Tube drainage versus without drain laparoscopic cholecystectomy

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ABSTRACT
Background: Laparoscopic cholecystectomy (LC) is the gold standard for the surgical treatment of cholelithiasis. Routine intra-abdominal drainage after elective LC is an issue of considerable debate.
Objective: To evaluate the advantages and disadvantages of intra peritoneal drain insertion in patients undergoing Laparoscopic cholecystectomy.
Patient and Methods: We conducted this study at the surgical ward of Al-khadhmyia teaching hospital in the period from the 1st of September 2019 to the end of January 2020. A comparison between intra-abdominal drainage cholecystectomy from without drainage cholecystectomy was made based on a study in 60 randomly chosen cases underwent elective LC for symptomatic gall stone. Patients were divided before surgical procedure into two groups. Group A includes 30 patients in whom a drain was placed in subhepatic space and group B consisted of 30 patients without drain. Postoperative pain, nausea vomiting and discomfort, hospital stay and surgical site infection were assessed, in addition the two groups were evaluated and compared regarding other possible postoperative complications.
Results: All the cases in this study were elective uncomplicated laparoscopic cholecystectomy. 60 cases with age range from 17-74 years were included in the study, twenty eight (93.3%) patients in group A had pain at the drain site after 24th hours and the pain was persisting in 25 (83.33%) patients even at 48th hour after surgery. While in group B nineteen (63.33%) patients had pain at port sites after 24th and 10 (33.33%) patients had pain at 48th hour after surgery. The pain was higher in group A by more than two points on the average in VAS (Visual Analogue Scale) at 24 and 48 hours. Postoperative complications were more frequently seen in Group A. Pain in the right shoulder was more often observed in Group B. Nausea, vomiting was more common in Group A. Nine patient had superficial wound infection of the epigastric port in the postoperative period in Group A while no one in group B. The hospital stay was obviously longer in drain group than non-drain one 2-4 / 1-2 days subsequently.
Conclusion: The routine drainage of gallbladder bed after elective laparoscopic cholecystectomy may not be justified and appears to cause more postoperative pain and more postoperative complications and prolongs the hospital stay.

Keywords: Cholecystectomy, intraperitoneal drain, illness, health, medico challenge

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INTRODUCTION

Cholelithiasis is among the most common gastrointestinal illness. Among all the surgical diseases of gastrointestinal tract, cholecystectomy is the most commonly performed elective surgery worldwide. Cholecystectomy remains the treatment of choice for symptomatic gall stone despite the challenges of dissolution therapy and lithotripsy. The introduction of laparoscopic cholecystectomy (LC) as an alternative to the conventional removal of gall bladder by Philippe Mouret in 1987 has revolutionized this procedure. Nevertheless, controversy regarding the routine use of drainage after elective LC still exists. Surgeons have drained after LC because of fear intraperitoneal fluid collections and to detect early complications, such as postoperative hemorrhage and leakage of bile that may requires open procedures. Another reason for draining is to allow CO2 insufflated during laparoscopy to escape via the drain site leading to decreased shoulder pain.
However, with the development of laparoscopic surgery and advancement of surgical techniques, prophylactic drainage of the abdomen after surgery has since been questioned. Several trials have shown that drains were of no benefit after gastrectomy\(^5\), hepatic resection\(^6\), splenectomy\(^7\), pancreatic resection\(^8\), colonic resection\(^9\) as well as elective LC for uncomplicated cholecystitis\(^10, 11\). It seems that drainage does not prevent postoperative complication, instead, drainage-related complications such as fever, wound infection, wound hernia, or hemorrhage may cause unnecessary discomfort to the patients\(^5, 12\), therefore we conducted this study to compare between those received drainage and those without drainage.

The aim of study

Evaluation of the advantage and disadvantage of routine intra peritoneal drain insertion following uneventful elective laparoscopic cholecystectomy.

**Patients and Methods**

This prospective study was conducted at the surgical ward of Al_khadhmyia teaching hospital from the 1\(^{st}\) of September 2019 to the end of January 2020. A comparison between drainage cholecystectomy with non-drainage one was made based on a study of 60 randomly chosen cases underwent elective straight forward LC for symptomatic gall stone. Those with complication like bleeding and or bile duct or suspicion of visceral injury have been excluded from the study.

Patients were divided into two groups. Group A includes 30 patients in whom a drain was placed in the subhepatic space and group B 30 patients received no drain. All patients were confirmed to have symptomatic cholecystitis after full history and ultrasonography examination. All patients were submitted to appropriate biochemical and hematological tests and chest X-ray. Patients demographic data, details post operative follow up till drain removal and/or patient discharge were collected and analyzed.

The post operative pain was evaluated using a special designed ruler numerated from 0 to 10 (VAS) and ask the patients about their pain and chosen the number from 0 to 10 that’s best described his pain, “0” represents no pain; “10” represents the most unbearable pain they felt.

**Results**

All 60 cases in this study were elective laparoscopic cholecystectomy. The age range was 19-74 year and the average of patients in group A and B were 36.75 -37.25 years subsequently. Male to female ratio in group A was 1:2.6 and in group B 1:3.2.

Table (1) shows incidence of postoperative pain. Twenty eight (93.3%) patients in group A had pain at the drain site after 24th hours and the pain was persisting in 25 (83.33%) patients even at 48th hour after surgery. While in group B nineteen (63.33%) patients had pain at port sites after 24th and 10(33.33%) patients had pain at 48th hour after surgery. The pain was higher in group A by more than two points on the average in (VAS) at 24 and 48 hours as shown in table (2).

<table>
<thead>
<tr>
<th>Time (Hrs)</th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>28(93.3%)</td>
<td>19(63.33%)</td>
</tr>
<tr>
<td>48</td>
<td>25(83.33%)</td>
<td>10(33.33%)</td>
</tr>
</tbody>
</table>

**Table 2. VAS score of pain**
<table>
<thead>
<tr>
<th>Time (Hrs)</th>
<th>Group A Mean</th>
<th>Group B Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>5.58</td>
<td>3.81</td>
</tr>
<tr>
<td>48</td>
<td>5.41</td>
<td>3.45</td>
</tr>
</tbody>
</table>

**Table 3. Postoperative complications in two groups**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Group A (%)</th>
<th>Group B (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nausea</td>
<td>20(66.6%)</td>
<td>8(26.6%)</td>
</tr>
<tr>
<td>Vomiting</td>
<td>7(23.3%)</td>
<td>4(13.3%)</td>
</tr>
<tr>
<td>Pain on right shoulder</td>
<td>3(10%)</td>
<td>4(13.3%)</td>
</tr>
<tr>
<td>Surgical site infection</td>
<td>9(30%)</td>
<td>0</td>
</tr>
</tbody>
</table>

Postoperative complications were more frequently seen in Group A. Pain in the right shoulder was more often observed in Group B. Nausea and vomiting was more common in Group A, nine patient had superficial wound infection of the epigastric port in the postoperative period in Group A while there no wound infection in group B as shown in table (3).

In all patients with drainage, the drain content was serosanguinus and serious There was no bile leak in group A. Duration of keeping the drain were ranging from two to four days, in all patients with group A the drainage was a prophylactic indication, accordingly the hospital stay was long in association with drainage group A, it was 1-4 days, while in group B it was 1-2 days.

Patients in group B were assessed clinically as well as radiologically for the presence of collection. Ultrasound abdomen to assess the collection was advised only if suspected clinically by the presence of increased in severity or persistence of pain, prolonged ileus (> 48 hours), fever and abdominal signs of localized or generalized peritonitis, no one of these complications were reported.

**DISCUSSION**

Laparoscopic cholecystectomy is the gold standard for the treatment of cholelithiasis. When compared to open surgery it offers various benefits like faster recovery, shorter hospital stay, and better postoperative outcome, fewer complications and it allows the surgeon to perform operations more precisely and more anatomically, minimizes damage to the surgical bed, and therefore minimizes the need for drainage of the gallbladder bed. 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 but still there is no clear cut practice regarding this. Surgeons have routinely drained after LC because of a fear of collection of bile and blood requiring open procedures\(^2\), another reason for drainage is to allow CO2 insufflate during laparoscopy to escape via the drain site, thereby decreasing the shoulder pain\(^2,13\). This is not always true, however, as was shown by Truedson H in their prospective study\(^14\). Similarly, in a review of 1546 cases of cholecystectomy,
only 0.26% of the patients were reoperated because of collection of bile \(^{(15)}\). Likewise, in Monson JR et al whom reviewed 1277 patients, only 16 patients had to be reoperated because of bile peritonitis and notably all 16 patients had drains \(^{(16)}\). Further Hoffman J et al, in a review of 8423 cases there was a subhepatic collection or abscess in 0%-7% in the patients with drains, and only 0%-4% in patients without a drain \(^{(17)}\). In our study none of both groups had complications like bile leak or subhepatic collection or abscess requiring reoperation.

In this study we used (VAS) to assess the severity of postoperative pain and found that the proportion of the patients having pain for 24 and 48 hours was more in those having drain. Uchiyama et al found that the mean (VAS) scores were significantly greater in drain group at 24 and 48 hours \(^{(18)}\). Another study done by Tzovaras G et al suggested that the routine use of drain in elective LC has nothing to offer and it is associated with increased pain \(^{(19)}\).

In our study we found that the incidence of nausea and vomiting was slightly higher among patients with drain as compared to those with no drain which may be due to more need for analgesia and subsequently their side effect like nausea and vomiting. Picchio M et al and Hawasli A et al \(^{(20)}\) suggested that there was no statistically significant difference among the incidence of nausea and vomiting in postoperative period with or without drain use.

Wounds infection were reported in this study in association with drainage group A (nine patients), while no one had infection in group B, this is possible due to that drain insertion considered another invasive practice. Gurusamy K Set al in their study reported that wound infection tended to be higher in those with a drain \(^{(21)}\).

In this Study results reveal that there is no significant effect or differences of drain insertion on shoulder pain. These findings are supported by the studies conducted by Gurusamy K Set al \(^{(21)}\) and Picchio M et al \(^{(20)}\) in which they reported that there was no statistically significant difference in occurrence of shouldertip pain with drain use.

Drains can also lead to a series of complications described in literatures such as migration of the drain, breaking of the drain, fever associated with the drain and perforation of the intestine, although no one did happened in our series \(^{(22)}\). However, the issue is not whether the use of the drain in LC is superior to the avoidance of drain, but whether the patient is in obvious hazard if a drain is not used. In elective LC, drain should not be used because it is of no preventive or therapeutic advantage, further it prolong the hospital stay as we reported in our and other series, in addition to its dangerous complications \(^{(14, 16, 21, 24, 25)}\). The clinically significant bile leak following laparoscopic cholecystectomy is generally uncommon and usually minor (0.3-0.6% recent reported incidence) and it cannot be prevented by or justifies the use of a drain \(^{(17, 19, 26, 27)}\).

**CONCLUSION**

The inferred vision from this study isthat the trend of routine insertion of intra peritoneal drain after elective non complicated laparoscopic cholecystectomy should be discouraged as the usage of drain is clearly affect the patient post-operative quality of recovery and delay patient's discharge from the hospital. However in selected patients with potential risk of bile leak as in complicated or difficult cholecystectomy due to inflamed gallbladder and/or adhesions, drainage may be justified. Drains should be inserted with utmost care with regular post-operative inspection and follow up till time of removal.
ETHICAL CLEARANCE

The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

CONFLICT OF INTEREST

None

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References