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ORIGINAL ARTICLE

Comparison of Outcome between Drain and No Drain after Elective Laparoscopic Cholecystectomy

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ABSTRACT

Background: Laparoscopic cholecystectomy (LC) has been established as the gold standard treatment for gallstone disease. However, there is a debate regarding the post-operative placement of a drain in LC.
Aim: To compare the outcome of patients undergoing placement of drain versus patients without a drain following elective LC.
Methodology: A quasi-experimental study was conducted at Mufti Mehmood Memorial Teaching Hospital, Dera Ismail Khan from September 2017 till August 2019. A total of 136 patients of cholelithiasis were randomly allocated to two groups: A (drain placed) and B (no drain placed). Clinical variables such as age, gender, BMI, duration of surgery, duration of hospital stay, vomiting, abdominal fluid collection and wound infection were recorded for all patients in two groups.
Results: The mean age of the patients was 38.6±0.2 years. The mean time of surgery in group A was 44.2±10.3 minutes compared to 45.4±10.3 minutes in group B. The mean time of hospital stay in patients of group A was 2.3±1.0 days compared to 2.3±0.9 days in group B. After surgery, 16(23.5%) patients in group A experienced vomiting compared to 22(32.4%) in group B. Seven (10.3%) patients in group A had abdominal fluid collection compared to 12(17.6%) in group B. Moreover, eight (11.8%) patients in group A developed wound infection compared to 11(16.2%) in group B.
Conclusion: There is no need to place a subhepatic drain routinely after laparoscopic cholecystectomy in uncomplicated cases.
Keywords: Laparoscopic cholecystectomy; cholelithiasis; wound infection; vomiting; fluid collection; drain.

INTRODUCTION

Gallstone disease has been reported to be the most common biliary tract illness globally[1]. A total of 20 million have gallstone disease in the US alone[2]. Nasir et al reported a gallstone prevalence of 60% among 150 Pakistani patients[3]. Laparoscopic cholecystectomy (LC) is considered the gold standard treatment for removing gallstone removal.Innovations in the LC procedure continue to improve the overall success of the procedure[4,5]. Laparoscopic surgery is associated with minor incisions, reduced hospitalization times, reduced postoperative discomfort, rapid recovery and reduced infection susceptibility[6]. In spite of developments in the LC, the procedure is still associated with multiple complications[7.8]. Among these, gall bladder (GB) perforation associated with leakage of bile and stones into the peritoneal cavity is quite common[9].

Recommendations regarding the use of drainage following LC vary. European and Asian guidelines do not recommend the use of a drain following an elective LC[10,11]. However, there is no consensus regarding using drains in acute, emergency situations[12]. Therefore, the decision to use a drain remains the decision based on the surgeon's assessment of the clinical situation.

The presence of a drain in an infected abdominal region may improve prognosis[10]. Nowadays, the laparoscopic surgeons vary in their practice from routine drainage after LC, drainage in selected cases to no drain at all.

The present study aimed to compare outcome of using a drain to no drain after performing LC in cholelithiasis in our set up.

METHODOLOGY

A quasi-experimental study was conducted in the Department of Surgery at Mufti Mehmood Memorial Teaching Hospital, Dera Ismail Khan after IRB permission from September 2017 till August 2019.A sample of 136 patients with 68 in each group was estimated to be adequate using a18.7% proportion of SSI after LC with drain and 5% after LC without a drain with a 95% confidence level and 80% power. All the patients aged 18-60 years with cholelithiasis were included in the study. All the patients were admitted in surgical ward from surgical outpatient department. All the patients underwent fitness check by anesthetist prior to surgery. The patients with acute cholecystitis, choledocholithiasis, acute pancreatitis, previous upper abdominal surgery, uremia (serum urea > 65 mg/dl), obesity (BMI of30 kg/m^{2}or more) and diabetes mellitus for more than three years were excluded from the study. The purpose and complications of the procedure were explained to the patients and informed, written consent was taken. The patients were randomly assigned to two groups using lottery method. Group A included patients in whom a post-operative drain was placed. No drain was placed in Group B patients. The surgical procedure was performed by an experienced surgeon with more than five years of experience. All the cases were operated via standard four port technique (two 10mm ports and two 5mm ports).

The antibiotic prophylaxis in the form of ceftriaxone was given preoperatively and all the operations were performed under general anesthesia. In each case, complete hemostasis was done. The duration of operation and other procedural details were noted. The intravenous ceftriaxone was continued postoperatively twice a day during hospital admission. In patients with drain, 16 Fr drain was put in through lateral most 5 mm port. All the patients underwent postoperative ultrasound abdomen on first postoperative day to check for subhepatic fluid collection. The drain was removed when the discharge was minimal (about 20 ml or less) in last 24 hours. The record of vomiting of patients was kept. The patients were discharged on first to fourth postoperative day. The patients were asked to come back for followup on 7 th postoperative day to detect any complications such as skin and soft tissue infection (SSI), vomiting andabdominal fluid collection (ultrasound abdomen done on followup visit). All data was entered and analyzed using SPSS 21. Frequencies and percentages were described for categorical variables such as age groups, gender, BMI, duration of surgery, duration of hospital stay, vomiting, abdominal fluid collection and wound infection. In order to compare any difference in the frequency distribution of the categorical variables between the two groups, chi-square test was applied. A p value of less than 0.05 was considered to be significant. Mean and standard deviation were described for quantitative variables, such as age and mean hospital stay.

RESULTS

A total of 136 patients were included in this study, with 68 patients each in Groups A and B. The overall mean age of the patients was

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38.8±10.2 years. The mean age of patients in Group A was 38.8±9.3 years while that for Group B patients was 38.3±11.3 years. In Group A, there were 36 (52.9%) males and 32 (47.1%) females, while there were 38 (55.9%) male and 30(44.1%) female patients in Group B. The overall BMI of all the patients was 25±2.3 kg/m^2. The mean BMI for Group A was 25±2.4 kg/m^2, while that for Group B was 25±2.1 kg/m^2. The mean duration of surgery in group A was 44.2±10.3 minutes compared to 45.4±10.3 minutes in group B. However, the mean hospital stay of patients in group A was 2.3±1 days compared to 2.3±0.9 days in patients of group B. In postoperative complications, vomiting was recorded in 38(27.9%) patients, abdominal fluid collection in 19(14%) and wound infection in 19(14%) patients, respectively. In comparative analysis, 16(23.5%) patients in group A had vomiting compared to 22(32.4%) in group B. Seven (10.3%) patients in group A had abdominal fluid collection compared to 12(17.6%) in group B and eight (11.8%) patients in group A had wound infection compared to 11(16.2%) in group B (Table 1).

Table 1: Characteristics for Groups A and B

		Group A (Drain)	Group B (No Drain)	p Value
Age Groups	22-30 Years	14 (20.6%)	20 (29.4%)	0.218
	31-40 Years	20 (29.4%)	23 (33.8%)	
	41-50 Years	26 (38.2%)	15 (22.1%)	
	51-60 Years	8 (11.8%)	10 (14.7%)	
Gender	Female	36 (52.9%)	38 (55.9%)	0.731
	Male	32 (47.1%)	30 (44.1%)	
BMI	20-23	26 (38.2%)	15 (22.1%)	0.116
	23.1-27	29 (42.6%)	38 (55.9%)	
	27.1-29	13 (19.1%)	15 (22.1%)	
Duration of Surgery (minutes)	30-45	45 (66.2%)	38 (55.9%)	0.218
	46-60	23 (33.8%)	30 (44.1%)	
Hospital Stay (days)	1-2	37 (54.4%)	39 (57.4%)	0.730
	More than 2	31 (45.6%)	29 (42.6%)	
Vomiting	Yes	16 (23.5%)	33 (32.4%)	0.252
	No	52 (76.5%)	46 (67.6%)	
Abdominal Fluid Collection	Yes	7 (10.3%)	12 (17.6%)	0.216
	No	61 (89.7%)	56 (82.4%)	
Wound Infection	Yes	8 (11.8%)	11 (16.2%)	0.458
	No	60 (88.2%)	57 (83.8%)	

DISCUSSION

LC is a gold standard for treating gallstone disease.[7]In comparison to conventional cholecystectomy, LC has reported better results in terms of significantly lesser pain. Any post-operative pain experienced by patients after LC has been shown to be effectively managed using analgesics[13].

Historically, the use of drains after surgical procedures including cholecystectomy has remained a conventional practice[14]. Surgical drains have been used prophylactically for drainage of any bile or blood following LC to prevent any intraabdominal collection. Moreover, drains allow any accumulated carbon dioxide to escape thereby preventing post-operative shoulder pain[15].

Mean hospital stay of patients in both the groups were almost similar in our study while the studies conducted by Gurusamy et al[16] and Satinsky et al[17] showed an increase in mean hospital stay in drain group. Rathi et al[18] also demonstrated much reduced hospital stay in patients without drain.

Gurusamy et al[16] found lesser rate of nausea in the drain group compared to no drain group. Satinsky et al[17] has shown no significant difference in post-operative sickness and vomiting between drain and nodrain groups and same is the case with our study.

The wound infection rate presented in our study is high as compared to several other studies such as ones by Gurusamy et al[16] and Rathi et al[18]. One reason for this is low threshold to diagnose a case as infected on 7th postoperative day that was treated by antibiotics. There was no statistically significant difference between two groups though. Gurusamy et al[16] reported lower wound infection rate in no drain group as compared to drain group while Rathi et al[18]showed comparable wound infection rate in both groups.

Myers in 1962 identified that if a drain is kept in place for more than 48 hours, the chance of gettingfever and right upper quadrant discomfort increases. He described this as 'Drain fever syndrome'.[19] He also reported that the fever spontaneously subsided in 1-3 days and occurred in 23% of patients with drains, as compared to 4% of patients without drains. This difference may be explained by the following reasons: the presence of a drain causes a foreign body reaction; the drain establishes a connection between the skin and the peritoneal cavity thereby providing access for the ingress of microflora;[20] and the discomfort related to the drains prevents people from coughing. Rathiet al[18] reported fever in few patients of both groups (6% - no drain group and 8 % - drain group), however the difference was not significant.In our study, drain was removed within 48 hours in all the casesand there was no instance of fever in our patients.All of our patients received ceftriaxone 1 gm and pain killer (with anti-inflammatory effects) injection twice a day during ward admission, while an antibiotic and an anti-inflammatory agent was prescribed in oral form on discharge too.

A limitation of this study was its quasi-experimental design.

CONCLUSION

The use of drain after LC was found to offer no significant advantage over not placing a drain. If surgeon feels there is some complication in surgery, then drain may be put in. Further multi-center randomized controlled trials should be conducted to establish more robust evidence.

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