecystectomy</i>	<i>Peroperative complications</i>
Severe (score: 5–7)	Chronic calculous cholecystitis	5	16	45–60	0	0
	Acute calculous cholecystitis	6	28	55–70	0	0
	Mucocele of gall bladder	7	3	60–80	0	0
Extreme (score: 8–10)	Empyema of gall bladder	8	2	100–120	2	0
	Gangrenous gall bladder	8	1	125	1	0

cholecystectomy. Various operative findings were scored from 5 to 10 as per the operative predictors for difficult laparoscopic cholecystectomy (Table 3).

The Score of 5–7 (Severe Degree of Difficulty)

Out of 50 patients, 16 patients (34%) with chronic calculous cholecystitis were considered in the study and a severe degree of difficulty was encountered with a mean score of 5 during laparoscopic cholecystectomy. The duration of the surgery was between 45 and 60 minutes.

Total 28 (56%) cases of acute calculus cholecystitis were operated and a severe amount of complexity was faced with mean scoring of 6. About 60–70 minutes was the time taken to complete all laparoscopic cholecystectomies in the above patients.

In 3 (6%) cases of mucocele, the gallbladder was operated and a severe degree of difficulty was encountered with a mean score of 7 in these cases in performing laparoscopic cholecystectomy. About 54–81 minutes was the time taken to complete all laparoscopic cholecystectomies in the above patients. In one case cystic duct stump was transfixed with vicryl (3'0) by laparoscopic intracorporeal suturing.

The Score of 8–10 (Extreme Degree of Difficulty)

Two of the patients were found to have empyema of the gall bladder and an extreme degree of difficulty was found in those cases with a mean score of 8. These cases were converted to open cholecystectomy. The inability to dissect Calot's triangle with dense adhesion is the indication for conversion into open surgery. To prevent damage to the bile duct in one case subtotal cholecystectomy was done.

In one more case of gangrenous gall bladder with irresectable Calot's triangle and dense adhesions, we found an extreme amount of complexity with a score of 8 and was converted to open.

These three cases of extreme difficulty were required to be converted into open surgeries even after the usage of advanced energy devices (ligasure scalpel) to prevent bile duct injury.

Among all 50 cases, we have completed laparoscopic cholecystectomy successfully in 47 patients with a severe amount of complexity. While three cases with an extreme amount of complexity were converted to open surgery.

DISCUSSION

Due to unpredictable intraoperative findings, laparoscopic cholecystectomy is one of the most surprising operations in general surgery.¹² An unexpected amount of complexity of surgery was found in some cases while in some cases it is very easy.¹³ In about 6–35% of cases, laparoscopy cholecystectomy is converted to open.¹⁴ In this study, 6% of patients were also converted to open. Inability to dissect the Calot's triangle due to dense adhesions and

difficult anatomy in an extreme degree of complex cholecystectomy is the reason for conversion to open.^{15,16} Difficult cholecystectomy is judged by a few peroperative scoring systems with some amount of accuracy.¹⁷

Recently acute cholecystitis is operated by laparoscopic method within 48 hours with the increasing trend rather than interval cholecystectomy. So, to make the decision for conversion to open surgery intraoperative scoring system will provide indications.¹⁸ Scoring and evaluating intraoperative findings gives us a standardized protocol to judge the complexity of the disease. Above all, it guides us to convert the procedure to open and good outcome measurement with the score.

In this study chronic calculous cholecystitis has a mean score of 5 and acute calculous cholecystitis has a mean score of 6, so even though acute calculous cholecystitis has more degree of difficulty according to the scoring system we have managed them laparoscopically without any complications but the time taken to complete acute calculous cholecystitis was around 10 minutes more as compared to chronic calculous cholecystitis.

In this study, 47 (94%) patients have encountered a severe amount of complexity. Laparoscopic cholecystectomy was completed successfully when there was a score of ≤ 7 . It was converted to open surgery when the score was ≥ 8 . With a score of eight extreme amount of complexity was faced and our three patients of this score were converted to open surgery.

So, according to our findings higher the peroperative score, there might be higher chances of conversion to open surgery, and if the score is ≥ 8 the chances of successful completion of surgery by the laparoscopic method is very low.

None of our cases had any complications like bile duct injury. So, the scoring system has also guided us in the prevention of life-threatening peroperative complications.

CONCLUSION

This intraoperative scoring system according to peroperative finding is important in the evaluation of the mild, moderate, severe, and extreme amount of complexity in carrying out laparoscopic cholecystectomy. According to the scoring system, severe and extreme categories fall into difficult cholecystectomy. Most of the difficult cholecystectomy can be completed laparoscopically while only an extreme degree of peroperative finding has to be converted to open surgery thus the scoring system also provides indication for conversion.

However, this is a small and single-center study. Further, large multicentric study are required.

CLINICAL SIGNIFICANCE

In mild, moderate, and severe degrees of difficult cholecystectomy according to the peroperative scoring system surgery can be successfully completed laparoscopically without complication. On an extreme level difficult cholecystectomy, peroperative scoring system can help and provide guidance for conversion to open surgery and also help in preventing life-threatening complications like bile duct injury.

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