International Surgery Journal
Hassan AMA et al. Int Surg J. 2019 Aug;6(8):2708-2711
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: http://dx.doi.org/10.18203/2349-2902.isj20193312

Original Research Article

Laparoscopic cholecystectomy in hepatitis C liver cirrhosis patients: "to drain or not to drain: impact on postoperative pain"

Ahmed Mohamed Abdelaziz Hassan[1], Magdy M. A. Elsebae[1]*, Mohamed Abbas[1], Hussien Ezzat[1], Mohamed Z. Ali[2], Reeham Said Ebied[2]

[1]Department of General Surgery, Theodor Bilharz Research Institute, Giza, Egypt
[2]Department of Anaesthesiology and Surgical Intensive Care, Theodor Bilharz Research Institute, Giza, Egypt

Received: 29 March 2019
Revised: 22 May 2019
Accepted: 31 May 2019

***Correspondence:**
Dr. Magdy MA Elsebae,
E-mail: magdyelsebae@hotmail.com

ABSTRACT

Background: When cirrhotic patients with symptomatic gallstones require laparoscopic cholecystectomy (LC), the drainage tube is supposed to prevent postoperative abdominal radiating to the right shoulder, nausea and vomiting due to pneumoperitoneum using carbon dioxide gas**.** Aim of this work is to evaluate the effect of placing of drains on the incidence of postoperative pain, nausea and vomiting in those patients.
Methods: sixty-four patients with uncomplicated chronic calcular cholecystitis and liver cirrhosis were recruited for the study during the period from February 2017 to February 2019. They electively operated upon at the department of general surgery of Theodor Bilharz Research Institute (TBRI) using laparoscopic technique. Patients were subdivided into two equal groups Group-I (n=32); suction drains were placed in the sub-hepatic region (Morison's pouch) and Group-II (n=32), no drains were placed. Duration of surgery, postoperative shoulder tip pain and vomiting and analgesics requirement were evaluated and recorded.
Results: Operative time's difference was not statistically significant between the two groups. Drain group had a significant lower shoulder tip pain and analgesic requirement at post-operative 6 and 12 hours but that was higher After 12 hours, than group without drain. The overall incidence of nausea/vomiting was significantly higher statistically in group without drain than in drain group. Patients in drain group had a significantly longer hospital stay as compared to group without drain that was statistically significant.
Conclusions: Although the incidence of pain and nausea/vomiting are less in early post-operative period after LC with abdominal drain in hepatitis C liver cirrhosis patients; its routine use is not justified because post-operative pain and analgesic requirement after 12 hours is higher and hospital stay is longer.

Keywords: Laparoscopic cholecystectomy, Liver cirrhosis, Drain

INTRODUCTION

Routine abdominal drainage after Laparoscopic cholecystectomy (LC) is an issue of considerable debate. It was supposed to detect early blood or bile leaks and to allow carbon dioxide insufflated during laparoscopy to escape via drain site thereby decreased post-operative shoulder tip pain due to diaphragmatic irritation and nausea and vomiting due to intra peritoneal acidosis.[1] Several studies have reported that the role of abdominal drainage after uncomplicated LC is not advantageous and should be avoided.[2-9] With increasing practice of LC in liver cirrhosis patients with its associated problems, the effect of placing of abdominal drains was not studied.[10-12] Aim of this work is to determine the role of abdominal drain after LC in liver cirrhosis patients on the incidence of postoperative shoulder tip pain, nausea and vomiting.

METHODS

During the period from February 2017 to February 2019 all patients with non-complicated chronic calcular cholecystitis and liver cirrhosis scheduled for elective LC at the department of general surgery of Theodor Bilharz Research Institute (TBRI) were recruited for the study. All patients classified according to American Society of Anesthesiologists (ASA) score and Childe-Pughe-Turcotte (CPT) classification after the preoperative clinical evaluation and routine laboratory investigations. Inclusion criteria: age between 25 and 60 years, ASA score II or II and class A or B by CPT classification. Patients excluded from the study were those older than 60 years, with ASA-III or more, CPT class C, previous laparotomy, severe or refractory ascites and acute cholecystitis, BMI of ≥40 kg/m^2. Patients with preoperative international normalized ratio (INR) >1.5 received fresh-frozen plasma. Those with a preoperative platelets count <50,000/mm^3 were given platelet transfusions.

One surgical team performed all procedures under similar pneumoperitoneum pressure in almost similar operative times. Infection control protocol measures and technical modifications that avoid of varices during trocar placement, avoidance of excess traction on the gall bladder and avoidance of dissection of the periportal area were followed with careful closure of port site wounds. Just after completion of the surgery before trocar removal, the patients were subdivided into two equal groups using sealed envelope technique; Group-I (n=32); suction drains were placed in the sub-hepatic region (Morison's pouch) and Group-II (n=32), no drains were placed.

Preoperative variables, operative times and postoperative course particularly shoulder tip pain and/or vomiting were recorded. Post-operative pain, analgesics requirement at first 6 h, at 12 h and 24 h postoperatively as well as, hospital stay were recorded.

The data was analyzed using SPSS version 16.0 and Microsoft Excel 2007. Results were expressed as mean, mean±standard deviation (SD) or number (percent). Comparison between categorical data [number (%)] was performed using Chi square test. P≤0.05 was considered significant.

RESULTS

LC performed for sixty-four patients with liver cirrhosis in our study. Liver cirrhosis diagnosed in all patients was related to hepatitis C viral infection on clinical, biochemical, serum virus titers and histopathology findings. Overall mean patient age was 43.6 years (range 34-64 years). 48 were females (75%) and 16 were males (25%). Age, gender and CPT class distribution was comparable in both groups of the study (Table 1).

Table 1: Pre-operative data of the study groups.

	Group-I (n=32)	Group-II (n=32)
Age (mean, range) yrs.	41.9 (36-63)	41.2 (31-64)
Male/female ratio	9/26	7/22
Childe-Pughe-Turcotte N (%)		
I	28 (87.5)	27 (84.3)
II	4 (12.4)	5 (15.6)
III	0 (0)	0 (0)

None of the patients was converted to open cholecystectomy. There was no statistically significant difference of the operative time for both groups (Table 2). At 6 -12 post-operative hours, shoulder tip pain was significantly lower in the group I but, After 12 hours, group I had higher shoulder tip pain than group II (Table 2). Analgesic requirement was higher in group II at post-operative 12 hours after which it was higher in group I. Mean value of the times for 1st dose analgesia requirement for group II was statistically significant shorter than in groups I (Table 2). The overall incidence of nausea/vomiting was more in group without drain than in drain group which was statistically significant (Table 2).

There was no postoperative mortality. Postoperative complications are shown in (Table 2). Patients in Group I had a longer hospital stay as compared to Group II that was statistically significant. Four patients of group-I required more pain control for further 24 hours. One patient with bile leakage of group-I was treated conservatively and the leakage stopped spontaneously after 3 days. Post-operative continuous ascites fluid leakage occurred in three of patients of group-I. They received medical treatment with diuretics and intravenous albumin infusions for 4 days until leakage stopped.

Table 2: Operative and post-operative data.

	Group-I (n=32)	Group-II (n=32)	P value
Operative time (mean, range) minutes	70.0 (52-80)	62. 6 (55-65)	0.065 *
Shoulder tip pain (N (%))			
6 hours	4 (12.51)	9 (28.1)	0.020**
12 hours	6 (18.82)	12 (37.6)	0.030**
24 hours	12 (37.6)	4 (12.5)	0.010**

Continued.

	Group-I (n=32)	Group-II (n=32)	P value
Analgesia requirement time for 1st dose (± SD) (h)	6.16±1.73	1.72±0.67	0.001**
6 hours	6 (18.81)	22 (68.8)	0.001**
12 hours	15 (46.81)	20 (62.5)	0.155*
24 hours	11 (34.40)	4 (12.5)	0.010**
Post-operative nausea / vomiting (N (%))			
6 hours	6 (18.81)	16 (50.0)	0.002**
12 hours	6 (18.82)	12 (37.6)	0.002**
Post-operative complications (N (%))			
Trocar site hematoma	1 (3.10)	0 (0)	0.001**
Ports sites infection	1 (3.12)	1 (3.1)	0.0
Post-operative ascites	3 (9.38)	0 (0)	0.001**
Post-operative bile leakage	1 (3.11)	0 (0)	0.001**
Hospital stay(mean) days	3.56	1.5	0.001**

**Significant at p<0.05,* insignificant at p>0.05.

DISCUSSION

Our study revealed that in the first post-operative 12 hours following LC for patients with liver cirrhosis; the shoulder tip pain was lower in drain group patients however, after 12 hours; they had higher shoulder tip pain than the group without drain. Also, analgesic requirement was higher in drain group up to 12 hours after which it was higher in the group without drain which are consistent with some studies.[5-9] Although, the origin of referred pain to the shoulder after laparoscopy is not completely understood; authors agree about what was supposed that less shoulder tip pain in initial hours is due to the drain removes retained CO_2 which causes stretching of the peritoneum and diaphragm results in tearing of blood vessels, traction on nerves, and release of inflammatory mediators that elicits referred pain to the shoulder and phrenic nerve neuropraxia secondary to pneumoperitoneum.[13-15] It has been shown that the degree of stretching is a significant source of postoperative pain.[16,17] The increased incidence of referred pain to the shoulder beyond 24 hours is due that drain irritates the diaphragm.

In this study there was more overall incidence of nausea/vomiting in group without drain than in drain group which was statistically significant which is consistent with all studies.[5-9] Intra peritoneal acidosis by insufflated CO2 is the proposed mechanism of increasing nausea/vomiting and drain placed in sub hepatic space acts as a conduit for the escape of retained CO2 which leads to less post-operative nausea/vomiting.[13-17]

The use of drains has been shown to increase the rates of intra-abdominal and wound infections, decrease the pulmonary function, and prolong hospital stay therefore, low-pressure pneumoperitoneum techniques found to reduce the incidence and severity of postoperative nausea and vomiting, and the intensity and frequency of right shoulder pain.[4,5] Their safety, efficacy, near-equal operative time and surgeon's satisfaction appear to be comparable with standard-pressure pneumoperitoneum.[18-20]

Patients drain group had a statistically significant longer stay as compared to the group without drain due to the fact that none of patients in the drain group could be discharged before removal of the drain. Authors conclude that the routine use of a drain in elective uncomplicated laparoscopic cholecystectomy in patients with liver cirrhosis has nothing to offer; in contrast, it is associated with increased pain. The consequences of loss of ascites fluid which may occur after surgery are troublesome in those patients. It would be reasonable, however, to leave a drain if there is a worry about an unsolved or potential bile leak, i.e., imperfect closure of cystic duct or bile staining in the lavage fluid or gall bladder bed bearing in mind that drain placement, although sometimes providing a false sense of security, does not guarantee either prevention or treatment of postoperative bile collections, bleeding, or bile peritonitis.

CONCLUSION

Routine use of abdominal drain after LC in hepatitis C liver cirrhosis patients is not justified because post-operative pain and analgesic requirement after 12 hours is higher and hospital stay is longer.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Nursal TZ, Yildirim S, Tarim A, Noyan T, Poyraz P, Tuna N. Effect of drainage on post-operative nausea, vomiting, and pain after laparoscopic cholecystectomy. Langenbecks Archive of Surgery. 2003;388(2):95-100.
2. Capitanich P, Segundo UL, Malizia P, Herrera J, Lovaldi ML. Usefulness of prophylactic drainage in

laparoscopic cholecystectomy. Randomized prospective report. Prensa Medica Argentina. 2005;92(9):623-7.
3. Mrozowicz A, Rucinski P, Polkowski WP. Routine drainage of the subhepatic area after laparoscopic cholecystectomy. Prospective, controlled study with random patient selection. Polski Przeglad Chirurgiczny. 2006;78(5):597-609.
4. Uchiyama K, Tani M, Kawai M, Terasawa H, Hama T, Yamaue H. Clinical significance of drainage tube insertion in laparoscopic cholecystectomy: a prospective randomized controlled trial. J Hepatobiliary Pancreat Surg. 2007;14(6):551-6.
5. Picchio M, Tzovaras G, Liakou P, Fafoulakis F, Baloyiannis I, Zacharoulis D, Hatzitheofilou C. Is there a role for drain use in elective laparoscopic cholecystectomy? A controlled randomized trial. Am J Surg. 2009;197(6):759-63.
6. Lucarelli P, Di Filippo A, De Angelis F, Stipa F, Spaziani E. Meta-analysis of drainage versus no drainage after laparoscopic cholecystectomy. JSLS. 2014;18(4):e2014.00242.
7. Antoniou S, Koch O, Antoniou G, Köhler G, Chalkiadakis G, Pointner R, et al. Routine versus no drain placement after elective laparoscopic cholecystectomy: meta-analysis of randomized controlled trials. Minerva Chir. 2014;69(3):185-94.
8. Wong CS, Cousins G, Duddy JC, Walsh SR.Intra-abdominal drainage for laparoscopic cholecystectomy: A systematic review and meta-analysis. Int J Surg. 2015;23(Pt A):87-96.
9. Sharma A, Mittal S. Role of Routine Subhepatic Abdominal Drain Placement following u ncomplicated laparoscopic cholecystectomy: a prospective randomised study. J Clin Diagn Res. 2016;10(12):PC03-PC05.
10. Leandros E, Albanopoulos K, Tsigris C. Laparoscopic cholecystectomy in cirrhotic patients with symptomatic gallstone disease. ANZ J Surg. 2008;78:363–5.
11. Hamad MA, Thabet M, Badawy A. Laparoscopic versus open cholecystectomy in patients with liver cirrhosis: a prospective randomized study. J Laproendosc Adv Surg Tech A. 2010;20(5):405–9.
12. Chmielecki DK, Hagopian EJ, Kuo YH, Kuo YL, Davis JM. Laparoscopic cholecystectomy is the preferred approach in cirrhosis: a nationwide, population-based study. HPB (Oxford). 2012;14(12):848-53.
13. Donatsky AM, Bjerrum F, Gögenur I. Surgical techniques to minimize shoulder pain after laparoscopic cholecystectomy. A systematic review. Surg Endosc. 2013;27(7):2275-82.
14. Sandhu T, Yamada S, Ariyakachon V, Chakrabandhu T, Chongruksut W, Ko-iam W. Low-pressure pneumoperitoneum versus standard pneumoperitoneum in laparoscopic cholecyst-ectomy, a prospective randomized clinical trial. Surg Endosc. 2009;23:1044–7.
15. Kandil TS, El Hefnawy E. Shoulder pain following laparoscopic cholecystectomy:factors affecting the incidence and severity. J Laparoendosc Adv Surg Tech A. 2010;20:677–682
16. Wallace DH, Serpell MG, Baxter JN, O'Dwyer PJ. Randomized trial of different insufflation pressures for laparoscopic cholecystectomy. Br J Surg. 1997;84:455–8.
17. Jackson SA, Laurence AS, Hill JC. Does post-laparoscopy pain relate to residual carbon dioxide? Anaesthesia. 1996;51:485–7.
18. Bhattacharjee HK, Jalaludeen A, Bansal V, Krishna A, Kumar S, Subramanium R, et al. Impact of standard-pressure and low-pressure pneumo-peritoneum on shoulder pain following laparoscopic cholecystectomy:a randomised controlled trial. Surg Endosc. 2017;31(3):1287-95.
19. Vijayaraghavan N, Sistla SC, Kundra P, Ananthanarayan PH, Karthikeyan VS, Ali SM, et al. Comparison of standard-pressure and low pressure pneumoperitoneum in laparoscopic cholecyst-ectomy: a double blinded randomized controlled study. Surg Laparosc Endosc Percutan Tech. 2014;24(2):127-33.
20. Hua J, Gong J, Yao L, Zhou B, Song Z. Low-pressure versus standard-pressure pneumo peritoneum for laparoscopic-holecystectomy: a systematic review and meta-analysis. Am J Surg. 2014;208(1):143-50.

Cite this article as: Hassan AMA, Elsebae MMA, Abbas M, Ezzat H, Ali MZ, Ebied RS. Laparoscopic cholecystectomy in hepatitis C liver cirrhosis patients: "to drain or not to drain: impact on postoperative pain. Int Surg J 2019;6:2708-11.