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Outcome of laparoscopic cholecystectomy with and without drains at Ayub teaching hospital

Ismail Akbar
Associate Professor General Surgery, Ayub Teaching Hospital, Abbottabad, Pakistan

Syed Aamer Hussain
Speciality Registrar Surgery, Ayub Teaching Hospital, Abbottabad, Pakistan
Corresponding author email: aamer183@hotmail.com

Hafeez
PGR General Surgery, Ayub Teaching Hospital, Abbottabad, Pakistan

Ali Gohar Khan
Associate Professor General Surgery, Fauji Foundation Hospital, Peshawar Cantt, Pakistan

Syeda Sumar Shah
Post graduate Resident, General Surgery, Ayub Teaching Hospital, Abbottabad, Pakistan

Mahnoor Nazir Afridi
Post Graduate Resident General Surgery, Ayub Teaching Hospital, Abbottabad, Pakistan

Shumaila Khalid
Post graduate Resident, Ayub Teaching Hospital, Abbottabad, Pakistan

Abstract---Introduction: In terms of surgery, cholecystectomy performed using laparoscopy is the current standard of care for Cholelithiasis. This operation is by far the most common type of surgery done today. However, the literature is still divided on whether or not drainage should be performed following an elective laparoscopic cholecystectomy. Objectives: The aim of this study was to examine whether or not patients undergoing laparoscopic cholecystectomy at Ayub Teaching Hospital, Abbottabad were more likely to develop an infection in the wound if a drain was used. Results evaluation: Checks for wound infections were performed for up to a month after surgery to determine the outcome. Study Design: The study used a

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randomized controlled trial design. Settings: The study lasted for six months, from January 01, 2022, to June 30, 2022, and took place in the Department of General Surgery, Ayub Teaching Hospital, Abbottabad. Subjects: Patients having laparoscopic cholecystectomy for gall bladder disease were used as subjects. Methods: One hundred sixty-four patients were randomly assigned to either group A (no drain) or group B (drain used), and after undergoing the corresponding treatment, patients in both groups were followed up with at regular intervals for up to a month to check for signs of wound infection. Results: The average age of the study participants was 46.10± 9.07, and 84.8% of the patients were female. Overall, 4.9% of group a participants and 19.5% of group B participants developed wound infections. The p-value for this difference was found to be significantly lower than 0.004. Based on the results of the stratification, the difference was barely noticeable among the male patients and the diabetics. Conclusion: Our research concluded that the use of a drain after a laparoscopic cholecystectomy was associated with a higher rate of wound infection than did the use of no drain.

***Keywords*---**cholelithiasis, laparoscopic cholecystectomy, surgical drainage.

Introduction

One of the most prevalent reasons for abdominal surgery is the removal of gallstones. Gallstones become more common as people age, and this is true across all ethnicities and sexes. In the wake of the advent of laparoscopic cholecystectomy (LC) about two decades ago and its subsequent use as an outpatient treatment, many surgeons today consider cholecystectomy to be a straightforward operation from which patients can quickly recover [1]. The procedure known as laparoscopic cholecystectomy (LC) is one of the most prevalent surgical procedures [2]. Advantages like fewer pain and discomfort after surgery and a quicker recovery time are universally acknowledged benefits. The key to a good LC operation is a safe dissection [3]. It is technically challenging, time consuming, as most research reported separate, and multiple ligations of cystic duct and artery. However, many patients experience postoperative nausea and vomiting in addition to stomach pain and pain in the shoulders [4]. It was speculated that carbon dioxide gas utilized in a pneumoperitoneum procedure caused the problems. This necessitates the insertion of a drainage tube. Open cholecystectomy has been controversial because of the questionable benefit of surgical drainage [5].

It has been accepted practice for many decades that abdominal drainage is necessary following any kind of surgery. Given that LC is one of the most popular abdominal surgical procedures, the drainage issue is often overlooked. Routine drainage following LC, however, is now a contentious issue [6]. Most surgeons would rather not deal with the complications of an intra-abdominal abscess, which can be fatal if not treated promptly. This can be done by inserting drainage to remove debris and clots and by catching postoperative issues before they worsen. Perforated appendicitis and ulcer perforation are examples of contaminated surgeries in which drainage has not been proved to prevent infection or leaking. Because of this, all surgeons have been worried about this issue [7]. Eighteen point seven five percent wound infection was reported by Yang et al.

In laparoscopic cholecystectomy, the infection rate was 5% in the non-drainage group against 1% in the drainage group. Due to conflicting reports in the literature, it was decided to conduct this study to determine the frequency with which laparoscopic cholecystectomies requiring a drain also result in wound infections compared to those that do not require a drain. Cholelithiasis patients will benefit from our research since it will allow us to provide them with a safer treatment option. This will lessen the load on hospital authorities in terms of the need for additional beds and less money, and it will improve the quality of life for the patients whose illnesses are less severe.

Sample size

Laparoscopic cholecystectomy patients (n=164), split into two groups of 82. In order to determine the necessary sample size, we used the parameters P1 = 18.75% and p2 = 5%. Open epi software was used to conduct a study with a sample size of eight, a significance level of 95%, a power of test of 80%, and a dependent variable of interest (wound infection after laparoscopic cholecystectomy with drain versus no drain).

Inclusion criterion

- Sexual orientation; male and female patients are accepted.
- The 25-to-60-year-old demographic is covered.
- Patients with gallstones who are having a laparoscopic cholecystectomy.

Exclusion criterion

- People with hemoglobin (Hb) levels below 8 g/dl
- In the liver that persists over time (confirmed from patient record file).
- Misuse of alcohol also causes: (confirmed from patient history which was deemed as positive if patient has consumed one glass daily for more than 1 year)
- Females who are expecting a child (confirmed from patient record file)

Data analysis

The information was recorded and analyzed using SPSS 16. Frequencies and ratios were used to illustrate qualitative factors including gender, body mass index, and wound infection. Statistically significant variables like those that age was understood to indicate mean SD. Chi-square analysis with a 95% confidence interval was used to compare the two groups on the outcome variable (wound infection). Gender and body mass index were used to divide patients into groups to manage these effect modifiers. We used a Chi-square test after stratifying the sample, and we regarded a value of p0.05 to indicate statistical significance.

Results

A grand total of 164 patients No participants dropped out of the trial, and none were lost to follow-up. Patients had a mean SD age of 46.10 9.07, with a higher proportion of female patients overall (84.8%), and the majority of patients (55.5%, P .05) had a body mass index (BMI) 25kg/m2. You may refer to Tables I, II, and III.

Table-1	Gender	
	Frequency	Percent
Female	139	84.8
Male	25	15.2
Total	164	100.0

Table-II BMI (Kg/m2)		
	Frequency	Percent
< 25	73	44.5
≥25	91	55.5
Total	164	100.0

Table I, 2: Shows the frequency of male and female patients and BMI categorization of the participants in the study

N	Mean	46.10
	Std. Deviation	9.070

Table III: Shows the mean ±SD age of the participants in the study.

	Frequency	
No diabetes	127	77.4
Diabetes Present	37	22.6
Total	164	100.0
	Frequency	Percent
No diabetes	127	77.4
Diabetes Present	37	22.6
Total	164	100.0

Table IV: Shows the frequency of diabetes among the participants of the study and that 22.6% of patients also had diabetes

		Gender		
		Female	Male	Total
Group of study	Group A (no drain)	71	11	82
	Group B (drain used)	68	14	82
Total		139	25	164

Table V: Show the gender comparison of the two groups.

Tables V, VI, and VII compare the two sets of data in terms of gender, diabetes prevalence, and body mass index classification.

About 12.2% of research participants experienced infection at their ports, while the rest showed no symptoms of infection. Take a look at Table VIII and Figure X.

	Table- VII	Presence of Diabetes		
		No diabetes	Diabetes Present	Total
Group ofstudy	Group A (no drain)	65	17	82
	Group B (drain used)	62	20	82
Total		127	37	164

Table VI: Shows comparison of number of diabetic patients in the two groups.

		BMI (Kg/m2)		
		< 25	> 25	Total
Group of study	Group A (no drain)	30	52	82
	Group B (drain used)	43	39	82
Total		73	91	164

Table VII: Shows the BMI makeup of the two groups.

	Frequency	Percent
No infection	144	87.8
infection occurred	20	12.2
Total	164	100.0

Table VIII: Shows the frequency of wound infection among the participants of the study.

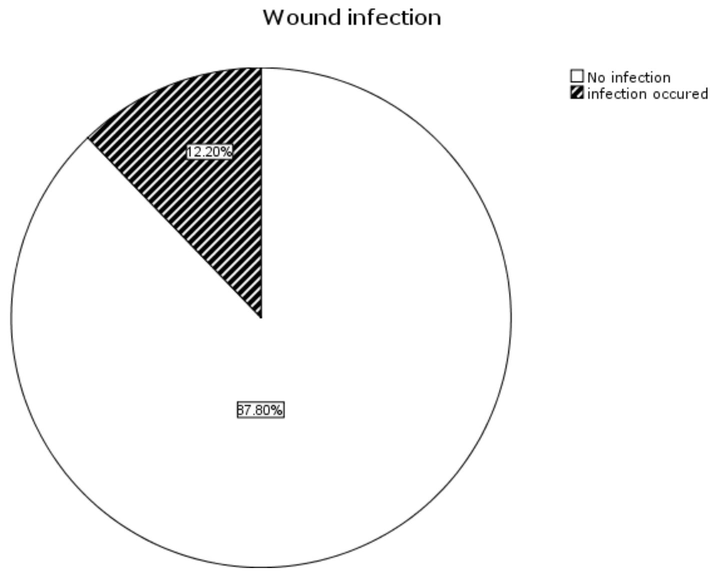

Figure 1. Pie chart shows the frequency of wound infectionamong the participants of the study overall.

Patients in Group A, who underwent laparoscopic cholecystectomy without a drain, had a wound infection at a rate of 4.9%, higher than the rate in Group B, who used a drain. Infection; nevertheless, a significantly higher percentage of patients in group B (19.5%) were affected by this consequence. It was determined that this difference was statistically significant (p = 0.004). check out Table IX.

			Wound infection: No infection	Wound infection: infection occurred	Pearson Chi-square (P-value)
Group of study	Group A (no drain)	Count	78	4	
		% within Group ofstudy	95.1%	4.9%	
	Group B (drain used)	Count	66	16	
		% within Group ofstudy	80.5%	19.5%	0.004
Total		Count	144	20	

% within Group ofstudy	87.8%	12.2%

Table IX: Shows the comparison of wound infection among the two groups of the study.

When the participants were divided into two groups based on their gender, it was found that there was a statistically significant difference in the rate of wound infection between the two groups among the female participants (p=0.005), but no such difference among the male participants (p=0.366). Check out Table X.

Gender				Wound infection: No infection	Wound infection: infection occurred	Pearson Chi-square (P-value)
Female	Group of study	Group A (no drain)	Count	67	4	0.005
			% within Group of study	94.4%	5.6%	
		Group B (drain used)	Count	53	15	
			% within Group of study	77.9%	22.1%	
		Total	Count	120	19	
			% within Group of study	86.3%	13.7%	
Male	Group of study	Group A (no drain)	Count	11	0	.366
			% within Group of study	100.0%	.0%	
		Group B (drain used)	Count	13	1	
			% within Group of study	92.9%	7.1%	
		Total	Count	24	1	
			% within Group of study	96.0%	4.0%	

Table X: Table shows the comparison of wound infection between the two groups with stratification using gender.

When patients were divided into two groups based on their body mass index, it became clear that Group B had a significantly higher rate of wound infection than Group A. Look at XI.Table.

BMI (Kg/m2)				Wound infection: No infection	Wound infection: infection occurred	Pearson Chi-square (P-value)
< 25	Group of study	Group A (no drain)	Count	30	0	0.053
			% within Group of study	100.0%	.0%	
		Group B (drain used)	Count	38	5	
			% within Group of study	88.4%	11.6%	
		Total	Count	68	5	
			% within Group of study	93.2%	6.8%	
> 25	Group of study	Group A (no drain)	Count	48	4	0.009
			% within Group of study	92.3%	7.7%	
		Group B (drain used)	Count	28	11	
			% within Group of study	71.8%	28.2%	
		Total	Count	76	15	
			% within Group of study	83.5%	16.5%	

Table XI: Illustration of comparison of wound infection among the two groups when stratified on the basis of BMI categories.

Presence of Diabetes				Wound infection: No infection	Wound infection: infection occurred	Pearson Chi-square (P-value)
No diabetes	Group of study	Group A (no drain)	Count	63	2	0.012
			% within Group of study	96.9%	3.1%	
		Group B (drain used)	Count	52	10	
			% within Group of study	83.9%	16.1%	
	Total		Count	115	12	
			% within Group of study	90.6%	9.4%	
Diabetes Present	Group of study	Group A (no drain)	Count	15	2	
			% within Group of study	88.2%	11.8%	
		Group B (drain used)	Count	14	6	
			% within Group of			

			study	70.0%	30.0%	0.176
	Total		Count	29	8	
			% within Group of study	78.4%	21.6%	

Table XII: Shows the comparison of wound infection among thetwo groups when stratified for the presence of diabetes

When patients were divided into two groups based on their diabetes status, a significant difference in the rate of wound infection was found among the non-diabetic patients (with group B having greater frequency of wound infection, p=0.012), but there was no difference between the diabetic patients of the two groups (p=0.176).

Discussion

Our study's demographics showed that, on average, our patients were younger than those in a previous study by Kim et al 56 (mean 57.0± 14.7). In addition, as Cholelithiasis is more common in women, women accounted for the majority of patients (84.8%). In addition, 55.5% of our study participants had a body mass index (BMI) of 25 or higher. Accordingly, our findings indirectly support the adage that Cholelithiasis is more common among women over the age of 40 who are fertile and overweight [8-10]. When compared to other studies, including one that found an overall infection rate of 3.6%, our study's 12.2% risk of post-operative wound infection was extremely high. 56 A wound infection rate of about 11.87% was found in a separate investigation with findings that were similar to ours. 58 Our study may have overestimated the overall rate of wound infection because it included individuals with acute cholecystitis. It is more common for people with acute cholecystitis to develop wound infections than those with simple cholelithiasis [11-13].

Patients in Group A who underwent cholecystectomy but did not have a drain implanted at the conclusion of the procedure had a significantly reduced rate of wound infection than those in Group B (p=0.004, see Table IX). Several prior studies found similar findings; for example, one found a statistically significant increase in wound infections among the drain group (18.75%) compared to the no drain group (5%). 58 Consistent with the findings of Gurusamy et al., other researchers also saw similar patterns. 60 However, other studies have shown discrepant findings, showing that there was no statistically significant difference in the rate of wound infection whether a drain was utilised or not [14-15]. Laparoscopic cholecystectomy has adopted the practise of open cholecystectomy, which involves the placement of a regular drain after the procedure. Recommends drainage for the standard open cholecystectomy. Multiple retrospective studies and a few prospective studies have examined the efficacy of drains in traditional cholecystectomy. The pooled results of these trials support the use of drains following cholecystectomy [16-17]. However, it has been called into question due to the routine use of drains after laparoscopic cholecystectomy. Due to a lack of knowledge and full faith in the clipping devices, drains were employed at first. However, as more and more surgeons gained experience with laparoscopic techniques, it became clear that these procedures reduced the need for draining of the gallbladder bed since they allowed for more anatomically precise operations and caused less trauma to the surgical bed. The surgeon can apply the cautery with greater accuracy and precision during laparoscopic procedures. Magnification of the bile ducts and duct of Lusca during laparoscopic cholecystectomy improves surgical safety. Moreover, if the appropriate surgical method is used, entering the liver parenchyma can be avoided, resulting in a safer treatment and a faster recovery for our patients [18].

Our study's stratification results were also noteworthy, showing that there was no statistically significant difference in the rates of wound infection between the two groups of male patients. There were probably fewer male patients, which could explain these findings. In addition, although there was no statistically significant difference between the two groups of diabetic patients, this may be because diabetes is a known risk factor for post-operative wound infection. Other benefits of not inserting drains after a laparoscopic cholecystectomy include a shorter recovery time and reduced postoperative pain and discomfort [19-20]. Our findings support the concept that laparoscopic cholecystectomy patients had a higher than average rate of wound infection. It was established that employing a drain is preferable to doing a laparoscopic cholecystectomy without drains. Our study has limitations due to its inability to compare the two procedures in terms of additional postoperative consequences (such as postoperative discomfort or subhepatic collection).

Conclusion

Our research indicates that the use of a drain after a laparoscopic cholecystectomy increases the risk of wound infection.

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