

Original Research Article

Drain versus no drain in an uncomplicated elective laparoscopic cholecystectomy- an institutional study

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ABSTRACT

Background: Laparoscopic cholecystectomy (LC) is the gold standard for symptomatic gallstones. Post surgery to keep a subhepatic drain is an issue of debate. A randomised trial was designed to assess the outcome of drain in elective lap cholecystectomy.

Methods: A randomized control trial was done from January 2019 to June 2020 among 40 patients. They were randomised into group A: (n=20) in which subhepatic space was drained by an abdominal drain size 28F drain which was brought out through right anterior axillary port (even group) and group B: (n=20) in which there was no-drain at sub hepatic space (odd group). The end points of this study was to compare postoperative pain, fever, wound infection ,hospital stay between the two groups.

Results: Mean hospital stay among drain group was 3.95 ± 1.35 days as compared to 2.55 ± 0.60 days among no drain group and the difference was statistically significant (p value =0.001). 8 (40%) patients with drain had port side infection as compared to 1 (5%) patient among no drain group and the observed difference was statistically significant (p value =0.02). Post operative pain abdomen assessed using VAS, and found significant 12 after surgery. The young female patients were unhappy with the drain scar and 3 cases requested for need of plastic surgery corrections also.

Conclusions: The routine use of a drain in uncomplicated elective laparoscopic cholecystectomy has no benefit; in contrast, it is associated with longer hospital stay, so better to avoid the drain.

Keywords: Drain, Hospital stay, Infection, Lap cholecystectomy

INTRODUCTION

Gallstone disease, one of the commonest biliary tract disorders known since ages and at present is the major cause of hospitalisation. Langenbuch's open cholecystectomy remained the gold standard for symptomatic cholelithiasis for over a century but its preference in the surgical fraternity is slowly and steadily decreasing after the invent of minimally invasive surgery like mini-cholecystectomy and laparoscopic cholecystectomy (LC).¹

LC has revolutionised the treatment of gallstone disease, being the most remarkable surgical innovations of the 20th century. It has become gold standard for the treatment of cholelithiasis and it is the commonest laparoscopic operation performed worldwide.² Laparoscopic cholecystectomy provides a safe and effective treatment for patients with gallstones as it reduces postoperative pain with almost invisible scar, short hospital stay and earlier return to work which made it almost a day care surgery in the present times.³

The major biliary and vascular complications during laparoscopic cholecystectomy are life threatening, minor complications cause patient discomfort, back pain, collection at gall bladder fossa and prolongation of the hospital stay.⁴ The efficacy of drains to evacuate subhepatic collections may justify their use to prevent postoperative complications. Surgeons have routinely drained after laparoscopic cholecystectomy because of the fear of collection of bile or blood requiring further re laparoscopy or open exploration. Another reason for draining is to allow insuffled carbon dioxide during laparoscopy to escape via the drain site, thereby decreasing the shoulder pain. However, experimental studies showed that, when a drain is inserted in the peritoneal cavity that contains no fluids, it is quickly surrounded by omentum and completely occluded within 48 hours.⁵

On the other hand, usage of drain may increase postoperative pain at the drain site, infective complications and delay in the discharge from the hospital. It has shown higher incidence of wound infection, longer hospital stay and loss of cosmetic by the drain scar at right upper abdomen.⁶ In many instances prophylactic drains are useless or may even add to the morbidity or cost of a procedure.⁷ Therefore, controversy has surrounded this practice of inserting a drain in elective conventional cholecystectomies. However, the data related to effectiveness of drain use is still limited. This serves as a basis to undertake a present study to compare the effect of drain use on outcome of laparoscopic cholecystectomy.

A prospective study of 40 cases undergoing laparoscopic cholecystectomy with and without drainage was undertaken in order to study the incidence of post-operative morbidity in terms of complications like abdominal pain, drain site infections, port infections, fever, nausea and vomiting and need for additional analgesics in addition to prolonged hospital stay, for evaluation of merits and demerits of drainage over non-drainage techniques.

METHODS

The study was conducted in the department of general surgery laparoscopic division, GSL Medical College and General Hospital, Rajahmundry. A randomized control trial was done among 40 patients with gallbladder disease admitted for laparoscopic cholecystectomy during the period of January 2019-June 2020. The study was approved by the Institutional ethical committee

The surgery was done in a single unit by the trained certified laparoscopic surgeon. After obtaining written and informed consent, the patients were divided into two groups A and B on random basis. Group A: (n=20) sub hepatic space was drained by an abdominal drain size 24F drain which was brought out through anterior

axillary port (even group) group B: (n=20) no-drainage at sub hepatic space (odd group).

Inclusion criteria

All patients presenting with symptomatic cholelithiasis undergoing elective laparoscopic cholecystectomy. Cholelithiasis with normal common bile duct is included in study protocol.

Exclusion criteria

Cases with acute cholecystitis and with empyema gallbladder. Cases with complications like needing conversion to open surgery, ooze from liver bed requiring control by haemostat, accidental biliary tract injury. Cases with use of Intra operative cholangiography during surgery. Cases with history of previous upper abdominal surgery.

Operative procedure and outcome measures

After admission written informed consent was obtained in all the cases. Haemogram, liver-function tests, preoperative chest x-ray, ECG, ultrasonography (USG), MRCP was done in all cases. All patients were subjected to standard four port technique laparoscopic cholecystectomy under general anaesthesia. In group A sub-hepatic space was drained with 24F abdominal drain kept at anterior axillary port site. Drain was removed after 48/72 hours if the patient is stable without significant drain amount. In group B no drain was used.

Study variables

Demographic data of the patient including age, sex, clinical data consisting of presenting complaint and examination findings, investigations including USG abdomen and MRCP findings were recorded in a designed proforma. All the patients in both drain and no drain experimental and control group were evaluated for the following outcome measures postoperatively:

Abdominal pain (visual analogue scale), shoulder pain, drain collection at 24 hours, drain site infection, port infection, fever, duration of postoperative hospital stay, nausea, vomiting, need for additional analgesic other complications.

Postoperative pain was assessed at 0 day (within 12 hours), 1st day, 2nd day, after operation by using visual analogue scale. On day 0, all patients were administered analgesics after 1 hour of extubation than at then after 6 hours.

Some cases in group B discharged on the same day and we assessed the pain by making telephone calls and feedback. On day 1, 2 all the patients were given analgesics as required after assessing pain. The duration of discharge, and day of drain removal noted. The wound

infection was recorded by examination of wound daily for any discharge and/or redness. All patients were given respiratory physiotherapy, and were made ambulatory in the post-operative period as early as possible.

Statistical analysis

Tests applied for data analysis are mean, proportions, chi-square, t test and the results analysed using MS excel 2010, and SPSS 20 trial version.

RESULTS

Total 40 patients were included in the study and the age distribution of study participants given in Table 1.

Table 1: Age distribution of study population.

Age in years	Study participants	Percentage
20-29	8	20
30-39	7	17
40-49	10	25
50-59	9	23
>60	6	15

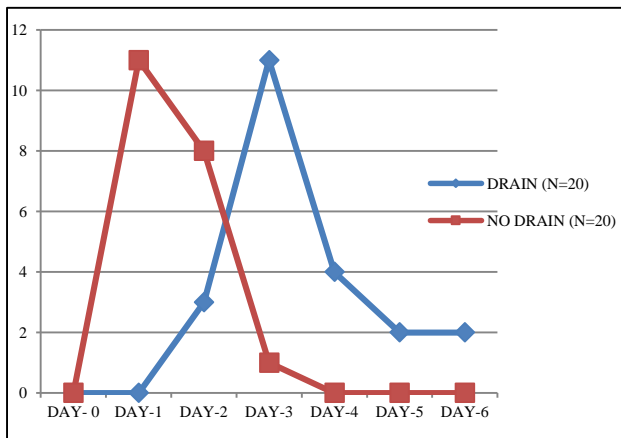


Figure 1: Discharge of the lap cholecystectomy cases both drain and no drain group.

Table 2: Demographic profile of study participants.

Study variables	Group A (with drain)	Group B (without drain)	P value
Age (mean±SD)	42.45±15.78 years	46.55±13.32 years	0.380
Gender distribution (female:male)	15 (75%): 5 (25%)	11 (55%): 9 (45%)	0.320

The mean age distribution of study subjects among drain group was 42.45±15.78 years as compared to no drain group was 46.55±13.32 years and the difference was not statistically significant. Majority of the study subjects in both drain group and no drain group were females i.e. 15 (75%) and 11 (55%) respectively and the difference was

not significant. Both age and gender distribution was comparable among both groups given in Table 2.

Table 3: Post operative complications of study participants.

Study variables	Group A (with drain)	Group B (without drain)	P value
Nausea and vomiting	13 (65%)	3(15%)	0.003
Infection at port site	8 (40%)	1 (5%)	0.02
Fever	8 (40%)	5(25%)	0.5
Abdominal pain (VAS score)	3.10±1.21	0.45+0.82	0.001
Shoulder pain	1.10±1.44	0.50+0.76	0.109
Durartion of hospital stay (mean±SD)	3.95±1.35 days	2.55±0.60 days	0.001

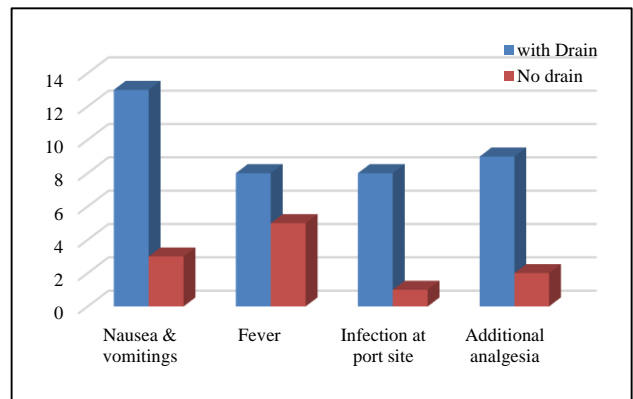


Figure 2: Comparison of post operative complications among drain and no drain group.

Mean hospital stay (in days) was significantly higher in case of no drain group compared to drain group (Table 3). On observing post operative complications (Figure 2) among both groups majority subjects i.e. was 13 (65%) among drain group had nausea and vomiting as compared to 3 (15%) subjects among no drain group, the observed difference was statistically significant (Table 3). Fever was also high among drain group patients. 8 (40%) patients with drain had Infection at port site is significantly higher among patients with drain as compared to patients with no drain (Table 3). Post-operative pain was assessed using VAS on day 0, 1 and 2 and the mean score for abdominal pain higher for drain group compared to without drain and the difference was significant 12 hours after surgery (Table 4). Mean score for shoulder pain among drain group was 1.10±1.44 as compared to 0.50±0.76 in no drain group (Table 2). Among the subjects with drain 8 (40%) had infection at drain site. Insertion of drain added to discomfort of the patients as total patients in drain group developed drain site infection and the majority of patients complained of pain on drain removal.

Table 4: VAS score of post operative pain abdomen.

Duration	Group A (with drain)	Group B (without drain)	P value
Day 0 (within 12 hours)	3.1±1.2	2.7±0.9	0.257
Day 1	2±0.8	1.4±0.7	0.0159
Day 2	1.3±0.9	0.45±0.82	0.003

The young female patients were unhappy with the drain scar and three patients requested for need of plastic surgery corrections of the scar.

DISCUSSION

Laparoscopic cholecystectomy is the gold standard for the treatment of cholelithiasis. LC offers faster recovery, day care surgery, shorter hospital stay, and better postoperative outcome and fewer complications.^{2,3}

Routine drainage was a part of cholecystectomy procedure for a long period of time. However, many studies have reported no practical benefit of inserting drains after laparoscopic cholecystectomy.⁵⁻⁷ But still there was no clear-cut practice regarding this. So, the present randomized controlled study was conducted on a total of 40 patients with two groups. There was statistical difference among no drain and drain groups in terms of duration of hospital stay, as it with was more in case of drain group (mean+SD =4.63±2.41) as compared to no drain group (mean+SD =8.63±4.06). Similar findings have also been reported by Nagpal et al, Ishikawa et al, where it is found that drain use prolongs the hospital stay.^{8,9} El-Labban et al also reported that hospital stay was longer in the drain group than in the group without drain and it is apparent that the use of drain delays hospital discharge.¹⁰

Present study reported a significant difference in rate of wound infection with drain use as compared to no drains because a greater number of patients in drain group 8 patients (40%) developed wound infection as compared to 1 patient in no drain group. Similar findings are also reported by Halim et al that due to more chances of infection it is advised not to place drain in laparoscopic cholecystectomy.¹¹ Gurusamy et al also concluded that wound infection tended to be higher in those with a drain.¹² Another major finding of the study was that incidence of nausea and vomiting was slightly higher among patients in the drain group as compared to patients in no drain group. The observed difference was statistically significant but Picchio et al stated that there was no statistically significant difference among the incidence of nausea and vomiting in the postoperative period with drain use and no use.¹³ Also in the present study there was no statistically significant difference among patients in any drain group and drain group in terms of fever during postoperative period. In the present study postoperative complication like haemorrhage was absent in all the cases in both drain group and no drain

group. On other hand Picchio et al reported two (1.9%) significant hemorrhagic events postoperatively.¹³

Our present study reveals that there was no significant effect of drain use on shoulder pain. These findings are supported by other studies conducted Gurusamy et al and Picchio et al which reported that there was no statistically significant difference in occurrence of shoulder tip pain with drain use.^{12,13} But in the case of patients where drain was inserted a total of 8 (40%) patients developed drain site infection and majority i.e. 20 (100%) of patients complained of pain on drain removal. Other studies by Rathi et al also reported that it was observed that routine placement of drain after laparoscopic cholecystectomy not only prolongs the postoperative hospital stay; it also leads to drain site pain/discomfort.¹⁴ Another major finding of the study was that there was a statistically significant (p value=0.001) difference in abdominal pain as assessed by visual analogue scale in both drain and no drain group after 12 hours after the surgery. May be during initial 12 hours after surgery the severity of pain was masked by effect of analgesics. To the addition patient had more pain during the drain removal and some needs extra analgesic. To the contrary of our findings Arslan et al reported that there was no difference in pain between groups in the 2nd, 8th, or 18th hour evaluation.¹⁵

CONCLUSION

So, it was concluded that there was no practical benefit of postoperative drain insertion in case of patients with uncomplicated, elective laparoscopic cholecystectomy. It offers no benefit in terms of postoperative abdominal pain reduction, shoulder pain reduction, nausea, vomiting and fever in the postoperative period. On the other hand, it prolongs the hospital stay can also increase the chances of wound infection. In addition, it adds to pain and discomfort on the drain site. So, drain use is not recommended as a routine practice in laparoscopic cholecystectomy.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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