RISK FACTORS AND REASONS OF CONVERSION FROM LAPAROSCOPIC TO OPEN HOLECYSTECTOMY

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ABSTRACT

Objective: To identify the frequency, associated risk factors and intraoperative reasons for conversion of Laparoscopic Cholecystectomy to open Cholecystectomy.

Study Design: Case series study.

Setting: General Surgery Department Hayatabad Medical Complex Peshawar.

Study duration: January 2021 to December 2021.

Material & Methods: The research comprised a total of 160 patients who were planned for laparoscopic cholecystectomy. ASA score, demographic information, Physical health status, Ultra sonogram Abdomen findings and the presence of pericholecystic fluid were all documented. Internal bleeding, visceral injury, equipment failure, and injury to the common bile duct were all reasons for converting from laparoscopic to open cholecystectomy.

Results: Total 160 patients undergoing either elective or emergency laparoscopic cholecystectomy were included in the study. Age ranged between 21-65 years with a mean age of 43 years ± 14.92 SD. Out of 160, 8(5%) patients required conversion from laparoscopic to open cholecystectomy, while 152(95%) surgeries performed successfully. The most common reason of conversion was dense inflammation in the calot's triangle 3(1.9%), followed by Mirrizi syndrome 2(1.2%), 1(0.6%) patient had ambiguous anatomy and 2(1.2%) patients were converted due to hemorrhage.

Conclusion: The most common reasons for conversion to open cholecystectomy are dense inflammation and adhesions, followed by mirrizi syndrome and hemorrhage.

Keywords: Conversion rate, Laparoscopic cholecystectomy, Open cholecystectomy, Risk factors.

INTRODUCTION

Gallstones are a prevalent source of abdominal pain, and this pain. Cholecystectomy is the only effective treatment for symptomatic gallstones1. In most cases, technological advancements have replaced open cholecystectomy (OC) with laparoscopic cholecystectomy (LC). The main reasons for this widespread acceptance are the benefits associated with laparoscopic cholecystectomy, such as the fact that it is a minimally invasive procedure, resulting in significantly reduced pain after the procedure, a shorter hospital stay, earlier recovery, and better cosmetic results. Because of these benefits, it is the first choice for gallstone treatment. However, there are several intraoperative reasons why a laparoscopic cholecystectomy must be converted to an open cholecystectomy.

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These causes might be related to the patient, the equipment, or the surgeon's expertise. Because of the aforementioned causes, the rate of conversion varies between studies, ranging from 2% to 15%.[2,3] It is nearly impossible to predict a patient's prospective conversion from LC to open based only on demographic and clinical characteristics.[4] The conversion to open surgery increases operating time, complication rates, treatment costs, and hospital stay.[5,6]

According to the available research, the following risks variables may predict conversion: acute cholecystitis, male gender, previous abdominal surgery and a thicker gallbladder wall on Ultrasound abdomen. Many studies, on the other hand, have failed to confirm that male gender is a risk factor for conversion; rather, they observed a combination of risk variables, including old age, acute cholecystitis, and a history of upper abdominal surgery[7].

The assessment of risk factors for conversion before surgery will assist the surgeon in choosing the right plan of action and, as a result, counselling the patient accordingly. This pre-hand detection is not achievable in many situations because iatrogenic bile duct damage, severe bleeding, or visceral injury may occur during laparoscopy and result in conversion. However, risk factors which can be predicted are identified by personal history, physical examination, laboratory tests,

ultrasound abdomen and pre anesthesia assessment etc [8,9].

The conversion in majority of the cases proves to be a wise decision as it helps to avoid further risks or damage to the patient. However, it is associated with longer operation time and hospital stay and reduces cost effectivity. Therefore, there is a need to identify the risk factors that may lead to conversion to open cholecystectomy[10].

Objective of the study is to determine the frequency of conversion of laparoscopic cholecystectomy to open cholecystectomy in a tertiary care teaching hospital and to determine the factors responsible for conversion.

MATERIAL & METHODS

This case series study was conducted in Surgical Department Hayatabad Medical Complex Peshawar from January 2021 to December 2021. After taking approval form hospital ethical committee a total of 160 patients were included in the study. Sample size was calculated using WHO software for sample size determination with 95% confidence level and 5% margin of error. Patients were selected by nonprobability consecutive sampling. Patients who were already planned for elective open cholecystectomy and for whom laparoscopic cholecystectomy was combined with other procedures were excluded from the study.

Detailed demographic information of the patients including name, age, gender, mode of admission (emergency or elective) their clinical and physical examination details, past history of laparotomies, BMI, ASA score, presence of comorbidities like diabetes & hypertension were noted. The main reason of conversion from laparoscopic to open surgery like haemorrhage, dense inflammation in the calots triangle, mirrizi syndrome, equipment failure etc were noted. Statistical analysis of the data was done using SPSS version 27.0. P-value ≤0.05 was considered significant.

RESULTS

Total 160 patients undergoing either elective or emergency laparoscopic cholecystectomy were included in the study. Male patients were 100(62.5%) & Female patients were 60(37.5%) respectively. Age ranged between 21-65 years with a mean age of 43 years ± 14.92 SD. Table-1

Out of 160, 8(5%) patients required conversion from laparoscopic to open cholecystectomy (Fig 1). The most common reason of conversion was dense inflammation in the calot's triangle 3(1.9%), followed by Mirrizi syndrome 2(1.2%), 1(0.6%) patient had ambiguous anatomy and 2(1.2%) patients were converted due to hemorrhage. Fig2.

Age distribution among 160 patients was analyzed as age group of 21-40 years 45(28.1%) patients, amongst whom 2(25%) were converted, 85 (53.1%) belonged to age group 41-60 years in this group 4(50%) patients converted to open chole and age group of >60 years there were only 30 patients out of which 2 (25%) were converted respectively. According to results there was no significant relationship between age and conversion rate (p-value 0.07). (Table-II)

There was significant association between ASA score and rate of conversion (p-value 0.028). Out of 08 converted cases, there is only 1(12.5%) patient having ASA score of 1, ASA score of 2 included 4(50%) and ASA score of ≥3 included 3 (37.5%) patients who converted to open surgery respectively (Table-III).

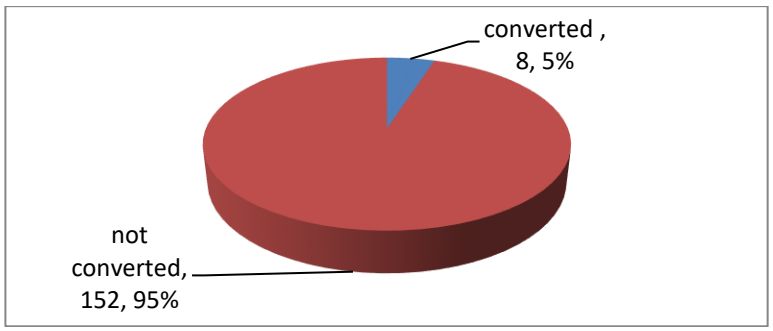

Figure1: Conversion rate

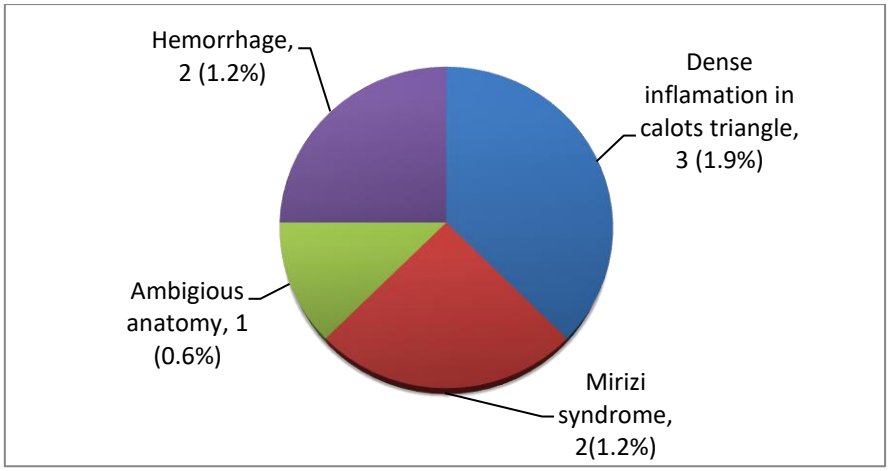

Figure 2: conversion factors

The most common reason of conversion was dense inflammation in the calot's triangle 3(1.9%), followed by Mirrizi syndrome 2(1.2%), 1(0.6%) patient had ambiguous anatomy and 2(1.2%) patients were converted due to hemorrhage

Table-I Demographic Details

Gender	Frequency	Percentage
Male	100	62.5
Female	60	37.5

Mean age = 43 ± 14.92 SD

Table-II: ASSOCIATION OF AGE WITH CONVERSION

Characteristics	Conversion		P-value
	Yes (n=8)	No (n=152)	
Age of Patient			0.07
21-40 years	3(15%)	90(64.2%)	
41-60 years	12 (60%)	35(25%)	
>60 years	5 (25%)	15(10.7%)	

Table-III: ASSOCIATION OF ASA SCORE WITH CONVERSION

ASA score	Number	Frequency	P value
1	1	12.5%	0.028
2	4	50%	
≥3	3	37.5%	

DISCUSSION

Conversion to open surgery from laparoscopic cholecystectomy is required when safe completion of the LC cannot be ensured. It is considered a sound judgment rather than a failure of the laparoscopic procedure and helps a great deal to avoid complications and reduce morbidity. The advantages and safety of LC have made it a standard procedure for the treatment of symptomatic gall stones. But in spite of its many advantages, 2-15% of conversion rates have been reported in various studies[11].

The decision for conversion of laparoscopic cholecystectomy to open cholecystectomy is quite difficult and it can be based upon spectrum of disease, presence of co morbidities, surgical expertise and technical factors involved.[12] The demographic parameters of the patient can also play a key role in the decision making. The delay in decision of conversion may cause significant complication in terms of serious iatrogenic injuries, so elective and early decision is preferable. The conversion rate is still quite high even though laparoscopic skills have improved with advancement of technology and increasing experience of laparoscopic surgeons[13].

In our study 5% patients were converted

from laparoscopic cholecystectomy to open cholecystectomy, which is similar to previous studies of Khatoon et al 6.46% & Paidipelly et al who found a conversion rate of 8.7%.[14,15,16] Some studies have reported very less conversion rate like Shamim M et al reported a conversion rate of 2.6% from LC to OC and Dalal et al reported a rate of 1.27%.[17,18] The literature reported a wide variation between conversion rates of laparoscopic to open cholecystectomy. This variation in rate of conversion ranges from 2% to 15%[19,20].

Patients who have certain preoperative risk factors are likely to encounter complications during surgery or postoperatively. Therefore, a pre hand thorough review of all the risk factors based on the history, physical examination and laboratory investigations before surgery will help the surgeons a great deal to encounter the difficulty during Laparoscopy.

Preoperative prediction of patients at increased risk of conversion to open cholecystectomy has several potential advantages. Low risk patients could be identified and appropriately scheduled in an ambulatory care facility, and selected as training cases for surgical trainees, whilst high risk patients should be appropriately counselled and operated by experienced surgeons or alternatively can be directly placed for open surgery.

CONCLUSION

The most common reasons for conversion to open cholecystectomy are dense inflammation and adhesions, followed by mirrizi syndrome and hemorrhage.

Patient selection is very important for efficient, safe training in Laparoscopic cholecystectomy. Based on the presented data, pathways could be suggested that enable the surgeon to precisely decide, during Laparoscopic cholecystectomy, when to convert to open surgery.

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