ABSTRACT

Background: Laparoscopic cholecystectomy has rapidly become a preferable technique for treating patients with symptomatic cholelithiasis. To date, new developments in instrumentation have hardly been able to keep pace with the rising popularity of this method.

Aim: This study aims to describe a maneuver that can be followed during laparoscopic cholecystectomy which is presumed to be helpful in easing gall bladder dissection from its hepatic bed.

Patients and Methods: All patients scheduled for laparoscopic cholecystectomy during the period from January 2007 to June 2009 were included in this study. This maneuver was applied in cases when three ports approach was followed for the laparoscopic cholecystectomy and especially when the gall bladder was found to be large, tall, and redundant in whom its dissection from hepatic bed was presumed to be difficult without good retraction. Patients were divided into two groups; Group (1) in whom rolling of the gall bladder was applied and group (2) in whom the laparoscopic cholecystectomy was performed in the usual way. Pneumoinsufflation was created following closed or open method. Dissection at the Calot’s triangle with control of cystic duct and artery will be performed in the usual way. The left handed 5mm grasper will be applied to just above the distal clip on the cystic duct stump. Gall bladder dissection will be proceeded using the diathermy or Harmonic (ULtracision). On going on redundancy of gall bladder will interfere with its dissection. At this point good retraction will be achieved simply by anti-clockwise twist of the grasper, rolling the gall bladder around its shaft. This maneuver will clarify the bloodless plane and so dissection of gall bladder will progress easily.

Results: From January 2007 to June 2009, 234 laparoscopic cholecystectomies were performed for patients with cholecystolithiasis. Laparoscopic cholecystectomy accomplished through three - port was successful in 177 patients (66 %) versus 58 patients (44%) in whom four ports were required for the laparoscopic cholecystectomy. This maneuver was applied in 143 cases (61%) (group1). In 122 patients (70%) of group (1) three port approaches was followed. Over all the mean operative time was 36 minutes. In group (1), the mean operative time was 34 minutes versus 35 minutes in group (2). The overall incidence of perforation of gall bladder was 20 %, it was 8% in (group1) versus (12%) in (group2). No patient conversion to open cholecystectomy was needed. No major intraoperative or post operative complications were reported during the period of study.

Conclusions: This method facilitates the procedure of laparoscopic cholecystectomy and even may avoids the need for the forth trocar rendering three-port approach to laparoscopic cholecystectomy easier.

Key Words: laparoscopic cholecystectomy, rolling, dissection
INTRODUCTION

Laparoscopic cholecystectomy is the standard procedure all over the world (1,2). A lot of modifications were going on since its early times with the development of new techniques and innovation of new instruments helping in better performance of the surgery.

During LC dissection of the GB is highly facilitated by its retraction from its liver bed and so clearly identifying the dissection plane. Dissection of GB is little more difficult by adopting the three-port approach as long as fundal retraction that is accomplished by the forth port in the right flank is missing. To overcome this problem, there is a need for changing the grasping points on the GB keeping near its hepatic attachment in order to ensure good retraction for proper dissection. These grasping points are risky for perforating the GB.

The aim of this study is to describe a maneuver that can be followed during LC which is presumed to be helpful in easing GB dissection from its hepatic bed.

PATIENTS AND METHODS

All patients who underwent LC in Al-Jumhori Teaching Hospital during the period from January 2007 to June 2009 were included in this study. Patients were operated upon by one team headed by one surgeon. They were divided into two groups; Group1 included those patients in whom this maneuver “rolling of the GB” was adopted, and Group2 included those patients in whom this manoeuvre was not followed.

The Procedure

Initial steps of the LC were similar to the standard procedure; Pneumoperitoneum created by open method (modified Hasson) or closed method by Veress needle. Three – port approach was initially adopted for all patients. Placement of fourth port was decided whenever required. Clear identification of Calot’s structures and dealing with the cystic duct and artery were followed in the usual way. On starting dissecting the GB from its hepatic bed, the left handed 5mm grasper manipulated to grasp the GB on the stump of cystic duct just above the clip that was applied on its distal side or through the neck of GB, (Figure 1). Anti-clockwise twist of the grasper will roll the GB up around the shaft of instrument and by little shifting of the grasper upwards and laterally will perform excellent retraction of the GB and stretching it out from its hepatic bed, identifying the bloodless plane of dissection, and so easing its dissection, (Figure 2 and 3). This maneuver sometimes did peel the gall bladder from its hepatic bed without the need even for any dissecting modality.

Figure (1): Step 1 grasping the stump of cystic duct
RESULTS

Laparoscopic cholecystectomy was performed in 234 patients having had cholecystolithiasis during the period of study from January 2007 to June 2009. Laparoscopic cholecystectomy accomplished through three ports was successful in 176 patients (75%) versus 58 patients (25%) in whom insertion of forth 5mm grasper was required for fundal retraction.

This maneuver was applied on 143 cases (61%) [Group 1], versus 91 cases (39%) [Group 2] in whom CL was performed without this maneuver. Group 1 patients included 123 patients (86%) underwent LCs using three ports and 20 patients (14%) where LC was performed using four ports. Group 2 patients included 54 patients (59%) where LC was performed by three ports and 37 patients (41%) in whom LC was done using four ports (Table 1).
Table (1): Distribution of patients in both groups

<table>
<thead>
<tr>
<th>Approaches</th>
<th>Group 1 &quot;Rolling of GB&quot;</th>
<th>Group 2 &quot;Non-rolling of GB&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Three ports</td>
<td>123</td>
<td>86</td>
</tr>
<tr>
<td>Four ports</td>
<td>20</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>143</td>
<td>100</td>
</tr>
</tbody>
</table>

Over all, the mean operation time was 36 minutes. In group 1 the mean operation time was 34 minutes versus 35 minutes in group 2 [p=0.2], statistically not significant.

Perforation of GB occurred in 47 patients of all patients (20%). In group 1 perforation of GB occurred in 19 patients (13%), while in group 2 it occurred in 28 patients (31%), [p= 0.001] a difference of highly significant value, (Table 2). In 15 patients (32%) of both groups the perforation occurred at the grasping points as a result of mechanical trauma to the GB, while in 32 patients (68 %) it was attributed to diathermy injury to the GB wall, (Table 3). In group1; diathermy injury was the cause of GB perforation in all cases, while in group 2; diathermy injury occurred in 13 patients (46%) and mechanical trauma in 15 patients (54 %), (Table 3).

Table (2): Intraoperative perforation of gall bladder

<table>
<thead>
<tr>
<th>Groups</th>
<th>No.</th>
<th>GB perforation</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1 (Rolling of GB)</td>
<td>143</td>
<td>19</td>
<td>13</td>
</tr>
<tr>
<td>Group 2 (Non-Rolling of GB)</td>
<td>91</td>
<td>28</td>
<td>31</td>
</tr>
<tr>
<td>Total</td>
<td>234</td>
<td>47</td>
<td>20</td>
</tr>
</tbody>
</table>

Table (3): Causes of gall bladder perforation

<table>
<thead>
<tr>
<th>GB perforation</th>
<th>Mechanical</th>
<th>Diathermy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Group 1 (Rolling of GB)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Group 2 (Non-Rolling of GB)</td>
<td>15</td>
<td>54</td>
</tr>
</tbody>
</table>

In 5 patients there was a narrowing of the space between the lower ribs and liver which leads to limiting the working window and so interfered with proper retraction of GB to produce clear plane of dissection. By using this maneuver this obstacle was easily overcome. No major intraoperative or post operative complications were reported during the period of study. Adding to that, no conversion to open cholecystectomy was needed.
DISCUSSION

Laparoscopic cholecystectomy is now regarded as the gold standard for patients with cholecystolithiasis \(^{(1,2)}\). In our center, LC was introduced since 1995 and over 3000 procedures have been carried out to the present time.

Since its introduction by Mouret at 198, a lot of modifications to the technique are going on \(^{(1,2)}\). These modifications aimed either to further decrease the invasiveness of this procedure by decreasing the number of ports or by using small sized instruments, or improving the technique of this surgery by using modern machines like Harmonic and Ligasure \(^{(3-8)}\).

This study was a presentation of a maneuver that can be followed during LC in particular during dissection of the GB from its hepatic bed.

On reviewing the literature two articles were shown describing a similar maneuver applied for appendicectomy and cholecystectomy with promising results \(^{(9,10)}\). The present study work may add more confirmation to the usefulness of this technique during LC.

The results after following this maneuver were found to be promising, since, perforation of GB is one of the not uncommon complications during LC and its incidence was 26% (range 10 – 36%) in most series \(^{(11-14)}\). In most cases this complication is attributed either to inadvertent diathermy of the wall of gall bladder or traumatic injury at the grasping points in the gall bladder \(^{(11,14)}\). In this study, the overall incidence of GB perforation was 20%. Preferably the incidence of GB perforation was low in those patients when this maneuver was applied; the incidence was only 13% in group1 versus 31% in group2. This low incidence of GB perforation may be attributed to two points:

1. Fixed grasping point on the GB during the whole procedure. During the standard LC, the left handed grasper is usually manipulated by the surgeon to grasp the GB near the infandibulum and retracting it upwards and laterally. Usually there was a need for changing the grasping point on the GB on continuous dissection aiming to be near the attachment of GB to its hepatic bed in order to maintain good retraction and so clearing the plane of dissection. These grasping points on the GB were risky and may lead to perforation. When applying the rolling technique, usually the grasping point maintained to one point during the whole dissection process. As such, this factor may be attributed to the decreased incidence of GB perforation and abolishing the mechanical cause of perforation.

2. Clear plane of dissection achieved by this technique was regarded as another factor for decreasing the incidence of GB perforation by diathermy.

In this study the overall mean operation time was 35 minutes while in other series it was 45 minutes \(^{6}\). In those patients when this maneuver was followed, the mean operation time was 34 minutes. Although this result has no significant value but at least this maneuver did not lengthen the duration of LC.

This maneuver was found to be of value in decreasing the need for insertion of forth port making three-port approach more easily applied. In group1, forth port was needed in 8.5% versus 16% in group2.

In few cases (5 patients) the window between the liver and lower rib was narrow, making retraction of GB upwards and laterally little embarrassing. This maneuver was found to be of great help in facilitating GB dissection in such cases.

REFERENCES


