

Characteristics of morbid obese patients with high-risk cardiac disease undergoing laparoscopic sleeve gastrectomy surgery

ABSTRACT

Introduction: Bariatric surgery is an efficient and safe method of weight reduction among patients who have morbid obesity which cannot be treated by the conservative approach. Safety and feasibility of bariatric surgery among high-risk patients are understudied. Therefore, we aimed to report the patient-level characteristics and outcome among high-risk obese patients undergoing laparoscopic sleeve gastrectomy surgery in Saudi Arabia.

Methods: A retrospective analysis was performed among 13 morbidly obese (BMI >39 kg/m²) patients with high-risk cardiac disease, who were referred to Upper Gastro-Intestinal Surgery Clinic at King Khalid University Hospital, which is a center of excellence in bariatric surgery, for consideration for weight loss surgery. Retrospective data on preoperative weight, height, and BMI, operative details, perioperative complications, length of stay, and information on comorbidities and endocrinal disease were collected for analysis and reporting.

Results: A total of 13 patients were included in the analysis. Of the total, 61.5% were males with a mean age 40.38 (SD: 16.28) and a mean BMI 51.87 (SD: 7.69). The mean duration of surgery was 33.30 min (SD: 31.01), while the mean duration of anesthesia was 83.61 min (SD: 34.73). The mean length of stay was 6.76 days (SD: 3.89). Three patients required postoperative HDU admission with a mean length of stay of 1 day, while 5 patients required postoperative ICU admission with a length of stay ranging from 1 to 3 days. Within 30 days after discharge, only 1 patient required ER visit and none of the patients reported any postoperative morbidity and mortality.

Conclusion: Through this study, we can conclude that laparoscopic sleeve gastrectomy surgery can be considered a safe procedure. However, further studies with a large sample size and a more robust methodology are needed to build upon the findings of this study.

Key words: Bariatric surgery; feasibility; high-risk patients; laparoscopic sleeve gastrectomy; obesity

Introduction

Obesity and overweight are the root cause of many chronic diseases in many high-income, middle-income, and

low-income countries. It is a significant public health concern globally and is considered as one of the leading causes of

Access this article online	
Website: www.saudija.org	Quick Response Code 
DOI: 10.4103/sja.SJA_749_19	

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How to cite this article: BaMehriz F, Alali MN, Arishi H, Abdulfattah F, Alhaizan S, ElDawlatly A, *et al.* Characteristics of morbid obese patients with high-risk cardiac disease undergoing laparoscopic sleeve gastrectomy surgery. *Saudi J Anaesth* 2020;14:182-5.

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Submitted: 27-Nov-2019, **Accepted:** 14-Dec-2019, **Published:** 05-Mar-2020

mortality around the globe. It is reported that more than one-third of the global population are obese and 2.8 million deaths are caused by the problem of increased weight. Obesity is reported as 5%–14% among males and 3%–18% among females in different Gulf countries. A study from Saudi Arabia reported the prevalence of obesity (BMI ≥ 30 kg/m²) and overweight (BMI is between 25.0 and 29.9) as 54.3% among the sample of 1019 from Al Kharj population.^[1-4]

Obesity and overweight are predisposed by certain genetics and environmental factors. Modifiable environmental factors include physical activity, diet, sedentary lifestyle, and other related comorbidities which include various metabolic and endocrinal issues and most commonly cardiac disease and diabetes.^[5] With the advent of science and technology, bariatric surgery has become an efficient and safe method of weight reduction among patients who have morbid obesity which cannot be treated by the conservative approach.^[6] Moreover, bariatric surgery improves the quality of life significantly and improvement in terms of comorbidities has been reported in the literature.^[7] In Saudi Arabia, it is estimated that 15,000 bariatric surgeries are performed annually.^[8]

The literature from western countries reported that, in high-risk obese patients, laparoscopic sleeve gastrectomy surgery appears to have affirmative outcomes in terms of sustained weight loss and comparatively less morbid condition. However, studies have reported that even though the procedure is safe and effective in all kinds of obese patients, this surgery is still associated with high mortality and other perioperative complications.^[9,10] Studies in Saudi Arabia have reported the prevalence of bariatric surgery.^[8,11] However, the safety and feasibility of this surgery among high-risk patients are understudied. Hence, we aimed to report the patient-level characteristics and outcome among high-risk obese patients undergoing laparoscopic sleeve gastrectomy surgery in Saudi Arabia.

Methods

Patients

Under a protocol approved by the Institutional Review Board, a retrospective analysis was performed in 13 morbidly obese (BMI > 39 kg/m²) patients with high-risk cardiac disease, who were referred to Upper Gastro-Intestinal Surgery Clinic at King Khalid University Hospital, which is a center of excellence for obesity surgery, hernia surgery, colorectal surgery, and obesity anesthesia up to date, for consideration for weight loss surgery.

From September 2017 to September 2018, different LSG surgeries were performed in the setting and a total of

13 patients with high-risk cardiac disease were included in this study. Retrospective data on preoperative weight, height, and BMI, operative details, perioperative complications, length of stay, and information on comorbidities and endocrinal disease were collected for analysis and reporting. IRB approval was obtained before the conduct of the study.

Preoperative management

Preoperatively, all patients undergoing LSG were seen in the preanesthesia clinic. History and physical examination were undertaken with special attention to cardiovascular and respiratory systems. History of endocrine diseases like diabetes mellitus and thyroid disorders was also taken. We also recorded the complication of obstructive sleep apnea (OSA). Patients using CPAP were asked to bring their device to the hospital for using it both preoperatively and postoperatively. Any patient with a history of OSA was admitted to the HDU/ICU postoperatively depending on the severity of the disease based on STOPBANG score. Before proceeding with the procedure, laboratory investigations including CBC, urea, electrolytes, and blood coagulation profile were performed. CXR and ECG were also performed, and accordingly, the patient was assigned to specialty for optimizing their condition preoperatively.

Operative technique

Patients were fasting for solids for 8 h and for clear fluids for 2 h preoperatively. Ondansetron/granisetron was given preoperatively. Once the patient admitted to the OR, he/she was connected to noninvasive monitoring, including ECG lead II, blood pressure, and pulse oximetry. Antibiotic was given once the patient entered in the OR. Preoxygenation anesthesia was induced with fentanyl 1 μ g/kg b.w., followed by propofol 2 mg/kg b.w., and tracheal intubation was facilitated with rocuronium 0.6 mg/kg b.w. guided with the TOF monitoring. Maintenance of anesthesia was achieved with 1 MAC sevoflurane or desflurane in a mixture of 50% oxygen in air.

Postoperative management

Postoperatively, all patients were managed according to a standardized postoperative protocol for LSG. Toward the end of surgery, 1 g paracetamol and 16 mg Xefo i.v. were given. Sugammadex 200 mg was given at the end of surgery to reverse the residual muscle relaxation followed by tracheal extubation. After the surgery, patients were sent to the PACU for close observation and otherwise to the HDU/ICU for further observation when indicated. Postoperative pain was managed with i.v. paracetamol and tramadol if needed.

Analysis

All data were analyzed using SPSS version 22. Descriptive analysis was run. Frequency and percentages are reported

for categorical variable while mean and SD are reported for continuous variables. Results are presented in tabular and graphical manner.

Results

A total of 13 patients were included in the analysis. A summary of the results is shown in Table 1. Of the total, 61.5% were males with a mean age 40.38 (SD: 16.28) and a mean BMI 51.87 (SD: 7.69). Only 2 patients had the history of OSA. Of the total included patients, only 1 patient was a current smoker. Regarding chronic condition such as hypertension, 38.5% were hypertensive (7.7% with mild pulmonary hypertension and 7.7% with moderate to severe pulmonary hypertension) and 23.1% were having type-2 diabetes and 15.4% had dyslipidemia and hypothyroidism [Table 1].

Ischemic heart disease was reported in 15.4% of the patients, while right-side heart failure was reported in 7.7% and hypertrophic cardiomyopathy and dilated cardiomyopathy were reported in 15.4% of the patients. Of the total, 7.7% reported severe left ventricular systolic dysfunction and left anterior descending coronary artery bridging. Dextrocardia and aortic valve replacement were not reported by any of the patients. However, chronic heart failure, grade II diastolic dysfunction, and ICD were reported in 15.4% of the patients. Other complications like rheumatic heart disease, RV systolic dysfunction, SP mechanical MVR repair, mild-to-moderate pulmonary valve regurgitation, grade I diastolic dysfunction, elevated RV diastolic pressure, atrial fibrillation, SP tricuspid repair, moderate to severe LV systolic dysfunction, mild aortic stenosis, mild-to-moderate tricuspid regurgitation, mild-to-moderate mitral regurgitation, and mild mitral stenosis were reported in 7.7% of the patients [Table 2].

As per the American Society of Anesthesiologists, 53.8% were classified as class III followed by 30.8% as class IV and 15.4% as class II. The mean duration of surgery was 33.30 min (SD: 31.01), while the mean duration of anesthesia was 83.61 min (SD: 34.73). The mean length of stay was 6.76 days (SD: 3.89). Three patients required postoperative HDU admission with a mean length of stay of 1 day, while 5 patients required postoperative ICU admission with a length of stay ranging from 1 to 3 days. Within 30 days after discharge, only 1 patient required ER visit, and none of the patients reported any postoperative morbidity and mortality [Table 3].

Discussion

Our data suggested that the 13 included obese patients had various comorbidities related to hypertension and other

Table 1: Baseline characteristics and co-morbidities

Characteristics	Frequency and percentage
Gender	
Male	8 (61.5)
Female	5 (38.5)
OSA	
Yes	2 (15.4)
No	11 (84.6)
Smoker	
Yes	1 (7.7)
No	12 (92.3)
Hypertension	
Yes	5 (38.5)
No	8 (61.5)
Diabetes	
Yes	3 (23.1)
No	10 (76.9)
Dyslipidaemia	
Yes	2 (15.4)
No	11 (84.6)
Asthma	
Yes	1 (7.7)
No	12 (92.3)
Hypothyroid	
Yes	11 (84.6)
No	2 (15.4)

Table 2: Summary of cardiovascular conditions

Characteristics	Frequency and percentage*
Mild pulmonary hypertension	1 (7.7)
Congenital pulmonary hypertension	11 (84.6)
Moderate to severe pulmonary hypertension	12 (82.3)
Ischemic heart disease	11 (84.6)
Right side heart failure	12 (82.3)
Hypertrophic cardiomyopathy	11 (84.6)
Dilated cardiomyopathy	11 (84.6)
Severe left ventricular systolic dysfunction	12 (82.3)
Left anterior descending coronary artery bridging	12 (82.3)
Rheumatic heart disease	12 (82.3)
CHF	11 (84.6)
RV systolic dysfunction	12 (82.3)
SP mechanical MVR repair	12 (82.3)
Mild to moderate pulmonary valve regurgitation	12 (82.3)
Grade II diastolic dysfunction	11 (84.6)
Grade I diastolic dysfunction	12 (82.3)
Elevated RV diastolic pressure	12 (82.3)
SP tricuspid repair	12 (82.3)
Moderate to severe LV systolic dysfunction	12 (82.3)
Mild aortic stenosis	12 (82.3)
Mild to moderate tricuspid regurgitation	12 (82.3)
Mild to moderate mitral regurgitation	12 (82.3)
Mild mitral stenosis	12 (82.3)
ICD	11 (84.6)

*Frequencies are reported for patients having underlined cardiac condition

related valvular and cardiovascular conditions. However, postoperative visits were very low compared to the general perception among high-risk patients. The mean length

Table 3: ASA classification and post-operative visit

Characteristics	Frequency and percentage
ASA classification	
II	2 (15.4)
III	7 (53.8)
IV	4 (30.8)
Postoperative ER visit	
No	12 (82.3)
Yes	1 (7.7)

of stay was 6.76 days (SD: 3.89). However, three patients required postoperative HDU admission with a mean length of stay of 1 day, while 5 patients required postoperative ICU admission with a length of stay ranging from 1 to 3 days. Nevertheless, none of the cases experienced perioperative and postoperative death. Our findings suggest that if standard protocols are followed preoperatively, perioperatively, and postoperatively, these surgeries can be performed safely among high-risk patients.

Our findings are inconsistent with the findings of the study conducted among 25 high-risk patients undergoing bariatric surgery which reported that this surgery is safe among high-risk patients undergoing surgery in high volume centers.^[12] However, the mean length of stay in our study was 6.76 days, while in the aforementioned study the mean length of stay was 4.4+/-1.4 days. This could be related to the standard protocol that differs in different countries and could partly be explained by ASA classification; that is, more than half were classified as ASA III, reporting severe disease which limits activity, and therefore these patients could require a prolonged length of stay after the surgery.

Of the total 13 patients, only 1 patient required postoperative ER visit (7.7%). The study conducted in Saudi Arabia investigating readmission rates among 301 patients undergoing bariatric surgery reported readmission rates of 8% and emergency visit of 14%. This study reported higher readmission rates among older patients, with comorbidities like obstructive sleep apnea and dyslipidemia.^[11] As the number of patients was only 13, we were not able to do any advanced statistical analysis to report any differences among the study participants in terms of comorbidities and other demographic variables.

The results of the study should be interpreted with caution as this is the first of its kind and it was conducted on a very small sample. However, we can say that laparoscopic sleeve gastrectomy surgery could be feasible and safe for high-risk patients if done with the standard protocol. Nonetheless, more studies with larger sample size and with a more precise definition of high-risk patients should be conducted

to comment on the feasibility of the surgery among high-risk morbid obese patients.

Conclusion

Through this study, we can conclude that laparoscopic sleeve gastrectomy surgery can be considered a safe procedure. However, further studies with large sample size and a more robust methodology are needed to build upon the findings of this study.

Financial support and sponsorship

The abstract of this study was presented as an e-poster in the annual international congress of SAGES 2019 (Society of American Gastrointestinal and Endoscopic Surgeons 2019).^[13]

Conflicts of interest

There are no conflicts of interest.

References

- Williams EP, Mesidor M, Winters K, Dubbert PM, Wyatt SB. Overweight and obesity: Prevalence, consequences, and causes of a growing public health problem. *Curr Obes Rep* 2015;4:36370.
- World Health Organization. Obesity. Situation and Trends: Global Health Observatory (GHO) data. Available from: http://www.who.int/gho/ncd/risk_factors/obesity_text/en/. [Last accessed on 2017 Feb 01].
- Badran M, Laher I. Obesity in Arabic-speaking countries. *J Obes* 2011;20:9. [PMC free article].
- Al-Ghamdi S, Shubair MM, Aldiab A, Al-Zahrani JM, Aldossari KK, Housseh M, et al. Prevalence of overweight and obesity based on the body mass index; A cross-sectional study in Alkharj, Saudi Arabia. *Lipids Health Dis* 2018;17:134.
- Hruby A, Manson JE, Qi L, Malik VS, Rimm EB, Sun Q, et al. Determinants and consequences of obesity. *Am J Public Health* 2016;106:1656-62.
- Owers CE, Abbas Y, Ackroyd R, Barron N, Khan M. Perioperative optimization of patients undergoing bariatric surgery. *J Obes* 2012;2012:781546.
- Bergeat D, Lechaux D, Ghaina A, Thibault R, Bouyguies V. Postoperative outcomes of laparoscopic bariatric surgery in older obese patients: A matched case-control study. *Obes Surg* 2016;27:1414-22.
- Al-Khaldi Y. Bariatric surgery in Saudi Arabia: The urgent need for standards. *Saudi J Obes* 2016;4:1.
- Thomas H, Agrawal S. Systematic review of obesity surgery mortality risk score—preoperative risk stratification in bariatric surgery. *Obes Surg* 2012;22:1135-40.
- Dresel A, Kuhn JA, McCarty TM. Laparoscopic Roux-en-Y gastric bypass in morbidly obese and super morbidly obese patients. *Am J Surg* 2004;187:230-2.
- Ahmed A, AlBuraikan D, ALMuqbil B, AlJohi W, Alanazi W, AlRasheed B. Readmissions and emergency department visits after bariatric surgery at Saudi Arabian hospital: The rates, reasons, and risk factors. *Obes Facts* 2017;10:432-3.
- Moulla Y, Lyros O, Blüher M, Simon P, Dietrich A. Feasibility and safety of bariatric surgery in high-risk patients: A single-center experience. *J Obes* 2018;2018:7498258.
- 2019 Scientific Session of the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES), Baltimore, Maryland, USA. 2019: 2019 Posters.