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Comparison of Outcome After Laparoscopic Cholecystectomy with Drainage Vs No Drainage

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ABSTRACT

Objective: To compare the outcome after laparoscopic cholecystectomy with drainage vs no drainage
Study Design: Comparative Cross-sectional Study
Setting and Duration of Study: Combined Military Hospital Rawalpindi, Pakistan Feb 2021 to Nov 2021
Methodology: A prospective study was conducted on 500 patients who underwent laparoscopic cholecystectomy for cholecystitis secondary to gall stones during the study period. Patients were divided into two groups on the basis of lottery method. Drain was not placed in patients in group A while it was placed in patients in group B. Both the groups were followed up for ten days for presence of complications like pain, port site infection, bleeding and bile leakage.
Results: Out of 500 patients included in the final analysis 167(33.4%) were male and 333(66.6%) were female. Mean age of patients put who underwent laparoscopic surgery for cholelithiasis leading to cholecystitis in our study was 42.78±9.776 years. 269(53.8%) patients did not receive drain after the surgery while 231(46.2%) received the drain. Pearson chi-square test revealed that bleeding and port site infection occurred statistically significantly more in patients receiving drain (p-value<0.05) while pain and bile leakage did not show any such difference in both the groups (p-value>0.05).
Conclusion: Routine use of drain after cholecystectomy emerged counter therapeutic in our study as patients which had drain in place had more chances of bleeding and port site infection as compared to those in which there was no drain in place. Other complications like pain and bile leakage occurred independent of drain use or no use.

Keywords: Complications; Drain; laparoscopic cholecystectomy

How to Cite This Article: *Kamal T, Sarfaraz K, Naz FU, Khaskheli AJ, Khan MH, Aftab REZ. Comparison of Outcome After Laparoscopic Cholecystectomy with Drainage Vs No Drainage. Pak Armed Forces Med J 2025; 75(Suppl-5): S697-S700. DOI: https://doi.org/10.51253/pafmj.v75iSUPPL-5.8093*

INTRODUCTION

Last few decades have been revolutionary in terms of abdominal surgery procedures.[1] No method has been found totally free of complications, though promising results have been generated regarding methods which are less invasive.[2] Techniques and steps of minimally invasive methods like laparoscopic and robotic surgeries are still evolving so that patients can get maximum benefit out of it especially in terms of postoperative complications.[3] No fixed guidelines exist in this regard and utilization of these services depend upon availability of equipment and expertise.

Despite use of minimally invasive methods in routine, still basic surgical skills remain same as in difficult cases usually solution arise from basic methods and skills.[4] Use of drain after minimally invasive procedures like laparoscopic cholecystectomy has always been an interesting debate among the surgeons.[5] There have been few clinical indications for putting of drain after laparoscopic surgeries but routine use of drain in these surgeries is still controversial.[6]

Impact of putting drain or not putting drain on outcome after laparoscopic cholecystectomy has been under discussion of surgeons and some work has been done and published in this regard. Sharma *et al.* published a study in 2016 on patients undergoing elective laparoscopic cholecystectomy in in India. They concluded that all the post-surgical complications may they be major or minor were not different in patients with and without placement of drain after the surgical procedure.[7] Cirocchi *et al*. in 2021 published an analysis on drain insertion after the surgery and revealed that even presence of acute cholecystitis is not an indication for routine insertion of drain after the surgery.[8] Yang *et al.* in their study concluded that use of drain was effective in reducing these complications among these patients.[9] Seeing variable results in literature and routine practice in surgical centers of our part of the world it becomes important to look for better management option in this context.

Laparoscopic surgery though widely performed in Pakistan but still considered as more expensive and advanced form of abdominal surgery. Limited trained

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Received: 02 Feb 2022; revision received: 21 May 2022; accepted: 21 Jun 2022

professionals have been available for this task in surgical units all across the country. A recent local study conducted in Charsaddah concluded that if drain is placed after the surgical procedure, it gives no added benefit in terms of shortening the length of admission and prevention of post-operative complications.[10] Limited local data has been available regarding routine use of drain after laparoscopic cholecystectomy. We therefore planned this study with the rationale to compare the outcome after laparoscopic cholecystectomy with drainage vs no drainage.

METHODOLOGY

This comparative cross-sectional study was conducted at the Surgical Department of Combined Military Hospital Rawalpindi, Pakistan from February 2021 to September 2021. Sample size was calculated by WHO Sample Size Calculator by using population prevalence proportion of complications with drain after laparoscopic cholecystectomy as 12.5%.[11] Non probability Consecutive sampling technique was used to gather the sample.

Inclusion Criteria: All patients between the age of 15 and 70 years who underwent laparoscopic management for chloelithiasis leading to cholecyctitis were included in the study.

Exclusion Criteria: Patients with uncontrolled diabetes or hypertension or any other physical illness. Patients with a known gallbladder carcinoma or any other solid or hematological malignancy were also made part of the exclusion criteria. Those undergoing redo surgeries or had compromised cardiovascular or respiratory status were also excluded.

After ethical approval from the ethical review board committee (via letter no.230/12/21) patients who met the inclusion/exclusion criteria were recruited in the study. Laparoscopic cholecystectomy was performed by consultant surgeon via set protocols.[12] Patients were randomized via lottery method for putting of drain after the surgery. Patients in group A received the drain while patients in Group B did not receive the drain after the surgery. Drain was placed by the treating surgeon as per set surgical protocols.[13] All other measures including administration of antibiotics and pain killers was done according to set criteria and was kept uniform as much as possible in all the study participants. Complications like port site infection, biliary leakage and bleeding were diagnosed by consultant surgeon on the basis of clinical, laboratory and radiological findings.[14] Pain was considered significant if rated more than 6 at visual analogue scale by the patient.

Statistical Package for the social sciences (SPSS) version 23.00 was the software in which all the data for this study was entered and processed. Frequency and percentages for gender, patients receiving drain and all the complications in both the groups were calculated. Mean and standard deviation for age was also calculated for the study participants. Pearson chi-square test by keeping the p-value<0.05 as significant was used to look for the significant difference in complications in both the groups.

RESULTS

Out of 500 patients included in the final analysis 167(33.4%) were male and 333(66.6%) were female. Mean age of patients put who underwent laparoscopic surgery for cholelithiasis leading to cholecystitis in our study was 42.78±9.776 years. Table-1 summarized the general characteristics of study participants.269(53.8%) patients did not receive drain after the surgery while 231(46.2%) received the drain. Mean duration of hospital stay for study participants in our study was 3.23±3.744 days. 63(12.6%) had bleeding, 14(2.8%) had bile leakage, 248(49.6%) had pain while 143(28.6%) had port site infection.

Table-I: Characteristics of Patients Undergoing Laparoscopic Cholecystectomy

Study Parameters	n(%)
Age(years)	
Mean + SD	42.78 ±9.776 years
Range (min-max)	21 years-65 years
Gender	
Male	167(33.4%)
Female	333(66.6%)
Mean duration of hospital stay	3.23±3.744 days
Drain in place	
No	269(53.8%)
Yes	231(46.2%)
Complications	
Bleeding	63(12.6%)
Bile leakage	14(2.8%)
Pain	248(49.6%)
Port site infection	143(28.6%)

Table-II summarized the results of statistical analysis. It was revealed that bleeding (p-value-0.003) and port site infection (p-value-0.006) occurred statistically significantly more in patients receiving drain after the main surgical procedure while pain (p-value-0.406) and bile leakage (p-value-0.124) did not

show any such difference in patients who underwent drain insertion and those who did not undergo drain insertion after the surgery.

Table-II: Difference In Outcome Parameters In Patients With and Without Drain

Outcome parameters	No drain in place	Drain in place	*p*-value
Bleeding			
No	246(91.4%)	191(82.6%)	0.003
Yes	23(8.6%)	40(17.4%)	
Bile leakage			
No	263(97.7%)	223(96.5%)	0.406
Yes	06(2.3%)	08(3.5%)	
Port site infection			
No	206(76.6%)	151(65.3%)	0.006
Yes	63(23.4%)	80(34.7%)	
Significant pain			
No	127(47.2%)	125(54.1%)	0.124
Yes	142(52.8%)	106(45.9%)	

DISCUSSION

Insertion of drain was not associated with any additional benefit in our study in terms of any post-operative complications. Few procedures though directly not related to surgery but have an impact on overall outcome of the procedure. For long it has been considered that insertion of drain is necessary to prevent certain complications after the surgery. Minimally invasive surgery had been no exception to it and surgeons using laparoscopic methods have been practicing same conventional methods after the surgeries including insertion of drain. Does these practices really benefit the patient has been a question for researchers and surgeons. We in our study tried to obtain data regarding the complications after laparoscopic cholecystectomy with drainage vs no drainage.

A randomized controlled trial performed by Park et al. in 2015 to weight the benefits of putting drain after abdominal surgery. They came up with the findings that abscess formation, collection of sub hepatic fluid and empyema did not occur with any statistically significant difference in any of the two groups.[15] Our results supported the findings generated by Park et al. rather they were other way round and patients who were not put on drain at the end of surgery did better in terms of bleeding and port site infection as compared to those who were put on drain.

Yang *et al.*[16] in 2020 published a systematic review and meta-analysis and concluded that there was no conclusive evidence to support the use of routine drainage after laparoscopic cholecystectomy in non-complicated benign gallbladder disease. They complied data from a large number of studies and then came up with the results not establishing the role of complications in prevention of complications. We came up with similar findings in our data analysis as use of drainage was associated with more complications.

Benefit of drain insertion after laparoscopic cholecystectomy for acute cholecystitis was evaluated in a prospective multicenter RCT by Kim *et al.* in 2015. It was concluded that routine insertion of drain after the surgery had no added benefit rather it has negative impact on post-operative pain reported by the patients.[17] In our analysis post-operative pain was not found with a statistically significant difference in both the groups but port site infection and bleeding was found more in patients who had drain insertion after the surgery. Drain insertion somehow turned out to be counter therapeutic in our study participants.

Valappil *et al.* in 2020 conducted a randomized controlled trial to analyze the importance of drain in laparoscopic cholecystectomy in acute calculous cholecystitis.[18] They came up with the findings that routine use of drain should be discouraged in these surgeries as it increase the chances of having pain and provide no added benefit in terms of reducing post-operative complications. Our results were similar and routine use of drain after cholecystectomy emerged counter therapeutic in our study as patients which had drain in place had more chances of bleeding and port site infection as compared to those in which there was no drain in place. Other complications like pain and bile leakage occurred independent of drain use or no use.

LIMITATION OF STUDY

Patients were not followed up for long therefore role of drain insertion in long term outcome after the surgery could not be commented upon. Individual factors or surgery related factors may be different in all patients and can be related to complications therefore role of putting drain and association with various complications cannot be ascertained with this study design.

CONCLUSION

Routine use of drain after cholecystectomy emerged counter therapeutic in our study as patients which had drain in place had more chances of bleeding and port site infection as compared to those in which there was no drain in place. Other complications like pain and bile leakage occurred independent of drain use or no use.

Conflict of Interest: None.

Funding Source: None.

Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

TK & KS: Data acquisition, data analysis, critical review, approval of the final version to be published.

FUN & AJK: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

MHK & REKA: Conception, data acquisition, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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