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ORIGINAL ARTICLE

Indicators for conversion from laparoscopic to open cholecystectomy. A clinical study.

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ABSTRACT… Objective: To determine the reason that why laparoscopic cholecystectomy should be shifted to open surgery. **Study Design:** Retrospective study. **Setting:** Department of General Surgery, LRH, Peshawar. **Period:** January 1, 2018 and December 31, 2021. **Material & Methods:** The study included 256 people who were scheduled for laparoscopy but later switched to laparotomy, while the remaining 258 patients who did not switch were included in the control group. They were divided into two groups using sealed opaque envelopes with randomly generated computer numbers. Variables considered for switching included anatomical abnormalities, gender, age, acute and chronic cholecystitis, inflammatory infiltration, peritoneal adhesions, cardiac disease, hypertension, neurological disorders, diabetes, and other medical conditions of the patient. Variables were compared using the chi-square test with a statistical significance level of 5%. Odds ratios (OR) and 95% confidence intervals (CIs) were calculated. **Results:** The mean age of the intervention group was 64 years, compared to 54 years for the control group. There was highly significant difference between the two groups regarding age, gender, anatomical abnormalities, acute and chronic cholecystitis, inflammatory infiltration, cardiac disease, hypertension, neurological disorders conversion variable from laparoscopy to laparotomy. **Conclusion:** Proper treatment planning and consideration of studied variable before decision of the choosing the procedure is required.

Key words: Cholelithiasis, Laparoscopy, Lapratomy, Variables.

INTRODUCTION

Cholelithiasis is a common medical condition that requires medical attention. The primary treatment for this condition is the surgical removal of the Gall bladder, a procedure known as cholecystectomy. When performed ideally, this procedure carries minimal risks of surgical complications and hospitalization and is considered the standard treatment for gallstones.[1-5]

Laparoscopic cholecystectomy is a common operation world wide, generally performed as optional surgery with low mortality and morbidity. It has been reported that 1.8 –27.7 of laparoscopic cholecystectomies are converted to open surgery during the operation. Converted cases are associated with increased postoperative complications.[6-11]

In the unwanted circumstance during the process numerous cases of laparoscopic cholecystectomies are redirected to open surgeries despite the fact that hospital stays along with mortality and morbidity rates are maximum in open surgeries as compared to laparoscopic surgeries.[7-9] However, certain anatomical abnormalities and difficulties during surgery may require open surgical incisions instead of laparoscopic surgery, which can increase the risks of hospital stays, morbidity, and mortality.[12-15] Despite these risks, surgical incisions are sometimes necessary. Predictive conversion factors are used to maximize the cost-effectiveness of bile stone therapy while enhancing patient comfort. The basic aim of the study was to determine the reason/ Indicators for conversion from laparoscopic to open cholecystectomy.

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MATERIAL & METHODS

The study was conducted retrospectively on patients who met the clinical and biochemical criteria for acute inflammation and underwent laparoscopic surgery at the Department of General Surgery between January 1, 2018 and December 31, 2021 after approved from institutional review board (338/LRH/MTI).

Ultrasound was used to confirm the diagnosis of gall bladder stones, and compulsory laboratory testing was performed prior to the procedure. All surgeries were carried out aseptically in the operating room, following standard surgical protocols under the supervision of experienced surgeons. The same procedure was followed for all patients who underwent laparoscopic surgery.

Prior consent from the patient was mandatory before any surgical procedure. Even if the surgical team decided to switch from laparoscopy to laparotomy, patient consent was still required. The operating room requirements and aseptic techniques were strictly followed. For the research, 256 patient records who initially underwent laparoscopy but were later converted to laparotomy were thoroughly checked and studied retrospectively, while the remaining patients who were not converted were included in the control group (n=258). The variables inspected for switching included anatomical abnormalities, sex, age, acute and chronic cholecystitis, inflammatory infiltration, peritoneal adhesions, heart diseases, hypertension, neurological disorders, diabetes, and patient's other morbid conditions. Additionally, specific reports regarding the conversion to open surgery were also examined.

The analysis was performed using SPSS version 21. Variables were compared using the Chi-squared test with a statistical significance level of 5%. Odds ratio (OR) and 95% confidence intervals (CIs) were calculated.

RESULTS

In the descriptive study, the control group had a mean age of 54 years with a standard deviation of 14.4, while the mean age of the study group was 64 with a standard deviation of 16.2. The control group had 21% males (n=54) and the study group had 43% males (n=110). Group B patients underwent open surgery, while Group A was used as a control. A table was provided to demonstrate the factors observed when deciding to convert cholecystectomy to open surgery. The majority of potential risk factors are significantly higher in the study group ($p < 0.05$) including age and gender.

Risk Factors	Groups				OR	P-Value
	Control		Study			
	N	%	N	%		
Age >60 years	84	32.8%	175	68.4%	4.33 (2.98–6.25)	0.0000
Male	54	21%	110	43%	2.54 (1.96–3.82)	0.0000
Anatomy doubt	0	0.0%	12	4.5%	×	0.0015
Acute cholecystitis	48	19.2%	179	68.4%	9.52 (6.54–14.33)	0.0000
Chronic cholecystitis	49	18.4%	52	21.0%	1.12 (0.80–1.46)	0.7431
Inflammatory infiltrate (cells)	85	34.0%	207	77.4%	7.73 (5.22–11.54)	0.0000
Peritoneal adhesions	42	16.0%	34	12.7%	0.71 (0.53–1.40)	0.2173
Emergency (acute) treatment	49	18.4%	169	63.8%	7.64 (5.14–11.44)	0.0000
Diabetes	20	7.4%	44	17.0%	2.73 (1.62–4.78)	0.0005
Hypertension	54	19.7%	97	36.4%	2.26 (1.64–3.51)	0.0000
Heart diseases	18	5.8%	49	18.6%	3.82 (2.10–6.76)	0.0000
Neurological diseases	04	1.2%	2	7.0%	6.52 (1.75–22.85)	0.0009
Conversion rate = 21.9%						

Table-I. Indicators (Risk factors) that cholecystectomy switched to open surgery

DISCUSSION

The conversion rate from cholecystectomy to surgical incision for acute inflammation varies in literature, ranging from 2% to 25%. Our series found a 21.9% rate, consistent with literature.[13-14] As per the study the age and gender of the respondents are infact important risk factors for unintentional surgical incision like the previous studies.[13-14]

The analysis indicated that older age was a noteworthy risk factor for conversion to open surgery during the procedure.[14]

Male gender is recognized as the primary risk factor for conversion, along with a higher ASA score. The inflammatory condition of the gall bladder is also an essential factor in conversion, and extirpation conversion rate is more significant in male patients, as acknowledged by most surgeons.

There was no correlation found between temperature, diabetes, or white blood cell count with the conversion to open surgery. However, some studies[10,15] suggested that higher fever greater than 38°C may increase the conversion rate. There were no significant differences in mean leukocyte counts between the two groups. Additionally, obesity was not found to be a significant risk factor for conversion based on a study ($p=0.077$).

The study found a connection between preoperative issues, such as scars and hernias, and the difficult anatomy of the carlot's triangle, which may require conversion to laparotomy. Poor anatomical knowledge due to adhesions and inflammation, unexpected surgical outcomes, and trauma are the main reasons for conversion to an open route. The study also discovered that problematic dissection, which often occurs after adhesion or inflammation, or unclear anatomy (14%), is a probable cause of conversion. These findings align with previous research[8-10] on the subject.

CONCLUSION

There was highly significant difference between the two groups regarding studied risk factors so consideration of these variables is required before decision of the choosing the procedure.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

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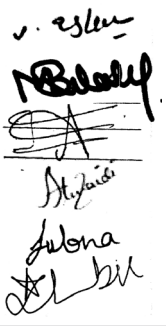
1	Viqar Aslam	Data collection, Analysis, Interpretation and literature review.	
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4	Alina Zaidi	Study designing and collection and paper write up.	
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