ORIGINAL RESEARCH

Analysis of Radiological and Clinical Data To Estimate Laparoscopic Cholecystectomy Difficulty: An Institutional Based Study

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Received: 02 April, 2023 Accepted: 09 May, 2023

ABSTRACT

Aim: The study aimed to utilize clinical, hematological, and ultrasonographic criteria to predict the difficulty of laparoscopic cholecystectomy and the potential need for conversion to open cholecystectomy (OC) prior to surgery. **Materials and Methods:** The study involved 60 cases of laparoscopic cholecystectomy and evaluated the duration of surgery, access to the peritoneal cavity, gallbladder bed dissection, difficult extraction, and the need for conversion to open cholecystectomy as dependent variables or outcomes. Data analysis was done using SSPS software. **Results:** The analysis of the surgeon's assessment in the study revealed that the majority of cases, 70%, were classified as easy, with 16.67% categorized as difficult, and 13.33% identified as very difficult. **Conclusion:** Preoperative evaluation has the potential to predict the likelihood of a challenging laparoscopic cholecystectomy (LC). This predictive information is valuable for both the patient and the treating surgeon in preparing for the surgery effectively.

Keywords: Cholecystectomy, Stones, Laparoscopic.

INTRODUCTION

Laparoscopic cholecystectomy, a minimally invasive surgical procedure used to remove a diseased gallbladder, has become the standard technique for routine cholecystectomies since the early 1990s.[1] This procedure is indicated for various conditions such as cholecystitis (acute/chronic), symptomatic cholelithiasis, biliary dyskinesia, acalculous cholecystitis, gallstone pancreatitis, and gallbladder masses/polyps—the same indications as open cholecystectomy. Cases of gallbladder cancer typically require open cholecystectomy for treatment.[2,3]

The utilization of laparoscopy for general surgical procedures, particularly laparoscopic cholecystectomy, has sparked significant interest within the medical community. Initial findings suggest that laparoscopic cholecystectomy may present several advantages over open cholecystectomy for treating symptomatic gallbladder disease.[4,5]Accurately identifying a patient's risk for conversion based on preoperative information can enhance preoperative counseling, streamline operating room scheduling, and improve efficiency. It also allows for better risk stratification, facilitates appropriate assignment of resident assistance, and helps minimize the time to conversion for improved patient safety. Additionally, it assists in identifying patients who may benefit from a planned open cholecystectomy.[6,7]

The study aimed to utilize radiological and clinical data to estimate laparoscopic cholecystectomy difficulty and the potential need for conversion to open cholecystectomy (OC) prior to surgery.

MATERIALS AND METHODS

The study involved 60 cases of laparoscopic cholecystectomy and evaluated the duration of surgery, access to the peritoneal cavity, gallbladder bed dissection, difficult extraction, and the need for conversion to open cholecystectomy as dependent variables or outcomes. The patients confirmed by USG examination were evaluated with the following factors: age, sex, h/o previous

hospitalization(cholangitis or obstructive jaundice, ERCP), BMI wt. (kg)/ ht. (mt^2), abdominal scar-supraumbilical or subumbilical, palpable gall bladder, sonographic findings- wall thickness, Pericholecystic collection, multiple/single large calculi.It utilized specific inclusion and exclusion criteria, focusing on patient characteristics, complaints, history, clinical examination, laboratory data, and abdominal ultrasound as risk factors for laparoscopic cholecystectomy.Data analysis was done using SSPS software.

Table 1: Distribution based on Pain.

Pain	No. of patients	Percentage(%)
LOCATION		
Rhc	46	76.67
EPI	14	23.33
CHARACTER		
Colicky	24	40
Dripping	13	21.67
Dull	13	21.67
RADIATING		
Back	12	20
No	41	68.33

Table 2: Clinical features.

Clinical feature	Number of patients	Percentage (%)
Vomiting		
Yes	38	63.33
No	22	36.67
Fever		
Present	19	31.67
Absent	41	68.33
Dyspepsia		
Present	28	46.67
Absent	32	53.33

Table 3: Per abdomen findings.

P/A palpation	Number of patients	Percentage (%)
Tenderness		
RHC	44	73.33
EPI	16	26.67
Mass		
Present	23	38.33
Absent	37	61.67
Murphy's		
Present	25	41.67
Absent	35	58.33

Table 4: Distribution based on USG findings

USG findings	Number of patients	Percentage (%)
Number		
Multiple	35	58.33
Solitary	25	41.67
Impacted stone		
Present	22	36.67
Absent	38	63.33
Pericholecystic collection		
Present	18	30
Absent	42	70
GB wall thickness		
Present	11	18.33
Absent	49	81.67

Table 5: Distribution based on assessment.

Surgeon's Opinion	Assessment	Number of patients	Percentage (%)
	Easy	42	70
	Difficult	10	16.67
	Very Difficult	8	13.33

RESULTS

The distribution based on pain characteristics among the evaluated patients is presented in Table 1. The data reveals that the majority of patients reported pain in the right hypochondrium (RHC), accounting for 76.67% of the total, while 23.33% reported pain in the epigastric (EPI) region. In terms of the character of pain, colicky pain was the most frequently reported (40%), followed by gripping and dull pain, each reported by 21.67% of the patients. Additionally, 20% of the patients reported back pain that radiated, while the majority (68.33%) did not report any radiating back pain.

Table 2 showcases the clinical features of the patients, focusing on the presence of symptoms. Among the patients, 63.33% experienced vomiting, and of those, 46.67% presented with dyspepsia. Additionally, 31.67% had fever.

Table 3 presents the per abdomen findings, focusing on tenderness, the presence of masses, and Murphy's sign. The data indicates that tenderness was predominantly observed in the right hypochondrium (RHC) in 73.33% of the patients, compared to 26.67% in the epigastric (EPI) region. Additionally, masses were present in 38.33% of the patients, and Murphy's sign was detected in 41.67% of the cases.

Table 4 illustrates the distribution based on ultrasound (USG) findings among the patients. It reveals that 58.33% of the patients had multiple findings while 41.67% had solitary findings. Regarding impacted stones, they were present in 36.67% of the cases and absent in 63.33%. Pericholecystic collection was observed in 30% of the patients, while 70% did not exhibit this feature. Furthermore, 18.33% had thickened gallbladder (GB) walls, whereas 81.67% did not display this characteristic.

The surgeon's opinion regarding the assessment of cases in the study is summarized in the table provided. The data indicates that 70% of the cases were deemed easy, while 16.67% were considered difficult, and 13.33% were categorized as very difficult.

DISCUSSION

Laparoscopic cholecystectomy is a common procedure and is often the initial procedure in laparoscopy training. However, technical difficulties may arise due to inflammation and adhesions, increasing the risk of complications such as bile duct injury, conversion to open surgery, increased bleeding, and prolonged surgical time.[8,9] The prediction of difficulty in laparoscopic cholecystectomy involves a multidimensional evaluation encompassing clinical, hematological, and radiological assessments. Clinical evaluation entails a thorough history taking, symptom analysis, and physical examination to identify possible complications and assess patient fitness. Hematological assessment analyzes blood markers to gauge inflammation severity and overall surgical suitability. Radiological imaging techniques provide insights into gallbladder condition, stone presence, and anatomical variations. Integrating data from these evaluations' aids in risk assessment, surgical planning, and optimizing patient outcomes in laparoscopic cholecystectomy. [10,11]

In our study, findings revealed impacted stones were present in 36.67% of the cases and absent in 63.33%. Pericholecystic collection was observed in 30% of the patients, while 70% did not display this characteristic. Moreover, 18.33% exhibited thickened gallbladder (GB) walls, while 81.67% did not demonstrate this characteristic. It is worth noting that Hutchinson et al, Liu et al, and Kama et al have highlighted the significance of gallbladder wall thickness as a primary sonographic risk factor for conversion to open cholecystectomy.[12,13,14]

Hence the utilization of clinical and ultrasonographic findings to predict the difficulty of laparoscopic cholecystectomy presents a valuable opportunity for informed decision-making and enhanced surgical planning. By leveraging these insights, both patients and surgeons can benefit from better preparedness and optimized management strategies, ultimately leading to improved outcomes in the surgical management of gallbladder conditions.

CONCLUSION

Preoperative evaluation has the potential to predict the likelihood of a challenging laparoscopic cholecystectomy (LC). This predictive information is valuable for both the patient and the treating surgeon in preparing for the surgery effectively.

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