

Laparoscopic sleeve gastrectomy in Al-Hilla city hospitals

Gastrectomía en manga laparoscópica en los hospitales de la ciudad de Al-Hilla

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Received: 06/24/2022 Accepted: 08/19/2022 Published: 09/25/2022 DOI: <https://doi.org/10.5281/zenodo.7373168>

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Abstract

Introduction: Obesity is a metabolic illness that shows itself as an extra of unexpended energy stowed as fat. The causal factors include genetic predilection, consumption illnesses, psychological illness, increased food, absence of workout, and comorbid circumstances prompting obesity. The study aims to evaluate some aspects of laparoscopic sleeve gastrectomy, its benefits, and complications for patients with morbid obesity, operated in AL-HILLA city hospitals. Method: Data collected in a prospective Cohort study. LSG was performed for 20 patients for treatment of obesity and included the following demographics: body mass index (BMI, weight in kilograms divided by height in meter square (kg/m^2), hip circumference, waist circumference, serum cholesterol, serum triglyceride, serum low-density lipoprotein, serum high-density lipoprotein, % HbA1c and fasting blood sugar, presence of co-morbidity (e.g. diabetes and hypertension), and complications following surgery. All patients were followed 3 months and 9 months postoperatively. Results: The mean age of patients included in the study was 34.30 ± 5.31 years (23-45 years). The mean weight of patients was 146.70 ± 21.92 kg (115-200 kg). The mean BMI was 51.45 ± 5.65 kg/m^2 (37.5 - 63.8 kg/m^2). The estimated weight loss % EWS was 69% after 9 months. Improvement of co-morbid diseases was significant. Conclusion: LSG is a reasonable procedure for the surgical management of morbid obesity. Hypertension and diabetes mellitus have commonly been reported to occur in the bulk of patients as complications of obesity.

Keywords: Laparoscopic, sleeve gastrectomy, waist circumference, lipid profile, type 2 diabetes mellitus, arterial hypertension.

Resumen

Introducción: La obesidad es una enfermedad metabólica que se manifiesta como un extra de energía no gastada almacenada en forma de grasa. Los factores causales incluyen predilección genética, enfermedades de consumo, enfermedades psicológicas, alimentación aumentada y ausencia de ejercicio y circunstancias comórbidas que conducen a la obesidad. El objetivo del estudio fue evaluar algunos aspectos de la gastrectomía en manga laparoscópica, los beneficios y complicaciones para pacientes con obesidad mórbida operados en los hospitales de la ciudad de AL-HILLA. Método: Datos recogidos en un estudio de Cohorte prospectivo. LSG realizado para 20 pacientes para el tratamiento de la obesidad, que incluyó los siguientes datos demográficos: índice de masa corporal (IMC, peso en kilogramos dividido altura en metros cuadrados (kg/m^2), circunferencia de la cadera, circunferencia de la cintura, colesterol sérico, triglicéridos séricos, lipoproteína de baja densidad sérica, lipoproteína de alta densidad sérica, % HbA1c y glucosa en sangre en ayunas, presencia de comorbilidad (p. ej., diabetes e hipertensión) y complicaciones después de la cirugía. Todos los pacientes fueron seguidos 3 y 9 meses después de la operación. Resultados: la edad media de los pacientes incluidos en el estudio fue de $34,30 \pm 5,31$ años (23-45 años), el peso medio de los pacientes fue de $146,70 \pm 21,92$ kg (115-200 kg), el IMC medio fue de $51,45 \pm 5,65$ kg/m^2 ($37,5$ - $63,8$ kg/m^2). El % de pérdida de peso estimado EWS fue del 69 % después de 9 meses. La mejora de las enfermedades comórbidas fue significativa. Conclusión: la LSG es un procedimiento razonable para el tratamiento quirúrgico de la obesidad mórbida. La hipertensión y la diabetes mellitus constituyen las principales complicaciones de la mayor parte de los pacientes con obesidad.

Palabras clave: Laparoscópica, gastrectomía en manga, perímetro de cintura, perfil lipídico, diabetes mellitus tipo 2, hipertensión arterial.

Obesity is a biological, preventable, and treatable that is a worldwide health concern associated with having an excess amount of body fat. It is caused by genetic and environmental factors and can be difficult to control through dieting alone. Obesity is diagnosed by a healthcare provider and is classified as having a body mass index (BMI) of 30 or greater according to the Centers for Disease Control and Prevention (CDC). The causal factors include family inheritance and genes, consumption illnesses, psychological illness, reduced food, absence of workout, and comorbid circumstances prompting obesity¹. A fat cell is an endocrine cell, adipose tissue secretes a number of metabolites, cytokines, and lipids, and obesity causes increased levels of circulating fatty acids and inflammatory mediators. This process results in an increment of insulin resistance (type 2 diabetes mellitus)^{2,3}.

There are numerous operating methods conceived to lose extra weight and decrease the comorbidities related to obesity. Sleeve gastrectomy (SG) is a restrictive bariatric procedure that was first described as the initial step in biliopancreatic diversion (BPD). Its relative technical ease, effectiveness in weight loss (WL) as a stand-alone procedure, and durability in managing obesity and its comorbid conditions have rendered it the most common bariatric surgery (BS) globally, but is still subject to numerous disagreements⁴. Obesity is still the second leading cause of preventable death in the United States. However, obesity till now is still underappreciated. The American Medical Association waited until the summer of 2013 to confess that obesity is a disease entity⁵. Obesity is a disease and its origin is multifactorial. The mechanisms of the illness include a mixture of environmental and hereditary factors⁶. The first indications for sleeve gastrectomy are afraid "great" obese patients (BMI > 60 kg/m²). Bariatric surgery is done in two discrete operational periods. The first do SG to encourage dependable weight loss, which decreases the anesthetic and practical problems and decreases perioperative morbidity^{7,8}. The malabsorptive step is considered the second step done after 6 months to complete the wanted weight. Technically, easier than other malabsorptive bariatric techniques, results showed fewer complications, an accepted additional weight loss, and significantly low comorbidities^{8,9}. The study aims to evaluate some aspects of laparoscopic sleeve gastrectomy, benefits and complications for morbid obesity patients, operated in AL-HILLA city hospitals.

This study consisted of twenty obese patients on laparoscopic sleeve gastrectomy in the surgical department of AL-HILLA CITY hospitals from January 2019 to December 2019. Body mass index (BMI, weight in kilograms divided by height in square meters (kg/m²), hip circumference (HC), waist circumference (WC), lipid profile (Total cholesterol, triglyceride TG, low-density lipoprotein LDL, high-density lipoprotein HDL), Glycated hemoglobin (HbA1c) and fasting blood sugar (FBS) were performed and recorded for all patients preoperatively, 3 months and 9 months postoperatively, the presence of co-morbidity (e.g diabetes and hypertension) and complications following surgery was assessed. The study is contingent on the rules of the "International Federation for the Surgery of Obesity and Metabolic Disorder (IFSO)" i.e. people with BMI > 40 kg/m² or BMI > 35kg/m² with co-morbidities¹⁰. The exclusion criteria was patients with abnormal thyroid functions test, abnormal renal function, combined LSG with another bariatric procedure result; patients who require suturing of the staple line, patients taking oral anti-lipid medicine before surgery, and patients with poor compliance to follow-up. Statistical analysis of the data was performed with the SPSS 22 statistical package, the data were expressed as percentage and frequency, Chi-Square was used for the assess the association between variables, Pearson correlation test was used for the correlation between continuous data. P-value ≤ 0.05 was consider significant.

The mean age of the patients in this study was 34.30±5.31 yrs. (23-45 years). The mean weight of patients was 146.70±21.92 kg (115- 200 kg). The mean BMI was 51.45±5.65 kg/m² (37.5-63.8 kg/m²). Patient demographics is shown in Table 1.

The estimated weight loss % EWS was 69% after 9 months. BMI difference is the same for smoking, gender, and age. There were 5 smokers (25%) and 15 non-smokers (75%) in the study group, their results regarding BMI are shown in Table 2.

BMI between males and females in the study group is shown in Table 3.

There were 9 patients (45%) >35 years and 11 patients (55%) ≤35 years in the study group, their results regarding BMI are shown in Table 4.

Table 1. The patients' demographics.

Parameter	Preop.	3 months	9 months	P value
BMI (kg/m ²)	51.45±5.65	37.60±4.22	32.45±1.54	0.0080
WC (CM)	144.85±13.77	108.75±14.52	98.96±9.32	0.0411
HC (CM)	141.50±15.65	121.25±12.96	115.24±4.70	0.099
S.T. CHOLESTEROL (mg/dL)	232.65±50.44	200.50±35.76	173.93±9.58	0.259
TG (mg/dL)	146.95±37.67	126.25±29.23	117.76±9.02	0.028
HDL (mg/dL)	34.25±6.83	40±3.44	44.01±0.84	0.044
LDL (mg/dL)	101.10±20.90	92.20±9.83	90.74±0.95	0.072
HbA1c%	7.61±1.24	6.72±0.74	6.15±0.31	0.018
FBS (mg/dL)	140.05±19.49	96.10±5.51	86.26±1.58	0.008

* P- value significant if less than 0.05

Table 2. BMI in smokers and non-smokers.

BMI	Smokers	Non-smokers	p-value
Preoperative	53.4±6.40	50.76±5.46	0.89
3 months	39.7±5.01	36.60±3.88	
9 months	29.68±1.07	31.64±3.36	

* P- value significant if less than 0.05

Table 3. BMI for males and females in the study group.

BMI	MALE	FEMALE	P-VALUE
PREOP.	53.57 ± 4.44	50.30 ± 3.236	0.766
3 MONTHS	40.27 ± 5.00	36.16 ± 3.05	
9 MONTHS	33.54 ± 5.44	31.36 ± 2.59	

* P-value significant if less than 0.05

Table 4. differences in BMI regarding age.

BMI	>35 YEARS	≤35 YEARS	P-VALUE
Preoperation	54.64±5.00	48.26±4.46	0.597
3 MONTHS	40.04±4.58	35.16±1.84	
9 MONTHS	33.08±4.76	29.97±1.44	

* P-value significant if less than 0.05

Postoperative complications are shown in Table 5.

Table 5. post operative complications

complication	No. of pt.
STAPLE LINE LEAK	1/20
STAPLE LINE bleeding	1/20
MESENTERIC ISCHEMIA	1/20
PORTAL VEIN THROMBOSIS	1/20
SUBCUTANEOUS HEMATOMA	1/20
ATELECTASIS	2/20
INTRA-ABDOMINAL ABSCESS	1/20
GASTROESOPHAGEAL REFLUX	1/20

Improvement of the patient's co-morbidities was significant. 7 patients (35%) had diabetes mellitus type 2 (T2DM), only 2 patients were diagnosed with diabetes for more than 5 years, 3 patients were for less than 5 years and the others were diagnosed preoperatively. 6 became

euglycemic within 9 months of surgery. The remaining 1 patient needs a reduction of drug dosage of anti-diabetic medications. There were 9 patients (45%) were diagnosed as hypertensive during the preoperative period. Between them, 2 patients were on more than one antihypertensive agent. Of 9 patients, 7 had completely discontinued their antihypertensive medications within 9 months of surgery and 2 patients were able to reduce the dose of antihypertensive.

Discussion

The advantages of LSG: technically simple process, no internal herniation risk, marginal ulcer¹¹. In our study we noticed significant weight loss with a reduction of BMI with a mean body weight preoperative and 9 months postoperatively was (146.70±21.92) and (91.30±20.54), respectively. The mean BMI preoperative and 9 months postoperatively was (51.45±5.65) and (32.45±1.54), respectively. Excess weight loss (EWL) was 69% after 9 months which seems to be comparable to Bellanger et al.¹² who stated that more than 500 patients without escapes and "EWL 68% at 1 year". Chowbey et al.¹³ stated that no leaks on more than 70 patients with a mean "EWL 59% at 1 year". This may be related to the fact of doing proper sleeve gastrectomy and most of our patients follow our diet instructions postoperatively. Despite the general weight-reducing effects of cigarette smoking, many smokers also have metabolic syndrome, including obesity¹⁴. There was no significant difference between smokers and nonsmokers regarding weight loss and BMI and no significant difference between males and females, patients above 35 years tend to be more obese and have higher BMI than those below 35 years¹⁵ but regarding weight loss and excess BMI loss, we observed no significant difference. In our study 6 patients, out of 7 became euglycemic within 9 months, which represents 85.68%. Abbatini et al.¹⁶ compared LSG and gastric banding in 60 patients with morbid obesity. They obtained a

T2DM resolve rate of 80% for LSG compared with 60% after gastric banding. In our study 9 patients presented hypertension, 7 patients had completely discontinued their antihypertensive medications after 9 months of surgery (77.77%) and 2 patients were able to reduce the dose of antihypertensive. Sarkhosh et al.¹⁷ in their systematic review show that LSG improves or resolves hypertension in almost 75% of patients. The mean levels of pre- and postoperative LDL were 101.10 ± 20.90 and 90.74 ± 0.95 , respectively, and the mean levels of pre- and postoperative HDL were 34.25 ± 6.83 and 44.01 ± 0.84 , respectively. Similar results were obtained by Zhang et al. as in the current study¹⁸ were HDL increased after 1 year of operation, from 48 ± 12 to 54 ± 13 mg/dL ($p < 0.01$), and TG decreased from 141 ± 81 to 109 ± 58 mg/dL ($p < 0.01$). Total Cholesterol and LDL levels after 1 year of operation continue the same, 186 ± 40 and 186 ± 36 mg/dL and 109 ± 35 and 109 ± 30 mg/dL, similarly to Omana et al.¹⁹. In our study leak rate is around 5%, which seems to be high if compared to other studies. This may be attributable to certain main causes first: the use of small-sized bougie 36Fr this will leave a sizable pouch near the angle of Hiss with increased intraluminal pressure, second cause is the type of staplers, we use black (4.5mm) and purple (4mm) staplers instead of a blue one, and finally we think that we still in our early learning curve (bariatric surgery started since 2015 in HILLA hospitals). Cottam et al. performed 126 LSG on patients with BMI 65 kg/m^2 with two leaks (1.4%)⁷, they used blue staplers to be likened with other groups by using 4 – 5 mm staplers on the antrum. Tisseel (fibrin sealant) was used to reduce leaks on staple lines, and they used a large bougie size. Fibrin glue was also used to cover the staple line by Bellanger et al.¹² to cover the staple-line. Although gastroesophageal reflux disease (GERD) was not assessed in this study, it is an expected complication, as preoperative reflux symptoms and esophageal dysmotility are associated with morbid obesity. Only 1 patient presented with gastroesophageal reflux disease (GERD) 7 months postoperatively (5%) best managed with proton pump inhibitors (PPI) in accordance with Himpens et al.²⁰. The intra-peritoneal abscess is an additional conceivable complication. It presents with abdominal pain, fever or nausea, and vomiting. One patient presents with a such condition in our study (5%) probably it develops due to late bleeding which is not drained and get infected or to a minor leak which is not identified by imaging. This was managed conservatively by percutaneous drainage and antibiotics. In a series of 164 LSG, Lalor et al. reported only 1 patient with an abscess (0.7%)²¹⁻²⁴.

Conclusions

LSG is a simple operation for the management of morbid obesity. Hypertension and diabetes mellitus considered complications of obesity commonly occur in many patients.

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