Prophylactic cholecystectomy during laparoscopic sleeve gastrectomy operation

Mohamed Sobhy Teama  
Department of General Surgery, Faculty of Medicine for boys, Al-Azhar University, Cairo, Egypt

Abdelhafez Abdelaziz Selim  
Department of General Surgery, Faculty of Medicine for boys, Al-Azhar University, Cairo, Egypt

Ahmed Hamdy Ahmed Elwakedy  
Department of General Surgery, Faculty of Medicine for boys, Al-Azhar University, Cairo, Egypt

ahmedelwakedy1993@gmail.com

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ORIGINAL ARTICLE

Prophylactic Cholecystectomy During Laparoscopic Sleeve Gastrectomy Operation

Mohamed Sobhy Teama, Abdelhafez Abdelaziz Selim, Ahmed Hamdy Ahmed Elwakedy*

Department of General Surgery, Faculty of Medicine for Boys, Al-Azhar University, Cairo, Egypt

Abstract

Background: One of the biggest issues facing public health is obesity. The World Health Organization considers obesity to be an epidemic in developed nations and is concerned about the toll it has on people’s health, healthcare systems, and economies in general.

Aim and objectives: This prospective case control study’s objective was to assess the frequency of cholelithiasis after laparoscopic sleeve gastrectomy in patients who were morbidly obese and had no prior history of calcular cholecystitis.

Patient and methods: This study a prospective case control study was carried on 100 patients with morbid obesity admitted to alazhar university hospitals and damanhour hospital.

Result: All the patients (100%) discharged in day 1 after the operation. Follow up, of the cases of group B, 6 months after surgery by abdominal ultrasonography revealed that 4 patients (8%) out of the 50 patients have single gall bladder stone but only one of them (2%) is complaining and needs laparoscopic cholecystectomy.

Conclusion: Laparoscopic sleeve gastrectomy is frequently performed as a definitive bariatric procedure worldwide. Prophylactic cholecystectomy during LSG when gallstones are absent is unnecessary, as it easier to perform cholecystectomy and remove of the gall bladder after losing some weight.

Keywords: Bariatric, Cholecystectomy, Cholelithiasis and gall bladder stone, Gastrectomy, Obesity

1. Introduction

One of the biggest issues facing public health is obesity. The World Health Organization considers obesity to be an epidemic in developed nations and is concerned about the toll it has on people’s health, healthcare systems, and economies in general.1 The prevalence of using bariatric surgery as atreatment for morbid obesity is increasing rapidly.2 Every organ system is impacted by obesity, and the associated pathologic processes place a significant financial and health burden on the healthcare system and patients. In the United States, Obesity competes with smoking as the leading cause of preventable death.3 The greatest option for managing obesity is surgery. Currently, surgery is the only effective treatment for attaining long-term sustained weight loss with considerable improvement or resolution of comorbidities and increase in life expectancy. According to the 1991 National Institutes of Health consensus, The most effective treatment for morbid obesity and the illnesses it is linked to is bariatric surgery.4

Acute and chronic cholecystitis, biliary pancreatitis, and symptomatic cholelithiasis (biliary colic), and choledocholithiasis are only a few of the issues that can result from having stones.5 As all health initiatives strive to reduce the prevalence of obesity globally, the incidence of gallstones and consequences connected to gallstones will decline.6

Gallstone symptoms following bariatric surgery are not predicted by the traditional risk factors for gallstone formation in the general population. The only postoperative predictor that can help select patients for postoperative ultrasonography surveillance and ultimately cholecystectomy once gallstones...
have been found is weight loss of more than 25% of original weight. Recently, the majority of researchers have recommended cholecystectomy with gastric bypass only in cases of symptomatic cholelithiasis. However, research suggests that there is a significant difference in the incidence of cholelithiasis, both in terms of symptoms and consequences, following bariatric procedures. The risk of asymptomatic gallstones found before sleeve gastrectomy (LSG) of becoming symptomatic is lower comparing to those formed after weight loss.

This prospective case control study's objective was to assess the frequency of cholelithiasis after laparoscopic sleeve gastrectomy in patients who were morbidly obese and had no prior history of calculcal cholecystitis.

2. Patients and methods

This study a prospective case control study was carried on 100 patients with morbid obesity admitted to alazhar university hospitals and dam-anhour hospital.

Inclusion criteria: Ages between 18 and 65, BMI greater than 40 kg/m2 or 35 kg/m2 with comorbidities, both males and females, and only laparoscopic surgery.

Exclusion criteria: General contraindication for laparoscopy: Previous open extensive surgery in the upper abdomen e.g. splenectomy, respiratory failure, severe congestive heart failure, and unfixable coagulation problems, active alcohol abuse, any previous gastric surgery, patients with acute severe systemic infection, endocrinial disorders and active peptic ulcer disease, patients with previous gall bladder stones prior to operation, patients with previous cholecystectomy prior to operation and absence of preoperative abdominal imaging.

An informed consent was obtained from all participants after explaining the benefits and risks involved.

2.1. Methods

All patients in the present study were subjected to the following.

2.2. Preoperative assessment

Thorough preoperative history taking including: Age and sex, age of onset of obesity, previous trails of conservative weight reduction. History of obesity related comorbidities: Cardiovascular diseases: hypertension and coronary artery disease, diabetes mellitus, dyslipidemia, respiratory system: sleep apnea and obesity hypoventilation syndrome, osteoarthritis, fatty liver, infertility, lower extremity venous stasis disease, urinary stress incontinence and menstrual irregularities. Stress upon the history of calculcal cholecystitis: Symptoms duration, history of acute attacks, history of jaundice and/or cholangitis and history of pancreatitis and past surgical history.

Physical examination: Vital signs, chest, cardiac and abdominal examination, scar of previous upper abdominal incision and trocar scars. BMI calculation: The ratio of weight in kilogrammes to height in metres squared (kg/m2), waist measurement It is measured at around the halfway between the top of the iliac crest and the lower costal border, measured with a tape placed in a horizontal plane at that level. Assessment of common comorbidities: type2 diabetes mellitus (DM), hypertension (HTN), degenerative joint disease (DJD), gastroesophageal reflux disease (GERD) and Obstructive sleep apnea (OSA).

Investigations: Laboratory investigations: Standard laboratory tests include a full blood count, blood urea, blood creatinine, fasting blood sugar, and a full urine analysis. testing for liver function: Plasma liver enzymes (Aspartate Transaminases, Alanine Transaminases), serum alkaline phosphatase and Gamma Glutamyl transpeptidase for selected cases, serum bilirubin (Total and direct), serum albumin, prothrombin (Total and direct), serum albumin, prothrombin time & activity, viral markers (HBsAg and HCV IgG 3rd Gen) and serum TSH, Cortisol level, HBA1C for the group that undergo LSG. Cardiopulmonary evaluation including: Electrocardiograms, echocardiograms, chest X-rays, and testing for respiratory function with ventilatory parameters (inspiratory and expiratory force, respiratory frequency, tidal volume, and minute volume). Imaging: Pelvi-abdominal ultrasound (U/S): Real time abdominal ultrasonography was performed. Computerized tomography (CT) in cases with suspected complications.

Preoperative DVT prophylaxis: Clexane (Enoxaparin sodium: low molecular weight heparin LMWH): 40 mg (4000 IU) subcutaneous injection12 h prior to surgery. All operations were performed under general anesthesia. Conventional laparoscopic cholecystectomy was done before or after sleeve gastrectomy in the same session depending on the surgeons’ preference. However, most of cases in this study underwent cholecystectomy after sleeve gastrectomy.

Intraoperative assessment: Operative time, the need for conversion to open surgery. Intraoperative technical difficulties such as number and
suboptimal port placement, engulfed gallbladder by the large liver making it difficult to dissect laparoscopically, need for extra trocar insertion and intraoperative complications such as bleeding, common bile duct injury, visceral injury, spillage of bile ....etc.

**Postoperative assessment:** Postoperative complications were recorded at time of hospital admission: Assessment of pain: Patients were assessed regarding postoperative pain: employing a VAS, or visual analogue scale, with a range of 0–10, with 10 denoting the most agonising pain. Following surgery, assessments will be performed at 2 and 6 h. Each group will receive a median score for each time measurement. problems from wounds, such as infection, disruption, and sinus formation, and superficial surgical site infection. Need for readmission during the first month following surgery, and the reason. complications unique to laparoscopic cholecystectomy, such as intra-abdominal collections, bile leaks, or injuries to the common bile duct.

**Follow up of the cases:** Follow up for any intraoperative or early postoperative (30 days after the operation) Patients will be checked on at the end of the first, fourth, and sixth weeks following surgery. Examples include pneumonia, bile duct lesions following laparoscopic cholecystectomy, haemorrhage, and abdominal collections, additional procedures and re-admissions. Then followed up after six months by abdominal ultrasonography to determine formation of gallstones or not. Follow up by: Clinical observation of abdominal pain, the color of sclera, asking about the color of urine and stool. Serum bilirubin (total and direct) and Alkaline phosphatase if needed. Us abdomen if clinically suspicion of biliary injury or leakage or collections. Life quality factors include general self-esteem, physical activity, social interactions, job satisfaction, sexual pleasure, and dietary habits.

3. Results

This study was carried out on 100 morbidly obese patients in al-azhar university hospitals and dam-hour hospital. There are 100 patients in the study, divided into two groups: **Group A (the control group):** the 50 patients underwent prophylactic cholecystectomy during laparoscopic sleeve gastrectomy operation. **Group b (the study group):** the 50 patients underwent laparoscopic sleeve gastrectomy operation only Table 1.

In **group A:** 48 females (96%) and 2 males (4%). They were aged from 19 to 65 years old with mean 39.76 years. **In group B:** 45 females (90%) and 5 males (10%). They were aged from 20 to 60 years old with mean 37.28 years Table 2.

Each patient underwent a full physical examination, including an electrocardiogram, echocardiography, and chest X-ray to determine their cardiovascular health and suitability for anaesthesia. All patients signed the consent form and received antibiotic prophylaxis. The reverse Trendelenburg posture with split leg positioning was used for all patients. In **group A:** The operative time ranged from 76 to 121 min, with mean duration 99.16 min **In group B:** The operative time ranged from 64 to 96 min, with mean duration 81.1 min Tables 3 and 4.

Most of the cases reported a higher degree of pain and required much more doses of analgesia Tables 5 and 6.

All the patients (100%) discharged in day 1 after the operation.

### Table 1. Demographic profile of patients.

<table>
<thead>
<tr>
<th>Demographic data</th>
<th>Group A (n = 50)</th>
<th>Group B (n = 50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>Number (%)</td>
<td>Number (%)</td>
</tr>
<tr>
<td>Male</td>
<td>2 (4.0)</td>
<td>5 (10.0)</td>
</tr>
<tr>
<td>Female</td>
<td>48 (96.0)</td>
<td>45 (90.0)</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min.–Max.</td>
<td>19.0–65.0</td>
<td>20.0–60.0</td>
</tr>
<tr>
<td>Mean</td>
<td>39.76</td>
<td>37.28</td>
</tr>
<tr>
<td>Median (IQR)</td>
<td>36.0 (35.0–37.0)</td>
<td>34.0 (34.0–34.0)</td>
</tr>
</tbody>
</table>

### Table 2. Comparison between the two studied groups according to operative time.

<table>
<thead>
<tr>
<th>Operative Time IN Minutes</th>
<th>Group A (n = 50)</th>
<th>Group B (n = 50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min.–Max.</td>
<td>76.0–121.0</td>
<td>64.0–96.0</td>
</tr>
<tr>
<td>Mean</td>
<td>99.16</td>
<td>81.1</td>
</tr>
<tr>
<td>Median (IQR)</td>
<td>96 (96–96)</td>
<td>83 (83–83)</td>
</tr>
</tbody>
</table>

### Table 3. Intraoperative mishaps and Conversion rate.

<table>
<thead>
<tr>
<th>Mishap</th>
<th>Group A (n = 50)</th>
<th>Group B (n = 50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GB rupture</td>
<td>7 (14)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>GB bed bleeding</td>
<td>2 (4)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Splenic capsule injury</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Conversion to open</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Need to extra trocers</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Biliary injury</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Any visceral injury</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
</tr>
</tbody>
</table>

### Table 4. Postoperative pain.

<table>
<thead>
<tr>
<th>Pain score (first day)</th>
<th>Group A (n = 50)</th>
<th>Group B (n = 50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MILD</td>
<td>4 (8)</td>
<td>5 (10)</td>
</tr>
<tr>
<td>MODERATE</td>
<td>34 (68)</td>
<td>35 (70)</td>
</tr>
<tr>
<td>SEVERE</td>
<td>12 (24)</td>
<td>10 (20)</td>
</tr>
</tbody>
</table>
Follow up, of the cases of group B, 6 months after surgery by abdominal ultrasonography revealed that 4 patients (8%) out of the 50 patients have single gall bladder stone but only one of them (2%) is complaining and needs laparoscopic cholecystectomy. Follow up, of the cases of group B, 6 months after surgery by abdominal ultrasonography revealed that 4 patients (8%) out of the 50 patients have single gall bladder stone but only one of them (2%) is complaining and needs laparoscopic cholecystectomy.

4. Discussion

The mainstay of management for morbid obesity is bariatric surgery (BS) with thousands of operations carried out every year. It significantly helps patients lose weight and reduces obesity-related comorbidities, and improves quality of life and survival. Unlike the bypass procedures, it allows an access to the biliary system through the unaltered gastrointestinal pathway, allowing simple ERCP, additional 5-mm trocar was placed in the right upper quadrant. At first, using electrocautery a retrograde cholecystectomy was performed. After completion of cholecystectomy, all patients underwent a standard LSG with five or six trocars.

In the study Coşkun et al. In all patients one additional 5-mm trocar was placed in the right upper quadrant. At first, using electrocautery a retrograde cholecystectomy was performed. After completion of cholecystectomy, all patients underwent a standard LSG with five or six trocars.

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Regarding postoperative surgical complications, no major complications as biliary injury or visceral injury or stricture happened in the current study. While some cases suffered from minor complications, 2 of them in group A had trocar site infection which was treated by antibiotic and dressing. No cases had jaundice or persistent vomiting or DVT or haemorrhage or chest infection or intra-abdominal collection. There was no need for readmission for any of our cases.

In the study Coşkun et al.10 intraoperative mishaps were shown to be unaffected by adding cholecystectomy to bariatric surgery including intraoperative bleeding, leakage, peri-operative fluid and analgesic requirements. There was no conversion to open surgery. Wound infection was seen in one patient and treated with oral antibiotics.

In the study Lee et al.2 With either strategy, there were no intraoperative fatalities.

Two patients in the traditional clipping group required operational bleeding management, and one had postoperative bleeding. One patient in the Glissonian-approach group had postoperative haemorrhage, which was managed conservatively with transfusion. Regarding the postoperative hospital stay: all the patients (100%) discharged in day 1 after the operation.Study Coşkun et al.10 The duration of the hospital stay was not altered by conducting the cholecystectomy concurrently. The mean length of hospital stay was 3.56 ± 0.9 days.

In the study Raziel et al.11 The length of the hospital stay was not altered by conducting the cholecystectomy concurrently. The average hospital stay was two days. No patients in either patient group died. In this study: Follow up of the cases of group B, 6 months after surgery by abdominal ultrasonography revealed that 4 patients(8%) out of the 50 patients have single gall bladder stone but only one of them(2%)is complaining and needed laparoscopic cholecystectomy.

4.1. Conclusion

Around the world, laparoscopic sleeve gastrectomy is regularly done as a permanent bariatric operation. Prophylactic cholecystectomy during LSG when gallstones are absent is unnecessary, as it easier to perform cholecystectomy and remove of the gall bladder after losing some weight.

Consent for publication

I verify that all authors have agreed to submit manuscript.

Availability of data & material

Available.

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Conflicts of interest

There are no conflicts of interest.

References