



A COMPARATIVE STUDY BETWEEN ROUTINE INSERTIONS OF SUBHEPATIC DRAIN VERSUS NO DRAIN AFTER ELECTIVE LAPAROSCOPIC CHOLECYSTECTOMY

Subhadip Sarkar*

Assistant Professor, Department of Surgery, ESIC-PGIMSR, Joka, Kolkata.
*Corresponding Author

ABSTRACT

Introduction: Laparoscopic cholecystectomy is the mainstay of treatment in symptomatic cholelithiasis. Surgeons are still following the old habit of routine Subhepatic drainage following laparoscopic cholecystectomy (LC). However, routine drainage after LC is still a debatable issue. This study aims at evaluating the effects of Subhepatic drainage after standard laparoscopic cholecystectomy in terms of various post-operative parameters.

Materials & methods: The study was conducted at the department of General Surgery, ESIC-PGIMSR, Joka, Kolkata from January 2018 to March 2020. We selected 120 patients with symptomatic cholelithiasis & divided them into 2 groups; each having 60 patients, with drain & without drain respectively. Age & sex distribution of the patients, post-operative abdominal pain & right shoulder tip pain, post-operative wound infection, subhepatic collection (24 & 72 hrs after surgery) & post-surgical hospital stay were measured in both groups. Data were analyzed by appropriate statistical tests.

Results: We found the incidence of laparoscopic cholecystectomy was highest in the 5th decade & more common in women. The incidence of post-surgical abdominal pain & subhepatic collection were greater in the group of patients with drain in situ which was statistically significant also. Moreover, inserting drain showed increased incidence of post operative wound infection & hospital stay, though these were statistically insignificant. More patients in the non drain group showed post-operative right shoulder tip pain in comparison to the drain group but that was also statistically insignificant.

Conclusion: The decision of inserting drain should be taken judiciously on the basis of individual case scenario. The generalized approach of putting abdominal drain after every standard laparoscopic cholecystectomy is not at all beneficial.

KEYWORDS : cholelithiasis, drain, laparoscopic cholecystectomy

INTRODUCTION:

Laparoscopic cholecystectomy [LC] is the gold standard treatment for cholelithiasis. It was introduced in mid 1980's [1]. The major advantages of LC includes less post-surgical pain, shorter post-operative hospital stay, earlier return to normal activities & better cosmetic outcome [2]. The importance of surgical drainage after laparoscopic cholecystectomy is an unresolved issue till now. Similarly, in laparoscopic cholecystectomy also, there is lack of strong evidence regarding usefulness of drain. Surgeons are divided among themselves regarding the use of drain after LC. Most surgeons habitually place prophylactic subhepatic drains in order to detect early complications like post-operative haemorrhage & leakage of bile. However, evidence based data do not support the routine use of prophylactic drainage in majority of the abdominal surgical procedures [3, 4, 5]. Few surgeons never place a drain, based on their personal experience and beliefs [6]. Moreover, some surgeons prefer an individual case based approach.

The objective of our present study is to evaluate the effects of subhepatic drainage after standard laparoscopic cholecystectomy in terms of various parameters like post-operative abdominal pain, right shoulder tip pain, post-operative wound infection, post-operative subhepatic collection & average hospital stay.

MATERIALS & METHODS:

This prospective study was conducted at the department of General Surgery in ESIC-PGIMSR, Joka from January 2018 to March 2020. 120 patients, who were diagnosed with symptomatic gall stone disease both clinically & radiologically, were included in this study. They were randomly divided into 2 groups of 60 patients each, according to the presence & absence of drain. Randomization was done by toss a coin method. All patients underwent standard laparoscopic cholecystectomy by the same surgical team. Prior to inclusion in the study groups, informed consents were obtained from all the patients under the supervision of institutional ethical committee. Certain exclusion criteria were also set beforehand.

EXCLUSION CRITERIA:

1. Age < 16 yrs & ≥ 70 yrs.
2. H/O previous upper abdominal surgeries.
3. Symptomatic cholelithiasis with deranged LFT.
4. Acalculous cholecystitis.
5. Gangrenous cholecystitis.
6. Comorbidities like cirrhosis of liver, Ascites & Coagulopathy.
7. Anesthetic fitness with ASA grading of 3 and above.

Standard post-operative care was given to all patients including antibiotics, analgesics & wound care as per institutional protocol. Both groups were compared and analyzed on the basis of age & sex distribution, post-operative complications like abdominal & right shoulder tip pain, wound infection, subhepatic collections & post-operative hospital stay.

RESULT:

The results were analyzed with SPSS for windows version 26 & the differences between groups were compared with appropriate statistical test. P-value less than 0.05 were regarded as statistically significant.

During the 26months period, 120 patients who underwent laparoscopic cholecystectomy were studied. The data were meticulously collected & analyzed.

Age distribution:

Table 1: age distribution of patients in both drain & non-drain group.

Age group (yrs)	Drain (n=60)	No drain (n=60)	Total
(16-19)	4(6.67%)	3(5%)	7(5.83%)
(20-29)	11(18.33%)	13(21.67%)	24(20%)
(30-39)	14(23.33%)	13(21.67%)	27(22.5%)
(40-49)	18(30%)	16(26.67%)	34(28.33%)
(50-59)	10(16.67%)	11(18.33%)	21(17.5%)
(60-69)	3(5%)	4(6.67%)	7(5.83%)

Note: Maximum no of patients belong to age group (40-49) yrs in both groups

Sex distribution:

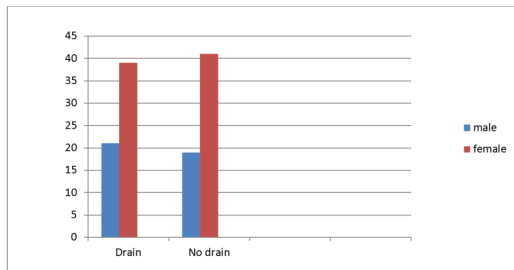


Figure 1: sex distribution of patients in both groups.

Sex distribution of patients in both the groups shows gall stone disease is more common in females.

Post-operative abdominal pain (24 hrs after surgery):

Post-surgical abdominal pain was assessed via visual analogue scale (VAS). The pain score goes thus:-

Grade 0: no pain

Grade 1: slight pain

Grade 2: average pain

Grade 3: more than average pain

Grade 4: moderate pain

Grade 5: severe pain

Figure 2: visual analogue scale

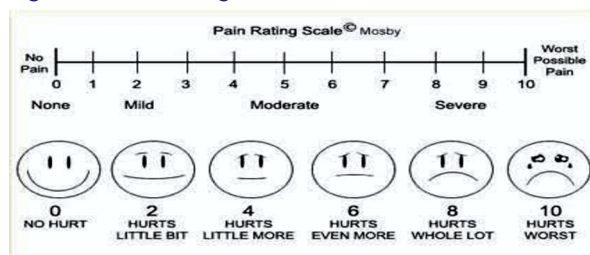


Table 2: post-operative abdominal pain (24 hrs after surgery) in both groups of patients

Pain	Drain (n=60)	No drain (n=60)	Total
G0	0(0%)	0(0%)	0(0%)
G1	10(16.67%)	14(23.33%)	24(20%)
G2	11(18.33%)	31(51.67%)	42(35%)
G3	27(45%)	10(16.67%)	37(30.83%)
G4	12(20%)	5(8.33%)	17(14.17%)
G5	0(0%)	0(0%)	0(0%)
Note: Chi square statistics 20.8836, p-value 0.0001 (<0.05)			

In our study, VAS median grade in patients with drain was G3 (45%), followed by G4 (20%). VAS median grade without drain group was G2 (51.67%), followed by G1 (23.33%) & G3 (16.67%). The p-value came as 0.0001 (< 0.05). So, there was statistically significant difference between these two groups.

Post-operative wound infection:

Table 3: Post-operative wound infection in both groups.

Wound infection	Drain (n=60)	No drain (n=60)	p-value
Present	3(5%)	1 (1.67%)	0.309
Absent	57 (95%)	59 (98.33%)	

In this study, wound infection was observed in 3 patients (5%) in the drain group and 1 patient (1.67%) in the non-drain group. As evident from the p-value, this difference was statistically insignificant.

Post-operative right shoulder tip pain:

Table 4: right shoulder tip pain after surgery in both groups.

Right shoulder pain	Drain (n=60)	No drain (n=60)	p-value
Present	1 (1.67%)	4 (6.67%)	0.170
Absent	59 (98.33%)	56 (93.33%)	

In the present study, right shoulder tip pain as a post-surgical complication was observed in 1 patient (1.67%) in the drain group & in 4 patients (6.67%) in the no drain group. However, no statistically significant difference was observed between these 2 groups here.

Post-operative subhepatic collection:

Table 5: Post of subhepatic collection after 24 & 72 hrs in both groups.

Subhepatic collection in ml	With drain		Without drain		p-value
	Mean	SD	Mean	SD	
24 hrs post-op	30.2	3.76	24.2	2.62	<0.0001
72 hrs post-op	25.4	2.21	22.8	3.27	<0.0001
Note: both are statistically significant					

In our study, mean subhepatic collection noted in patients with drain, 24 hrs after surgery, was 30.2 ml & after 72 hrs of surgery was 25.4 ml. However, mean subhepatic collection in patients without drain, after 24 & 72 hrs of surgery were 24.2 ml & 22.8 ml respectively. This difference was statistically significant in both cases, as per p-value calculation from student's unpaired t-test.

Post-operative hospital stays (days):

Table 6: Post-operative hospital stays in both groups.

Variable	With drain		Without drain		p-value
	Mean	SD	Mean	SD	
Hospital stay (days)	3.2	0.403	3.1	0.302	0.635

In the present study, mean hospital stay in patients with drain was 3.2 days whereas; in patients without drain was 3.1 days. The p-value came as 0.635 (>0.05). So, this difference was statistically insignificant.

DISCUSSION:

Subhepatic drainage after cholecystectomy, open or laparoscopic, is still an unsolved debate. In our study, the most commonly affected age group is (40-49) yrs; with 28.33% of cases. Similarly, in studies conducted by Aman Nagpal et al [7] & Mandeep Singh et al [8], the maximum numbers of cases are in the 4th decade.

In this study, we found that overall 66.67% of cases were female & 33.33% cases were male. Similar sex preponderance in favour of females was observed by Dumlu et al [9] in their study with 5:1 (F: M ratio). The study done by Aman Nagpal et al [7] also showed the male female ratio as 1:3.

In the present study, post-operative abdominal pain was evaluated using the visual analogue scale. We observed higher pain score with statistically significant difference in the drain group than the no-drain group; 24 hrs after surgery. The increase in pain following drain insertion is probably because of the peritoneal irritation & irritation of skin at the entry point of drain by a foreign body. This is in concurrence with the meta-analysis by C.S.Wong et al [10].

In this study, the incidence of early post-operative right shoulder tip pain was found to be higher in the no drain group than the group of patients with drain. However, this was statistically insignificant. Guruswamy et al [11] in a meta-analysis also reported decreased early post-operative shoulder pain in the drain group that was not significant statistically & reversed in the late post-operative period.

5% patient in the drain group developed wound infection in the post-operative period whereas, 1.67% patient in the no drain group developed the same. No statistically significant difference was found here between two groups. Similar observations were noted in studies done by Lewis & also in a study done by Druart & Huguier [12]. The increased rate of wound infection is probably due to ascending infection via the drain.

Table 7: wound infection in different studies.

Study	Drain	Without drain
Lewis	08/246	06/248
Druart	01/26	0/24
Huguier	03/50	02/50
Present study	03/60	01/60

In the present study, mean subhepatic fluid collection after 24 hrs of surgery were 30.2 ml & 24.2 ml in drain & non-drain group respectively. After 72 hrs of surgery, mean subhepatic collection in the drain group was 25.4 ml & 22.8 ml in the other group. Both were found to be statistically significant. A study conducted by Shamim [13] showed similar findings. However, study done by Picchio [14] showed 30 ml of mean subhepatic collection in both drain & without drain group. As per many authors, post-cholecystectomy collection in the subhepatic space are on the whole small, rapidly reabsorbed & essentially similar in size & number whether a drain is used or not. They also suggest that drain provokes leakage from superficial biliary ductules damaged by dissection and contend that without drainage it would rapidly wall off. In this way, higher volume of subhepatic fluid collection in the patients with drain can be explained.

We observed mean hospital stay was 3.2 days & 3.1 days in drain & without drain group respectively. However, this was not significant statistically, as shown by the p-value. Similar observations were obtained in the study conducted by Lewis & also in study done by Bawahab [15].

Table 8: mean hospital stay in different studies.

Study	With drain		Without drain	
	N	Mean (SD)	N	Mean (SD)
Lewis	246	5.9 (2)	248	5.5 (2)
Bawahab	38	4.48 (2.18)	65	2.50 (2.20)
Present	60	3.2 (0.403)	60	3.1 (0.302)

CONCLUSION:

From this study, we can conclude that the incidence of laparoscopic cholecystectomy is highest in the 5th decade & is more common in females. Insertion of drain causes statistically significant increase in post-surgical abdominal pain & subhepatic collection. Moreover, putting drain shows increased incidence of post-operative wound infection & post-operative hospital stay, though they are not significant statistically.

So, the routine use of drain after standard laparoscopic cholecystectomy has nothing to offer. It has to be used judiciously on the basis of the merit of individual cases, rather than putting it in all cases in general. It is always reasonable to avoid drain insertion when a dry operative field is obtained at the end of the procedure.

Funding: none

Conflict of interest: none

REFERENCES:

- Muhe E (1986): The first cholecystectomy through the laparoscope. *Langenbecks Archive of Surgery* 396(1): 804.
- Shaffer, E.A. (2006). Epidemiology of gall bladder stone disease. *Best practice & Research Clinical Gastroenterology*, 20 (6), 981-996. doi: 10.1016/j.bpg.2006.05.004.
- Launay-Savary MV, Slim K. Evidence-based analysis of prophylactic abdominal drainage. *Annales de Chirurgie* 2006; 131: 302-305.
- Karliczek A, Jesus EC, Matos D. Drainage or nondrainage in elective colorectal anastomosis: a systematic review and meta-analysis. *Colorectal Dis J Assoc Coloproctol Great Britain Ireland* 2006; 8: 259-265.
- Petrowsky H, Demartines N, Rousson V. Evidence-based value of prophylactic drainage in gastrointestinal surgery: a systematic review and meta-analyses. *Ann Surg* 2004; 240: 1074-1084; discussion 84-85.
- Askew JA. Survey of current surgical treatment of gall stones in Queensland. *Aust NZ J Surg*. 2005; 75:1086-9.
- Nagpal A, Goyal S, Abbey L & Singh A. (2012). Drainage in Cholecystectomy: Required or Not? A Comparative Randomized Study in Northern Indian Subjects. *World Journal of Laparoscopic Surgery with DVD*; 5: 63-66. doi: 10.5005/jp-journals-10007-1151.
- Singh M, Singh K, Chawla IS. (2017). Laparoscopic cholecystectomy with and without drainage- a comparative clinical study. *International Journal of*

Contemporary Medical Research 4 (1):117-120.

- Dumlu E.G, Kiyak G, Bozkurt B, Tokac M, Gurer A & Kilic M. (2013). Is a Drain Required after Laparoscopic Cholecystectomy? *The Eurasian Journal of Medicine*; 45(3):181-184. doi: 10.5152/eajm.2013.37.
- Wong CS, Cousins G, Duddy JC & Walsh SR. (2015). Intra-abdominal drainage for laparoscopic cholecystectomy: A systematic review and meta-analysis. *International Journal of Surgery*; 23:87-96. doi: 10.1016/j.ijsu.2015.09.033
- Gurusamy KS, Samraj K, Mullerat P Davidson BR (2007). Routine abdominal drainage for uncomplicated laparoscopic cholecystectomy. *Cochrane Database of Systematic Reviews*. doi: 10.1002/14651858.cd006004.pub2.
- Jackson PG, Evans SRT. The Biliary System, In: Townsend Jr CM, Beauchamp RD, Evers BM, Mattox KL (Eds). *Sabiston Textbook of Surgery*. 19th ed. Philadelphia: WB Saunders Pub; 2012; p.1597-1643.
- Shamim M. Routine sub-hepatic drainage versus no drainage after laparoscopic cholecystectomy: open, randomized, clinical trial. *Indian J Surg*. 2013; 75: 22-27.
- Picchio M et al. Meta-analysis of Drainage versus no drainage after laparoscopic cholecystectomy. *JSLs*. 2014; 4 (18): 7-9.
- Bawahab MA et al. Drainage vs non-drainage after cholecystectomy for acute cholecystitis: a retrospective study. *J Biomed Res*. 2014; 28(3): 240-45.