GALLBLADDER DISEASES ASSOCIATED WITH LAPAROSCOPIC SLEEVE GASTRECTOMY IN JORDAN, PILOT STUDY

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Abstract

Background: Gallbladder diseases occurring in morbid obese patients, who underwent laparoscopic sleeve gastrectomy (LSG), are of scarce reports and not well established in the Middle East especially in Jordan.

Introduction: Gallstones commonly develop after bariatric surgery; but the incidence of gallstone development after SG has not been adequately studied.

Patients and Methods: A retrospective review of collected database of 325 patients that underwent LSG in King Hussein Medical Centre and Prince Rashid Military Hospital was reviewed during the period of 1-1-2014 till 1-6-2017. Follow-up abdominal ultrasonography was performed once the patients achieved ¼th of their weight loss, or if develop symptoms related to gallbladder problems, or after 6 months post-surgery. We analyzed all patients who involved in this study since the last 3 ½ years.

A statistically significant increase in % excess weight loss was observed in patients with gallstones (40.4%). Percentage of gallbladder problems in the first year postoperatively was 12% (50 patients) which is much higher than that occurring during the remaining 2 ½ years in 8 %( 20 patients) only in the remaining observed study period.

Results: Preoperatively, gallbladder disease was identified in (46 patients) 14% of the patients .Postoperatively (65 patients) 26% had gall bladder disease.

Conclusion: Risk of gallstone formation during the first year post laparoscopic sleeve gastrectomy was much higher than the remaining 2 ½ years in the study duration.

Introduction

It is well known that fatty persons are having more risk for developing gall bladder diseases and stones especially cholesterol stones ,this is due to increased cholesterol concentration by the liver secretions. The incidence increases due to rapid weight loss as a result of low-calorie intake after bariatric surgery. The exact mechanism for gallstone development in the rapid weight loss period is not fully understood; several explanations have been proposed including increased bile cholesterol saturation and gallbladder stasis, increased secretion of mucin and calcium, and increased prostaglandins(1).

In order to decrease the risk for gallbladder diseases post operatively and gall stones formation, some authors advice prophylactic cholecystectomy (2). But, this has to be managed and resolved as a policy.

The risk of developing gallstones during weight reduction is well accepted (3). Between 10 and 25% of persons who lose weight through very low-calorie dieting develop gallstones (4). In addition, 35-38% of patients develop gallstones as they lose weight after bariatric surgery (5). A routine cholecystectomy during bariatric surgery is recommended by some centers (6), but it may be a difficult procedure with an incidence of complications (7).
Some advice the use of ursodeoxycholic acid which has been shown to be effective only in gastric bypass procedure(8), and in vertical banded gastroplasty(9) but no reports available in case of sleeve gastrectomies.

**Background**

Gallbladder diseases occurring in morbid obese patients, who underwent laparoscopic sleeve gastrectomy (LSG), are of scarce reports and not well established in the Middle East especially in Jordan.

**Aim**

The aim of this study was to define the occurrence of gallbladder diseases in obese patients after laparoscopic sleeve gastrectomy, incidence of gallstones after this restrictive surgery, highlight patients characters; including age, gender, diabetes mellitus, hypertension, hyperlipidemia, and BMI.

**Patients and Methods**

A retrospective review of collected database of 325 patients that underwent LSG in King Hussein Medical Centre and Prince Rashid Military Hospital was reviewed during the period of 1-1-2014 till 1-6-2017. Follow-up abdominal ultrasonography was performed once the patients achieved ¼th of their weight loss, or if develop symptoms related to gallbladder problems, or after 6 months post-surgery. We analyzed all patients who involved in this study since the last 3 1/2 years.

Patients with previous cholecystectomy, preexisting gallstones, gallbladder polyps, or the absence of preoperative abdominal imaging were excluded (Table 1). Follow-up abdominal ultrasonography was performed once the patients achieve ¼ th of his original weight loss, become symptomatic, or yearly post-surgery.

75 patients were excluded (Table 4) for having history of cholecystectomy, gallstone disease, or they refused to share in the study.

Eligible patients (Table 2) were between 17 and 55 years of age and had a BMI of more than 35 kg/m 2 associated with diabetes and/or hypertension and/or other co morbidities.

All patients underwent laboratory tests and physical examinations before surgery, as hormonal assessment, liver and kidney functions, glucose, lipid, vitamins, ultra sound examination, psychiatric and serum ferritin level. Patient’s Informed consent was obtained from each patient before initiation of the study, and hospital ethical committee approval was obtained for the protocol of the study.

**Results**

In our study, a total of 325 patients were analyzed. No difference in number of patients had co morbidities such as diabetes mellitus, joint diseases, ischemic heart diseases and hyperlipidemia. Gallbladder follow-up data were obtained for 250 patients (77%). The median age of the patients was 34years (range 17–55) and the median BMI was 42 (range 35–66). Patients in this study were of female gender (66%) 215 patients, and male gender in (34%) 110 patients. The median follow-up was 2 years (range 1–3 ½ years).(Table 3)

Six(2%) patients had history of cholecystectomy before. 40 (12%) patients had gallbladder problems ,so the preoperative incidence of gallbladder problems were 14%.per operative cholecystectomy at the same procedure during LSG was performed in 30 out of 46 patients with symptomatic cholelithiasis. All surgeries were completed uneventfully. So 16 patients with gallbladder problems did not undergo surgical removal of the gallbladder.

Preoperatively, gallbladder disease was identified in 14% of the patients. Postoperatively 85 patients (26%) developed symptomatic gallbladder problems.65 patients (20%) were due to the presence of gallbladder Stones (12% of them within the first post op. year,and 8% at the remaining post operative follow up period).

The incidence of acute calculus cholecystitis post LSG was calculated at 7%.
A statistically significant increase in % excess weight loss was observed in patients with gallstones (40.4%). and the incidence of symptomatic gallstones was 36% while complicated gallbladder disease occur in 4.4% of the case study.

Percentage of gallbladder problems in the first year postoperatively was 12% (50 patients) which is much higher than that occurring during the remaining 2 ½ years in 8% (20 patients) only in the remaining observed study period.

### Table 1: Incidence of cholecystectomy at intervals after LSG (laparoscopic sleeve gastrectomy).

<table>
<thead>
<tr>
<th>Interval after Lap. Sleeve Gastrectomy</th>
<th>Number of patients with postoperative ultrasounds</th>
<th>Number of patients who underwent cholecystectomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 months</td>
<td>40</td>
<td>11</td>
</tr>
<tr>
<td>6 months</td>
<td>50</td>
<td>5</td>
</tr>
<tr>
<td>12 months</td>
<td>30</td>
<td>6</td>
</tr>
<tr>
<td>18 months</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>24 months</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>30 months</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>36 months</td>
<td>11</td>
<td>22</td>
</tr>
</tbody>
</table>

### Table 2: Outcomes.

<table>
<thead>
<tr>
<th>Symptomatic gallbladder stones</th>
<th>36%</th>
</tr>
</thead>
<tbody>
<tr>
<td>-Complicated gallbladder stones</td>
<td>4.4%</td>
</tr>
</tbody>
</table>
Discussion
Obese patients are at increased risk for gallstones during rapid weight loss and after laparoscopic sleeve gastrectomy. The rate of gallstone formation after gastric bypass is reportedly as high as 52.8% (10). Prophylactic cholecystectomy post bariatric surgery still remains controversial.

We also identify some risk factors. Exclusion criteria of the patients were heavy chocolate eaters, patients’ complaints of peptic ulcer disease and or gastroesophageal reflux, psychiatric disorders and high risk for anesthesia and surgery.

In our study, it is shown that the most important factor related with gallbladder problems is the rapid weight loss duration. It occurred in 30 out of 50 patients (12%) in the first post operative year, in comparison to 30 patients in the following 2 ½ years. There was no clear association between some other risk factors and gallstone formation in our study. In a study conducted by Li et al. (11), postoperative weight loss of more than 25% of original weight was associated with symptomatic gallstone formation.

Some authors (10) suggest that laparoscopic SG does not increase the incidence of symptomatic or complicated gallstones which is different of what is in our study.

Literature review, showed that pre operative cholecystectomy in morbid obese patients programmed for surgery was about 11–23% (12), this is nearly the same to our study group which was 14%. In particular for LSG, Li et al. reported a percentage of 32.79% (13). In our study, (46) of our patients had a preoperative gallbladder disease and 2% (6) patients already had underwent cholecystectomy before. In order to minimize any bias in this study, Laparoscopic sleeve gastrectomy was performed by one single team operating physicians for all the cases.
In this study, 20% developed Gallbladder disease at the first postoperative year, while the remaining 8% of the cases developed over the remaining post-operative follow up periods (remaining 30 months), which indicate that gall bladder disease usually occur at the main first post operative year (post operative weight reduction period).

Those Patients who had symptomatic gallbladder diseases were younger (27 years versus 34 years) than non calculus morbid obese patients, and also had more weight reduction rates than those who did not develop gall bladder disease post operatively. There is no relations between the related co-morbidities as, hypertension or diabetes to the development or association of gall bladder diseases post-LSG.

**Conclusion**

In our study, gall bladder disease occurred mainly at the first post operative year (post operative weight reduction period).

Those Patients who had symptomatic gallbladder diseases were younger (27 years versus 34 years) than non calculus morbid obese patients, and also had more weight reduction rates than those who did not develop gall bladder disease post operatively. There is no relations between the related co-morbidities as, hypertension or diabetes to the development or association of gall bladder diseases post-LSG.

Laparoscopic SG does increase the incidence of symptomatic or complicated gallstones.

**References**