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RESEARCH ARTICLE
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FREQUENCY OF CONVERSION TO OPEN CHOLECYSTECTOMY IN PATIENTS UNDERGOING LAPAROSCOPIC CHOLECYSTECTOMY IN MTI-LADY READING HOSPITAL PESHAWAR

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ABSTRACT

Objective: The objective of this study was to assess the frequency of conversion to open cholecystectomy in patients undergoing laparoscopic cholecystectomy,

Methodology: A total of 120 patients, aged 18 years and above, were included in this prospective study. Patients were assessed preoperatively for demographic characteristics, including age, gender, and body mass index (BMI). The surgery was performed laparoscopically, and conversion to open cholecystectomy was recorded when necessary due to intraoperative complications such as bleeding, difficult anatomy, or severe adhesions. The reasons for conversion and the factors influencing the conversion rate were analyzed. Statistical analysis was conducted using descriptive statistics and the chi-square test to examine the relationship between categorical variables.

Results: Out of 120 patients, 10 (8.3%) required conversion to open surgery. The male gender (70%) and higher BMI (>24.9 kg/m²) (90%) were notably associated with conversion (p-value = 0.006 and 0.005, respectively). The leading causes for conversion included intraoperative bleeding (40%), adhesions (30%), and difficult anatomy (20%).

Conclusion: The conversion rate to open cholecystectomy was found to be 8.3%, with male gender and higher BMI identified as notable risk factors. Intraoperative complications such as bleeding, adhesions, and difficult anatomy were the main reasons for conversion.

Keywords: Laparoscopic cholecystectomy, conversion rate, open cholecystectomy, BMI, male gender, intraoperative complications, adhesions, difficult anatomy.

INTRODUCTION:

The occurrence of cholelithiasis is significant. Cholelithiasis manifests symptoms in about 50% of patients, yet cholecystectomy remains a frequently performed procedure. The occurrence of gallstones among patients varies from 5 to 22 percent, regardless of whether they exhibit symptoms

or not. [1, 2] Gallbladder surgeries offers lower morbidity, shorter post-operative hospital stays, quicker returns to daily activities, reduced postoperative pain, and a significant decrease in wound complications and postoperative issues in patients undergoing the procedure. Apart from to its numerous advantages, laparoscopy presents certain technological limitations that can increase the likelihood of an unwanted conversion from laparoscopic to open surgery, especially if chronic inflammation results in pericystic adhesions and conglutination. The extent of the surgical issue is influenced by the intensity of acute inflammatory modifications. Markers of inflammation in individuals diagnosed with acute cholecystitis.[3-5]
Laparoscopic cholecystectomy, as a relatively recent surgical technique, presents some drawbacks, including a steep learning curve, the availability of necessary instruments, and reliance on visual guidance. Consequently, it may occasionally prove to be a less efficient option for treating those suffering from gallstone disease. The necessity for conversion to an open method arises, as it is one of the most frequently performed procedures by surgeons. This approach is considered more reliable and offers a wider variety of options in the event of complications during laparoscopic techniques. The conversion rates are influenced by the severity of gallstone disease, the surgeon's skill level, and the anatomical features of the biliary tract. [6,7]

Even with progress in surgical equipment as well as improvements in skill with the laparoscopic tec hnique, conversion rates of as much as 10% are still being reported.The conversion may be strategic ally planned prior to the commencement of laparoscopy or may become necessary if complications arise throughout the procedure.In contrast to the planned conversion, this unplanned conversion is li nked to unfavorable case outcomes concerning operative times, postoperative results, and associate d costs.[7-11]

The purpose for examining the switch to open cholecystectomy in patients who undergone laparoscopic cholecystectomy is to comprehend the elements that affect the requirement for conversion, the related risks, and the consequences for patient outcomes. Examining the conversion rates and underlying reasons, along with the clinical outcomes, can assist in pinpointing preoperative risk factors, refining patient selection criteria, and informing surgical decision-making, thereby improving patient safety and reducing complications. This study seeks to deliver important insights regarding these challenges, ultimately enhancing surgical practices and optimizing the management of patients undergoing gallbladder surgery.

METHODOLOGY:

This observational study was conducted in the surgery department of Lady Reading Hospital, Peshawar, following the acquisition of ethical approval from the institution. The investigation was carried out over a span of six months, from January to June 2024, and involved 120 patients who satisfied the inclusion criteria. The participants in the study were aged 18 years and above. A thorough screening process was implemented to confirm that all participants met the criteria for laparoscopic surgery. Individuals were excluded from the study if they presented contraindications to laparoscopic cholecystectomy, including advanced malignancy, significant co-morbidities, or a history of upper abdominal surgery that could potentially impact the operative field.

A comprehensive preoperative assessment was conducted for each patient, encompassing an extensive medical history, physical examination, and required laboratory tests. The demographic details of the patients, including age, gender, and body mass index (BMI), were documented. The surgical history, especially concerning upper abdominal procedures, was documented to evaluate the potential risk of complications like adhesions, which are recognized for elevating the chances of transitioning to open surgery.

The surgical procedure for all patients was conducted by a skilled team of surgeons utilizing general anesthesia. The laparoscopic cholecystectomy was executed utilizing standard methodologies, incorporating the application of trocars and video assistance. The procedure would be evaluated for conversion to open surgery should any intraoperative complications occur that could not be addressed via laparoscopic techniques. The complications observed encompassed significant intraoperative bleeding, challenges in visualizing anatomical structures, severe adhesions, and anatomical variations that rendered laparoscopic dissection either impossible or hazardous.

The operating surgeon made intraoperative decisions about conversion, relying on clinical judgment and prioritizing patient safety. The conversion rate was documented, along with the factors contributing to the conversion. Following the surgical procedure, patients underwent careful observation for any complications that may arise postoperatively.

A statistical analysis was performed using SPSS 24 to assess the relationship between demographic and clinical characteristics and the probability of conversion. To summarize categorical variables such as gender, BMI, and reason for conversion, descriptive statistics, including frequencies and percentages, were employed. Continuous variables, including age, were examined through means and standard deviations. The chi-square test was utilized to investigate the association between categorical variables, with a p-value of less than 0.05 deemed statistically significant.

RESULTS:

The age of 120 patients ranged from 18 to 70 years, with a mean age of approximately 44.98 years (±15.96). The patients were grouped into three categories based on their age: 32.5% were between 18 to 35 years, 28.3% were between 36 to 50 years, and 39.2% were older than 50 years.

Regarding the gender distribution, 31.7% of the patients were male, while 68.3% were female. As for the body mass index (BMI), 52.5% of the patients had a BMI between 18 and 24.9 kg/m², and 47.5% had a BMI greater than 24.9 kg/m². The history of previous surgery was present in 8.3% of the patients, while the remaining 91.7% had no prior surgical history.

The frequency of conversion to open cholecystectomy was found to be 8.3%, with 10 out of 120 patients requiring conversion. The reasons for conversion were varied, with 10% of conversions attributed to inflammation of the gallbladder, 30% due to adhesion, 40% because of intraoperative bleeding, and 20% due to difficult anatomy.

Further analysis showed that gender and BMI had a notable association with conversion rates. Among the patients who required conversion, 70% were male, compared to 28.2% of males in the non-conversion group (p-value = 0.006). Additionally, a higher conversion rate was observed in patients with a BMI greater than 24.9 kg/m², where 90% of the conversions occurred in this group, compared to only 10% in the group with a BMI between 18 and 24.9 kg/m² (p-value = 0.005). Previous surgery also appeared to influence the conversion rate, with 60% of patients who had a history of prior surgery requiring conversion.

Table 1 Demographics and clinical characteristics

Demographic and clinical characteristics		Frequency	Percentage
Gender	Male	38	31.7%
	Female	82	68.3%
BMI (Kg/m^2)	18 to 24.9	63	52.5%
	> 24.9	57	47.5%
Previous surgery	Yes	10	8.3%
	No	110	91.7%

Figure 1 Age distribution of the patients (Years)

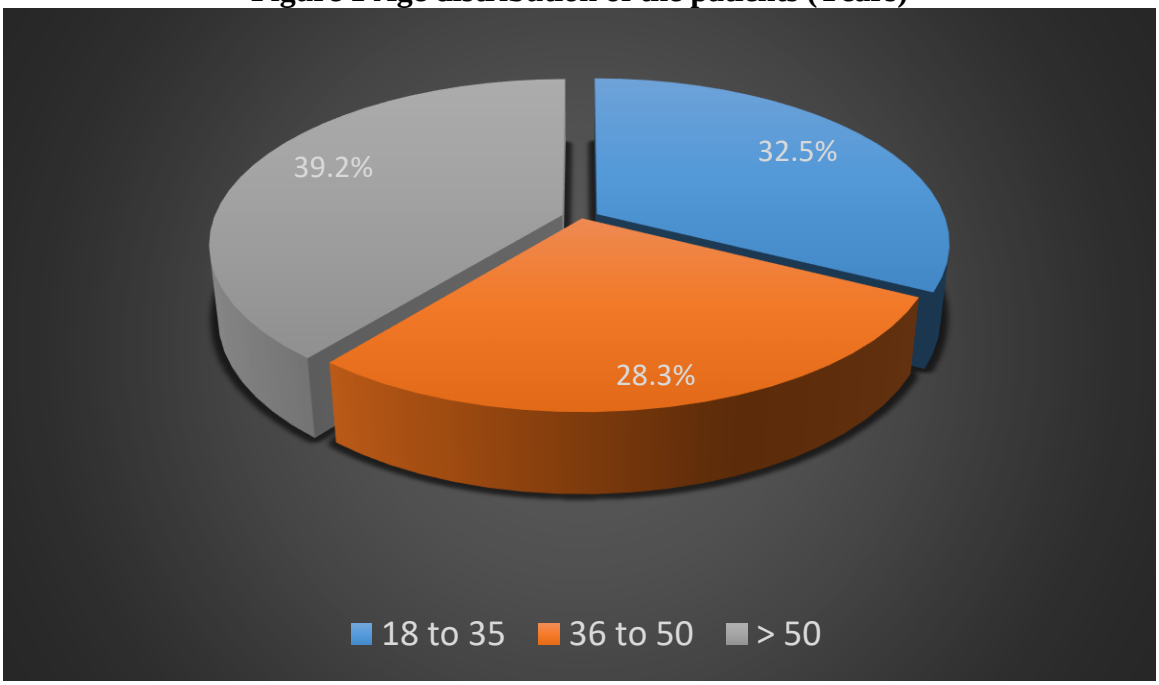

Table 2 Conversion to open cholecystectomy

Conversion to open cholecystectomy	Frequency	Percent
Yes	10	8.3
No	110	91.7
Total	120	100.0

Table 3 Reason of conversion

Reason of conversion	Frequency	Percent
Inflammation of gallbladder	1	10.0
Adhesion	3	30.0
Intraoperative bleeding	4	40.0
Difficult anatomy	2	20.0
Total	10	100.0

Table 4 Stratification of Conversion to open cholecystectomy with demographic and clinical characteristics

Demographic and clinical characteristics		Conversion to open cholecystectomy				P value
		Yes		No		
		N	%	N	%	
Gender	Male	7	70.0%	31	28.2%	0.006
	Female	3	30.0%	79	71.8%	
BMI (Kg/m^2)	18 to 24.9	1	10.0%	62	56.4%	0.005
	> 24.9	9	90.0%	48	43.6%	
Previous surgery	Yes	6	60.0%	4	3.6%	0.0001
	No	4	40.0%	106	96.4%	

DISCUSSION:

In our study we found that 8.3% of the 120 patients required conversion. Of these, a substantial proportion were male (70%) and had a higher BMI (90%). In our study, gender played a significant role in the conversion rate, with male patients representing the majority of those who required

conversion. This finding is consistent with the study by Randhawa SR et al., which also found a higher conversion rate among male patients. Men tend to have more complicated laparoscopic cholecystectomies due to anatomical differences such as a thicker abdominal wall and a higher likelihood of complications arising from gallbladder disease. Moreover, the male body typically presents more visceral fat around the gallbladder, which could complicate the dissection process during laparoscopic surgery.[12]

Similarly, the role of BMI in conversion rates was a key finding in our study. We observed that 90% of the conversions occurred in patients with a BMI greater than 24.9 kg/m². This is consistent with Iftikhar N et al., which emphasized that patients with a higher BMI are at an increased risk of complications during laparoscopic cholecystectomy.[13] The excess adipose tissue around the gallbladder and surrounding organs makes it more challenging to achieve proper visualization, increasing the likelihood of conversion to open surgery. Additionally, obesity often leads to increased intraoperative bleeding, which can further complicate the laparoscopic approach.

The reasons for conversion in our study were primarily intraoperative bleeding (40%), adhesions (30%), and difficult anatomy (20%). Intraoperative bleeding, as seen in our study, is one of the most common reasons for conversion. Studies such as those by Iftikhar N et al., have shown that when bleeding is not easily controlled through laparoscopic techniques, conversion to open surgery is often necessary to secure hemostasis and ensure patient safety.[13] Adhesions, particularly those from previous surgeries or inflammation, were also a leading cause of conversion in our study. This is consistent with the research by Randhawa SR et al., which noted that adhesions complicate the dissection process, making it difficult to safely separate the gallbladder from surrounding structures. In some cases, the dense adhesions may obscure the anatomical landmarks, making laparoscopic visualization impossible.[12] Our study's finding that 30% of conversions were due to adhesions underscores this challenge.

Difficult anatomy was responsible for 20% of the conversions in our study. This is another common cause of conversion to open surgery, particularly when the gallbladder is distorted due to chronic disease or anatomical variations. As noted Ummair M et al, difficult anatomy can make it difficult for the surgeon to identify key structures, increasing the risk of injury during the laparoscopic procedure. In our study, this factor was less prevalent than bleeding and adhesions but still played a significant role in the need for conversion.[14]

CONCLUSION:

In summary, our findings indicate that the conversion rate from laparoscopic to open cholecystectomy stands at 8.3%. Factors such as male gender, elevated BMI, and a history of abdominal surgery are significantly linked to the necessity for conversion. Complications encountered during the procedure, including bleeding, adhesions, and challenging anatomical structures, were the main factors leading to conversion. The results highlight the critical need for thorough preoperative assessment and meticulous surgical planning, especially for individuals with elevated BMI or a background of prior surgeries, to reduce the likelihood of conversion and enhance surgical results.

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