Original Article

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Do We Need Sub-Hepatic Drainage After Elective Laparoscopic Cholecystectomy?

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Author`s Contribution

[1,5]Substantial contributions to the conception or design of the work; or the acquisition, [3,4]Active participation in active methodology, [3]analysis, or interpretation of data for the work, [2,6]Drafting the work or revising it critically for important intellectual content

Funding Source: None
Conflict of Interest: None

Received: May 12, 2024
Accepted: Nov 19, 2024

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ABSTRACT

Objectives: To analyze the advantages and disadvantages of placing a sub-hepatic drain after elective minimally invasive gallbladder removal surgery, identifying specific patient symptoms and pathological findings where this procedure is recommended.

Methodology: This randomized controlled study was conducted at PAC Hospital Kamra and PAF Hospital Islamabad, from October 2020 to September 2022. Through non-probability consecutive sampling 100 participants undergoing elective LC were included in the study. Recruited participants were randomly divided in to two groups. Group A with abdominal drains and Group B Without abdominal drain. After surgery, every patient has been closely monitored in order to estimate factors like mean operating time, mean hospital stay, nausea vomiting and postoperative pain. Data has been summarized and analyzed through SPSS version 21.

Results: The average age of the individuals in group A and B was 39.92±14.03 and 40.24±12.91 years, respectively. Most of the participants with the abdominal drains were in the age group 18-30 years. The average surgery time in both the study groups was 103.54±32.29 and 90.76±26.9 minutes respectively, indicating a highly significant difference with a p value of <0.0001. For group A, a notable 30% of the participants had to deal with post-operative nausea and vomiting (PONV). By comparison, a mere 12% of the individuals in group B encountered similar discomfort with statistically significant p value of 0.002. In group A, half of the participants reported experiencing pain after surgery, whereas in the other group, only 22% of the participants complained of post-operative pain. The difference was statistically significant, with a p-value of less than 0.0001. The mean hospitalization time for both study groups was 4.46±1.66 days (Group A) and 3.02±1.88 days (Group B), with a p value of <0.0001, indicating a highly significant difference.

Conclusion: In simple gallstone disease, a competent surgeon may safely perform LC without draining the gallbladder bed. Patients benefit greatly in terms of reduced postoperative pain, analgesia requirement, nausea and vomiting (PONV) and length of hospital stay. It may not be necessary to place a drain if the operating area is kept dry.

Keywords: Gallstone disease; Laparoscopic cholecystectomy; Subhepatic drain; post-operative outcome

Cite this article as: Khatoon A, Khan MN, Rana NA, Hameed FM, Shabbir S, Haq RN. Do We Need Sub-Hepatic Drainage After Elective Laparoscopic Cholecystectomy? Ann Pak Inst Med Sci. 2025; 20(4):765-768. doi. 10.48036/apims.v20i2.1249.

Introduction

Cholecystitis and gallstones are highly widespread global clinical disorders. Laparoscopic cholecystectomy (LC) is currently considered the most effective and widely accepted therapeutic procedure. This approach is cosmetically better with reduced postoperative pain and hospital stay, as well as quicker return to normal activities. The incidence of gallbladder disease is around 10-15% in the adults, with higher prevalence rates in certain regions due to lifestyle changes and genetic predispositions. [1,2]

Despite the advantages of LC, there is still a debate about the use of prophylactic drainage of gall bladder bed after surgery. After extensive research, Theodor Billroth concluded that preemptive peritoneal draining during and after gastrointestinal operations saved many lives. Drains are placed to manage biliary leakage, blood, or other intra-abdominal fluid collections, which might delay the recovery process. [3,4]However, recent data is not in the favor of routine placement of the drains following straightforward LC, as it suggests that it may not significantly reduce postoperative complications but can

lead to increased pain, infection risk, and longer hospital stay. [5,6]

Moreover, advancements in surgical procedures and enhanced postoperative care have prompted a reassessment of the necessity of prophylactic sub-hepatic drainage. Evidence suggests that in elective LC for asymptomatic gallstones and chronic cholecystitis, routine drain placement may not be warranted.[7] The choice of sub-hepatic drains use should be tailored according to the individual patient risk factors and per-operative findings, rather than the routine placement. Recent research continues to explore the balance between the advantage and disadvantages of sub-hepatic drain use, in order to optimize patient outcomes after laparoscopic cholecystectomy.[8]

The aim of this research is to identify the clinical and pathological circumstances under which drain insertion after LC is justified, weighing its potential benefits against the risks of increased morbidity and prolonged recovery times.

Methodology

After the ethical approval from institutional review board, this randomized controlled study was conducted at PAC Hospital Kamra and PAF Hospital Islamabad, from October 2020 to September 2022. Through non-probability consecutive sampling 100 participants undergoing elective LC between ages 18- 65 years, of both genders, diagnosed with chronic calculus cholecystitis were included in the present study. Participants who had obstructive jaundice, intraoperative bleeding, intraoperative cholangiogram, conversion to open surgery, intraoperative biliary tract damage, or choledocholithiasis were not included in the present study. Participants were recruited and randomly assigned to two study groups: Group A, who had abdominal drains, and Group B, who did not have abdominal drains. The data was gathered via in-depth interviews, serial physical examinations, and reviews of pertinent medical records. For this purpose, we used a questionnaire that has already been developed and field-tested. Before any data was collected, informed permission was obtained from each patient. After surgery, every patient has been closely monitored.

Summaries of data have been created for calculating different characteristics, such as the average surgical time and hospital stay for each group and the percentage of patients reporting pain or discomfort 24hours after the surgery. For the purpose of data analysis, SPSS version 21 was utilized. The quantitative variables were represented as the mean plus or minus, whereas the continuous variables were portrayed as frequency and percentage. A P value less than or equal to 0.05 was deemed to be statistically significant.

Results

A total of 100 participants were included in the present study and randomly divided into two groups: Group A- with abdominal drains and Group B- without abdominal drains. Table I shows the age interval-wise distribution of the participants in both the study groups. Mean age of the participants in group A and B was 39.92±14.03 and 40.24±12.91 years respectively. In both the study groups, majority of the participants were in the age interval of 18-30 years. Figure 1 shows distribution of age groups with regard to frequency of abdominal drain insertion in the study participants.

Table I: Age-Wise distribution of participants in the study groups.

Age (years)	Group A (n=50)	Group B (n=50)	N (%)
18-30	17	15	32 (32%)
31-40	10	10	20 (20%)
41-50	9	12	21 (21%)
51-65	14	13	27 (27%)
Mean ± S.D	39.92±14.03	40.24±12.91	P Value= 0.654

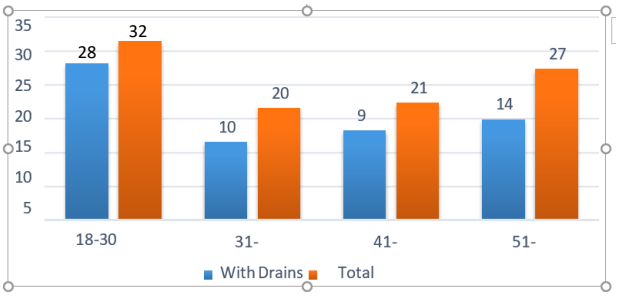

Figure I. Frequency of Drain insertion according to age interval.

Most of the participants with the abdominal drains were in the age group 18-30 years. Figure 2 shows the gender distribution of the participants in both the study groups. Group A consists of 15 (30%) male and 35 (70%) female participants, while Group B consists of 25 (50%) males and 25 females (50%). In Table II, the clinical parameters of the individuals who participated in both study groups are presented. In group A, the average duration of surgery was 103.54±32.29 minutes, but in the group B, it was 90.76±26.9 minutes indicating a highly significant difference with a p value of <0.0001. The

duration of the operation for the majority of the participants in both groups ranges between 70-110 minutes. In group A, 30% of the individuals suffered post-operative nausea and vomiting, but in group B, only 12% of the participants experienced PONV, with a p value of 0.002 indicating that the difference was statistically significant. In group A, 50% of the participants experienced post-operative pain, while only 22% of patients in group B complained the same, with a significant p value of <0.0001. In group A, 16% patients developed postoperative sub-hepatic collection after 24h in comparison to 20% in group B. This was a small difference and statically insignificant with a p value of 0.83. Mean hospital stay in both the study groups was 4.46±1.66 and 3.02±1.88 days respectively with a significant p value of <0.0001.

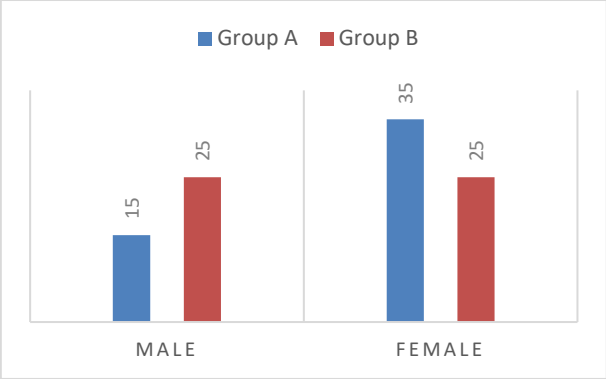

Figure II: Gender distribution in the study groups.

Table II: Post-Operative outcome of the participants in both study groups.

Clinical	Group A	Group B	P Value
Surgery Time	103.54±32.29	90.76±26.9	
<70mins	8 (16%)	13 (26%)	
70-110mins	26 (52%)	26 (52%)	<0.0001
>110mins	16 (32%)	11 (22%)	
Post-operative Nausea and Vomiting			
Yes	15 (30%)	6 (12%)	0.002
No	35 (70%)	44 (88%)	
Post-Operative Pain			
Yes	25 (50%)	11 (22%)	<0.0001
No	25 (50%)	39 (78%)	
Post-operative Sub-Hepatic collection after			
Yes	8 (16%)	10 (20%)	0.083
No	42 (84%)	40 (80%)	
Hospital Stay	4.46±1.66	3.02±1.88	
<3 days	5 (10%)	25 (50%)	
3-5 days	35 (70%)	20 (40%)	<0.0001
>5 days	10 (20%)	5 (10%)	

Discussion

Cholelithiasis is a very common pathological condition that poses significant clinical challenges due to the potential severity of its complications. The traditional approach for treating gallbladder diseases has been through open cholecystectomy, which was first performed by Carel Johann Langenbuch in 1882.[9]

Contemporary research consistently confirms that laparoscopic cholecystectomy (LC) is the most reliable method for managing gallstones. This is because LC offers several benefits compared to open cholecystectomy, including decreased postoperative pain, faster recovery periods, and enhanced cosmetic outcomes.[10]

Prophylactic sub-hepatic drainage is done in LC to reduce postoperative morbidity by preventing complications such as intra-abdominal collections and detecting bile leaks.[11] Our study found that the majority (52%) of gall stone disease occurred in individuals in their second, third, and fourth decades of life. The highest incidence was observed in those aged 18 to 30 (32%), followed by those aged 30 to 40 (20%). In contrast to other studies, which suggest that the highest occurrence of cholelithiasis happens between the ages of 40 and 50.[12]

In our analysis, females had a higher prevalence of gallstone disease compared to males, with a ratio of 1:1.5 (60% female and 40% male). This aligns with recent findings by Besra et al., who reported similar gender distributions in gallstone disease.[13] Group A had a substantially longer mean surgical time of 103.54±32.29 minutes compared to Group B, which had a mean duration of 90.76±26.9 minutes. The distinction between the two groups was statistically significant, as indicated by a p-value of less than 0.0001. This is consistent with observations by recent studies, where operation times ranged from 90 to 110 minutes.[14]

Group A exhibited a significantly greater incidence of postoperative nausea and vomiting (PONV) at 30%, compared to Group B at 12%. The observed difference was statistically significant, as evidenced by a p-value of 0.002. The disparity emphasizes the influence of drainage on surgical results, as evidenced by current study on the subject.[11,15] Group A exhibited a considerably higher level of postoperative pain, as measured 24 hours after surgery, compared to Group B. The difference in pain levels between the two groups was statistically significant, with a p-value of less than 0.0001. These results suggest that patients in Group A had a higher level of discomfort after

the surgery, which is consistent with previous studies that have examined pain outcomes after laparoscopic operations.[16]

There was no significant difference in developing postoperative sub-hepatic collection between the two groups. In Group A, the incidence was 16%, whereas in Group B, it was 20% (P=0.83). Participants in Group A had a longer hospital stay following surgery compared to those in Group B. The average duration of hospitalization following surgery was 4 days for Group A and 3 days for Group B. Guruswamy and Bansal et al.[14.17] both found quite similar observations.

Conclusion

In simple gallstone disease, a competent surgeon may safely perform LC without draining the gallbladder bed. Patients benefit greatly in terms of reduced postoperative pain, analgesia requirement, nausea and vomiting (PONV) and length of hospital stay. We conclude that when a dry operative field is achieved at the conclusion of the surgery, it is permissible to forego drain insertion.

References

1. Pucher PH, Brunt LM, Davies N, Linsk A, Munshi A, Rodriguez HA, Fingerhut AS, Fanelli RD, Asbun H, Aggarwal R. Outcome trends and safety measures after 30 years of laparoscopic cholecystectomy: a systematic review and pooled data analysis. Surg Endosc. 2018;32(6):2175-2183. https://doi.org/10.1007/s00464-017-5974-2
2. Metwally MF, El-Sawaf MI, Arafa MA, Ismail AK. Drainage versus no drainage after laparoscopic cholecystectomy: A prospective randomized study. Int J Surg Sci. 2024;8(1):27-33. https://doi.org/10.33545/surgery.2024.v8.i1a.1045
3. 3Kitano S, Matsumoto T, Aramaki M, Kawano K. Lparoscopic cholecystectomy for acute cholecystitis. J Hepatobiliary Pancreat Surg. 2002;9(5):534-537. https://doi.org/10.1007/s005340200069
4. Petrowsky H, Demartines N, Rousson V, Clavien PA. Evidence-based value of prophylactic drainage in gastrointestinal surgery: a systematic review and meta-analysis. Ann Surg. 2004;240:1074-1085. https://doi.org/10.1097/01.sla.0000146149.17411.c5
5. Gupta V, Jain G. Safe laparoscopic cholecystectomy: Adoption of universal culture of safety in cholecystectomy. World J Gastrointest Surg. 2019;11:62-84. https://doi.org/10.4240/wjgs.v11.i2.62
6. Yang J, Liu Y, Yan P, Tian H, Jing W, Si M, Yang K, Guo T. Comparison of laparoscopic cholecystectomy with and without abdominal drainage in patients with non-complicated benign gallbladder disease: A protocol for systematic review and meta analysis. Medicine. 2020 May 15;99(20):e20070. https://doi.org/10.1097/MD.0000000000020070
7. Sruthi C, Sattar A, Chennupati TP, Shahana S. PROPHYLACTIC DRAINAGE IN CHOLECYSTECTOMY IN UNCOMPLICATED ACUTE CHOLECYSTITIS. European Journal of Cardiovascular Medicine. 2023 Jan 1;13(1).
8. Calini G, Brollo PP, Quattrin R, Bresadola V. Predictive factors for drain placement after laparoscopic cholecystectomy. Front Surg. 2022 Feb 2;8:786158. https://doi.org/10.3389/fsurg.2021.786158
9. Lunevicius R. Review of the literature on partial resections of the gallbladder, 1898-2022: The outline of the conception of subtotal cholecystectomy and a suggestion to use the terms 'subtotal open-tract cholecystectomy' and 'subtotal closed-tract cholecystectomy'. J Clin Med. 2023;12(3):1230. https://doi.org/10.3390/jcm12031230
10. Zhu H, Liu D, Zhou D, Wu J, Yu Y, Jin Y, et al. Effectiveness of no drainage after elective day-case laparoscopic cholecystectomy, even with intraoperative gallbladder perforation: a randomized controlled trial. Langenbecks Arch Surg. 2023;408:112. https://doi.org/10.1007/s00423-023-02846-z
11. Abdulhassan BA. Tube drainage versus without drain laparoscopic cholecystectomy. Ann Trop Med Public Health. 2021;108. https://doi.org/10.36295/ASRO.2021.24515
12. Song Y, Ma Y, Xie FC, Jin C, Yang XB, Yang X, et al. Age, gender, geographic and clinical differences for gallstones in China: a nationwide study. Ann Transl Med. 2022 Jul;10(13):735. https://doi.org/10.21037/atm-21-6186
13. Besra RC, Toppo S, Kerketta MD, Bodra P, Keshari US, Pavithran B, et al. A study on the prevalence of gallbladder disease and its associated factors in a tertiary hospital of Eastern India. Int J Acad Med Pharm. 2024;6(2):782-788.
14. KS, Samraj K, Mullerat P, Davidson BR. Routine abdominal drainage for uncomplicated laparoscopic cholecystectomy. Cochrane Database Syst Rev. 2007; 4: CD006004. https://doi.org/10.1002/14651858.CD006004.pub2
15. Dharamdev D, Mascarenhas RM, Bhandary A. Comparative study of laparoscopic cholecystectomy with and without drains. Int Surg J. 2021 Sep;8(9):2633-2636. https://doi.org/10.18203/2349-2902.isj20213588
16. Tarwey P, Murari K, Marandi P. Drain versus 'no drain' in elective non-complicated laparoscopic cholecystectomy: An observational study. J Med Dent Sci Res. 2021;8(6):13-15.
17. Bansal PK. To compare the differences between laparoscopic cholecystectomies performed with and without drains. J Adv Med Dent Sci Res. 2019;7(1):229-233.