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Original Article

Drain Placement After Laparoscopic Cholecystectomy: A Cross-Sectional Study

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ABSTRACT

Objective: In laparoscopic cholecystectomy, Drain placement is decreasing morbidity, Although Drain is not required in all cases.

Study Design: Cross-sectional study

Place and Duration of Study: General Surgical Department of CMH, Rawalpindi, Pakistan from Mar 2017 to Sep 2017.

Methodology: A total of 100 male & female participants, aged 20-40 years, who underwent laparoscopic cholecystectomy with gallstones ≤ 6 in numbers (size < 3cm) on ultrasound, duration of complaint > 6 months, and ASA grade I and II were included. All the patients were operated under general anesthesia by a consultant surgeon with a minimum of 3 years of post-fellowship experience and well-versed in laparoscopic cholecystectomy. Abdominal ultrasonography of all patients was performed on the first postoperative day with the goal to detect any fluid collection. The drain was placed if the volume of subhepatic fluid collection was ≥ 60 mL (large volume of subhepatic fluid) detected at the ultrasonographic examination. Data regarding patients needing drain was noted by the researcher himself and recorded on especially designed proforma.

Results: Out of 165 participants, 76(46%) were males and 89(54%) were females. Of the total participants, 29 patients needed drain after laparoscopic cholecystectomy. The mean age of participants was 31.5±4.85 years, the mean duration of complaint was 9.3±2.35 months, the mean volume of subhepatic fluid was 38.040±17.12 ml and the mean weight of the patient was 77.780±11.44 kg.

Conclusion: Obese individuals and subjects with large volumes of subhepatic fluid during laparoscopic cholecystectomy may need drainage.

Keywords: Drain placement, Laparoscopy, Obesity, Prophylaxis, Surgery.

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INTRODUCTION

laparoscopic cholecystectomy (LC) is the second most common operation in general surgery after appendectomy in gastrointestinal surgery. In open cholecystectomy, multiple studies showed that putting drains increases morbidity most of the time without providing any extra advantage to the individual.[1] Nowadays, LC is the procedure of choice for both planned and urgent cholecystectomy.[2] Putting drains post LC is possibly reasonable as multiple biliary injury cases were reported and bile leakage is early notified.

Drains in LC avoid bile and blood accumulation which may require subsequent management.[3] The drain also helps in removing carbon dioxide from the abdominal cavity that was insufflated during the procedure and avoiding shoulder pain. Gases in the abdominal cavity cause irritation of the diaphragm as well as gastrointestinal symptoms i.e., nausea and vomiting which are markedly reduced due to drain.[4] Surface tension between abdominal walls and viscera is also reduced.[4] Putting drains has a therapeutic effect as liver dragging inside the abdominal cavity results in irritation of the diaphragm causing shoulder tip pain as well as nausea and vomiting. Sometimes wound infection and long hospital stay is noted with drain. Several medical researchers concluded that the rate of infection and reoperation were almost the same in both drains and without drains groups.[5]

With the passage of time due to advancements in technique and surgeons' experience drain placement was reduced and different trials also supported this approach in both open and LC procedures. A study found that drains were placed in fifty-one percent after laparoscopic cholecystectomy.[6] With 80% power of study using 5% absolute precision and a frequency of drain placement as 51%.[6] after laparoscopic cholecystectomy, the calculated sample size was 165. There is a paucity of data on this topic in our local

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population. Routine drainage after laparoscopic cholecystectomy is still debatable.[7] Therefore, the current study is planned to determine the frequency of patients needing drain after laparoscopic cholecystectomy.

OBJECTIVES

In laparoscopic cholecystectomy Putting Drain is decreasing morbidity.

Drain is not required in all cases.

METHODOLOGY

A cross-sectional study was conducted at the General Surgical Department of CMH, Rawalpindi from 20th March 2017 to 20th September 2017.

Inclusion Criteria: A total of 165 male & female participants, aged 20-40 years, who underwent laparoscopic cholecystectomy with gallstones ≤ 6 in numbers (size less than 3cm) on ultrasonography, duration of complaining > six months and American Society of Anesthesiology grade I and II were included.

Exclusion Criteria: Patients with a history of upper abdominal surgery or pancreatitis were excluded. In addition, subjects with conversion to open cholecystectomy were also excluded.

In this study, patients were included as per inclusion criteria. The ethical committee and research department of CMH, Rawalpindi (230) allowed this study. After giving detailed explanations to patients regarding the benefits of the research work written, informed consent was taken. Every patient was operated on under general anesthesia by a surgical specialist with at least three years of post-fellowship expertise and sound knowledge of LC. During induction of anesthesia one gm of ceftriaxone was given to every patient. Four-port method of LC was performed in all patients. Two ten mm ports (one infraumbilical for the camera and one ten mm in epigastric port) while two other five mm ports i.e. one in the midclavicular line in the subcostal area, while other along the anterior axillary line. Pneumoperitoneum was created by both veress needle and open trocar (Hasson's) technique and abdominal pressure was kept between twelve to fifteen mmHg. Cystic duct and artery were ligated with the help of metallic clips. Electrocautery and harmonic scalpel were used variably for achieving good hemostasis and removing dense adhesions. The gallbladder was removed via a bag created from a latex surgical glove. Both ten mm ports were approximated with absorbable suture vicryl 1. Patients were given a standard deep vein thrombosis prophylaxis. On the first postoperative day, an ultrasound abdomen was done on all patients to look for fluid collection. The drain was placed if the volume of subhepatic fluid collection was≥ 60 mL and was detected at the ultrasonographic examination. Data regarding patients needing drain was noted by the researcher himself and recorded on proforma which was specifically designed. Data was examined with the statistical study program (IBM-SPSS.V.22). Frequency and percentage were calculated for qualitative variables like gender and patients needing drain. Mean±SD was presented for quantitative variables like age, duration of complaint, the volume of subhepatic fluid, and weight. Assessments were done for effect modifiers age, gender, weight, duration of complaint and volume of subhepatic fluid. Post-stratification chi-square test was applied,The p value of ≤0.05 was considered statistically significant.

RESULTS

Out of 165 participants, 76(46%) were males and 89(54%) were females. Of the total participants, 29 patients needed drain after laparoscopic cholecystectomy. The mean age of participants was 31.5±4.85 years, the mean duration of complaint was 9.3±2.35 months, the mean volume of subhepatic fluid was 38.040±17.12 ml and the mean weight of the patient was 77.780±11.44 kg.

There was a significant association (p<0.05) between weight>75 kg and volume of subhepatic fluid≥60ml while age, gender and duration of complaint have an insignificant association (p>0.05) with drainage. (Table I)

Table-I: Association of different variables with drain

		Patient needing Drain		*p*-value
		Yes	No	
Age group (in years)	20-30	18(10.9%)	72(43.6%)	0.370
	31-40	11(6.6%)	64(38.7%)	
Gender	Male	17(10.3%)	59(35.7%)	0.135
	Female	12(7.27%)	77(46.67%)	
Duration of complain (months)	7-12	15(9.1%)	68(41.2%)	0.866
	>12	14(8.5%)	68(41.2%)	
Weight (Kg)	≤75	0(0%)	66(40%)	0.000
	>75	29(17.6%)	70(42.4%)	
Volume of subhepatic fluid (ml)	<60	0(0%)	135(81.8%)	0.000
	≥60	29(17.6%)	1(0.6%)	

DISCUSSION

In 1882, a German surgeon Langenbuch performed the first cholecystectomy which was the

"ideal technique" for symptomatic cholelithiasis.[8,9] Many following studies support this narrative while the use of drains in cholecystectomy remains debatable.[10,11] Though there is no clear scientific evidence still in abdominal surgeries routine use of drains is a traditional practice. To avoid post-operative problems such as bile leaks and bleeding which is early detected due to drain and this highlights its importance. Several medical studies claim that a closed drainage system after an abdominal operation such as cholecystectomy.[12] colorectal surgeries[13], and pancreatic surgeries.[14] are not useful and drains frequent usage increases the chances of intra-abdominal and wound site infections and therefore hospital stay is prolonged with deranged lungs function.[12,15] LC is the procedure of choice for cholelithiasis as this operative procedure results in quick healing of the wound, low wound site and intra-abdominal infection, and short hospital stay. However, due to pneumoperitoneum and laparoscopic surgeries post-operative shoulder pain, vomiting, back pain, and nausea are observed. Few studies show that complaints due to pneumoperitoneum are high in the high-pressure group as compared to the normal-pressure group.[16] Drain placement after cholecystectomy helps to avoid peritonitis. Drain placement is a more useful option in the presence of an aberrant biliary channel, suspicion of clipping the biliary tract, or difficult dissection which may cause bleeding. In 1962, Myers explained "drain fever syndrome" post-cholecystectomy.[15] which means that fever and pain in the right upper quadrant develop when the drain is placed for more the forty-eight hours. Within one to three days' pain and fever usually vanish spontaneously and this was noted in 23 percent with the drain group and 4 percent without the drain group.[17] The said difference can be presented as 1: drain presence causes foreign body reaction[18], 2: the drain forms a communication between the peritoneal cavity and skin [19], and 3: drain presence prevents coughing due to discomfort. Also, Cruse and Foord recognized that in drain groups wound site infection was 5 times more than in those without drains.[20] In this study, eighteen out of a hundred cases who underwent LC, fluid collection of more than or equal to 60 ml in the Morrison pouch was found by hepatobiliary ultrasound on the first postoperative day. Cruse and Foord examined 130 cases of conventional cholecystectomy and noted on the first postoperative day subhepatic fluid collection in 25.5% of cases.[21] In our study, we observed a mean collection of serosanguinous fluid which was 38.040±17.12 mL. Postcholecystectomy subhepatic fluid collections as a whole are usually reabsorbed whether a drain was used or not.[22] Thiebe and Eggert described that the total number of abdominal collections was higher in drained patients (44%) as compared with non-drained patients (4.1%).[23] The authors also recommended that the placement of the drain aggravates leakage from superficial biliary ductules damaged by dissection and claimed that without drainage it would quickly be walled off. Moreover, the drain may also give a false sense of security as actually drain neither prevent nor treat postoperative collection. The main objective of this study, as that postoperative ultrasound-guided aspiration was possible from the subhepatic area only when the drain was in place.

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CONCLUSION

The frequency of drainage after laparoscopic cholecystectomy is low. Obese individuals and subjects with large volumes of subhepatic fluid during laparoscopic cholecystectomy may need drainage.

Conflict of Interest: None.

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Authors' Contribution

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

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

MRK: & MWB: Data acquisition, data analysis, approval of the final version to be published.

TA: & MI: Critical review, concept, 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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