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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

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* Corresponding author at: Department of General Surgery, Faculty of Medicine for Boys, Al-Azhar University, Resident of General Surgery at Damanhur Educational Hospital, Cairo, Egypt.
E-mail address: ahmedelwakedy1993@gmail.com (A.H.A. Elwakedy).

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have been found is weight loss of more than 25% of original weight.[7]

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.[7]

The risk of asymptomatic gallstones found before sleeve gastrectomy (LSG) of becoming symptomatic is lower comparing to those formed after weight loss.[8]

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.

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 damanhour 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, endocrinal 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 calcular cholicystitis: 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/m^2). 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), gastroeosophageal 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 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 trocer 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 bilary 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 damanhour 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.

Table 1. Demographic profile of patients.

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

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

Operative Time IN Minutes	Group A ($n = 50$)	Group B ($n = 50$)
Min. – Max.	76.0–121.0	64.0–96.0
Mean	99.16	81.1
Median (IQR)	96 (96–96)	83 (83–83)

Table 3. Intraoperative mishaps and Conversion rate.

	Group A ($n = 50$) Number (%)	Group B ($n = 50$) Number (%)
GB rupture	7 (14)	0 (0.0)
GB bed bleeding	2 (4)	0 (0.0)
Splenic capsule injury	0 (0.0)	0 (0.0)
Conversion to open	0 (0.0)	0 (0.0)
Need to extra trochers	0 (0.0)	0 (0.0)
Biliary injury	0 (0.0)	0 (0.0)
Any visceral injury	0 (0.0)	0 (0.0)

Table 4. Postoperative pain.

Pain score (first day)	Group A ($n = 50$) Number (%)	Group B ($n = 50$) Number (%)
MILD	4 (8)	5 (10)
MODERATE	34 (68)	35 (70)
SEVERE	12 (24)	10 (20)

Table 5. Postoperative morbidity.

	Group A ($n = 50$) Number (%)	Group B ($n = 50$) Number (%)
Bile leakage	0 (0)	0 (0.0)
Wound infection	2 (4)	0 (0.0)
Jaundice	0 (0.0)	0 (0.0)
Heamorrge	0 (0.0)	0 (0.0)
DVT	0 (0.0)	0 (0.0)
Persistent vomiting	0 (0.0)	0 (0.0)
Collection Formation	0 (0.0)	0 (0.0)
Chest Infection	0 (0.0)	0 (0.0)
Need to readmission	0 (0.0)	0 (0.0)
Any visceral injury	0 (0.0)	0 (0.0)

Table 6. Hospital stay.

Postoperative hospital stay (days)	Group A ($n = 50$) Number (%)	Group B ($n = 50$) Number (%)
<24 h	0 (0.0)	0 (0.0)
24 h	50 (100.0)	50 (100.0)
Min. – Max.	1.0–1.0	1.0–1.0
Mean	1.0	1.0
Median (IQR)	1.0	1.0

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, when indicated.[9]

There are 100 patients in the study, divided in two groups: **Group A**: the 50 obese patients underwent prophylactic cholecystectomy during laparoscopic sleeve gastrectomy operation (the control group). **Group B:** the 50 obese patients underwent laparoscopic sleeve gastrectomy only (the-study-group).

In this study for goup A, The age was 19.0–65.0 years old with mean 39.76 years. While in group B, The age was 20.0–60.0 years old with mean 37.28 years. Preoperative BMI for group A ranges from 40.0 to 56.40 kg/m^2 with mean 47.268 kg/m^2, while for group B: BMI ranged from 40.0 to 56.20 kg/m^2 with mean 49.06 kg/m^2

These age limits and BMI limits have been standard in this study and in most studies.

Coşkun et al.[10] studied 48 patients. Studied groups include: Group A, 16 patients underwent concomitant LSG and cholecystectomy, and Group B (control group) of 32 patients underwent LSG only. In group A, the mean age was 39.6 ± 10.2 years with mean BMI 51.1 ± 5.6 kg/m^2. While in group B, the mean age was 33.4 ± 10.6 with mean BMI 50.9 ± 5.4 2.57 kg/m^2.

On the other hand, in the study **Raziel et al.**[11] 2708 individuals in total underwent SG. 145 people (5.4%) who had cholecystectomy priors were disqualified. The research group consisted of 180 (7% of the 2563 remaining patients) who underwent LSG and concurrent cholecystectomy and had symptomatic gallbladder disease. The control group consisted of the 2383 patients who remained and had LSG. The age ranged from 22 to 70 years with median age 46 years. The mean BMI was 43.1 kg/m^2.

In the current study, the operative time ranged from 76.0 to 121.0 min with mean duration 99.16 min for group A, while it ranged from 64.0 to 96.0 min with mean duration 81.1 min for group B.

Coşkun et al.[10] had a mean whole operative time (157.2 ± 40.0 min). Mean operative time of Cholecystectomy was 49.1 ± 27.9 min (range 15–110 min) and 108.1 ± 33.3 min for sleeve gastrectomy.

In the study **Raziel et al.**[11] Concomitant cholecystectomy lengthened surgical time by 35 min without affecting hospital stay.

For all cases in our study group, No additional trocars were to complete cholecystectomy during LSG. All patients (100%) underwent their surgery with standard 5 trocars.A slight modification in the position of the epigastric trocar was done. We preferred to do sleeve gastrectomy first on every patient in our trial and cholecystectomy last.

In the study **Coşkun et al.**[10] 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.

No cases suffered from staple-line bleeding after removal of the calibration tube. No conversions to laparotomy were necessary. No biliary nor visceral injury occurred. There was no mortality in our studied patients.

Regarding postoperative pain, Most of the cases reported a higher degree of pain and required much more doses of analgesia.

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 heamorrhge 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

1. Obesity: preventing and managing the global epidemic. Report of a WHO consultation. *World Health Organ Tech Rep Ser*. 2000;894:i-xii:1–253.
2. Lee JH, Han G, Kim YJ, Jung MS, Choi D. A technique for simultaneous cholecystectomy during bariatric surgery. *J Soc Laparoendosc Surg*. 2015;19:4.
3. Schroeder R, Harrison TD, McGraw SL. Treatment of adult obesity with bariatric surgery. *Am Fam Physician*. 2016;93:31–37.
4. Piazza L, Ferrara F, Leanza S, Coco D, Sarva S, Bellia A, et al. Laparoscopic mini-gastric bypass: short-term single-institute experience. *Updates Surg*. 2011;63:239–242.
5. Grover BT, Kothari SN. Biliary issues in the bariatric population. *Surg Clin*. 2014;94:413–425.
6. Bonfrate L, Wang DQ, Garruti G, Portincasa P. Obesity and the risk and prognosis of gallstone disease and pancreatitis. *Best Pract Res Clin Gastroenterol*. 2014;28:623–635.
7. Iglezias C, Adami E, da Silva BB. Impact of rapid weight reduction on risk of cholelithiasis after bariatric surgery. *Obes Surg*. 2003;13:625–628.
8. Conley A, Tarboush M, Manatsathit W, Meguid A, Szpunar S, Hawasli A. Do gallstones found before sleeve gastrectomy behave the same as those formed after surgery due to weight loss? *Am J Surg*. 2016;212(5):931–934.
9. Menenakos E, Stamou KM, Albanopoulos K, Papailiou J, Theodorou D, Leandros E. Laparoscopic sleeve gastrectomy performed with intent to treat morbid obesity: a prospective single-center study of 261 patients with a median follow-up of 1 year. *Obes Surg*. 2010;20:276–282.
10. Coskun H, Hasbahceci M, Bozkurt S, Cipe G, Malya FU, Memmi N, et al. Is concomitant cholecystectomy with laparoscopic sleeve gastrectomy safe? *Turk J Gastroenterol*. 2014;25:624–627.
11. Raziel A, Sakran N, Szold A, Goitein D. Concomitant cholecystectomy during laparoscopic sleeve gastrectomy. *Surg Endosc*. 2015;29:2789–2793.