

Laparoscopic Sleeve Gastrectomy, as an Ultimate Intervention for Fatness Treatment, Make Improved Physiological Changes in Obese Patients**Mustafa Erol, Nazim Gures***

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Abstract

Background: Obesity and related comorbidities such as diabetes, coronary heart diseases and non-alcoholic fatty liver are both health and socioeconomically problem worldwide. Determining an appropriate treatment of morbid obesity is a multidisciplinary approach. In recent years, Laparoscopic Sleeve Gastrectomy (LSG) has become the first choice of surgical treatment for the morbid obesity patients resistant to the traditional diet methods, exercise and medications.

Material and methods: We retrospectively analyzed the results of first 100 consecutive cases underwent LSG between January 2015 and January 2016 in our center. Patient demographics (age, gender) were recorded and Patient's body mass indexes (BMI), fasting blood sugar (FBS), Lipid parameter (LDL, HDL) levels, Liver Enzyme (AST, ALT) levels, Blood Pressures and other comorbidities were compared between one week before and after six months of surgery. Surgical complications were also recorded.

Results: BMIs, Levels of FBS, blood pressure, liver enzymes and lipid profile components significantly reduced ($P < 0.05$). Comorbid conditions like hypertension, obstructive sleep apnea, mostly resolved or improved. A case of leakage resulted in pelvic abscess; laparotomy and drainage was performed. Another leakage gave rise to the gastrobronchial fistula which couldn't be corrected by endoscopic methods. Patient finally underwent thoracotomy and lung segmentectomy. One patient had micro anastomotic leak and was observed nonoperatively. No mortality occurred.

Conclusion: Although it may cause some major complications, LSG is effective operation to treat morbid obese patients. Comorbid conditions fastly resolve even within the months, synchronous with the weight loss.

Keywords: Sleeve, Obesity, Series, Laparoscopy, Gastrectomy.*Accepted on January 15, 2017***Introduction**

Gluttony is one of the seven capital sins according to Christian theology. Obesity is now known to be complex result of psychological, endocrinological abnormalities and regarded as chronic, biological, preventable, and treatable disease [1,2]. Obesity decreases the quality of life and life expectancy [3] and bariatric/metabolic surgery has been shown to be the most effective and durable therapy for the treatment of morbid obese patients [4]. Laparoscopic Sleeve Gastrectomy, the current gold standard technique in bariatric surgery, is now a choice for the patients and surgeons worldwide by its superior excess weight loss, low complication rate, and excellent food tolerance, combined with a short hospital stay [5,6].

Herein, we reviewed the short term results of our initial experience with LSG. We also would like to emphasize the applicability of the procedure in a secondary medical center.

Material and Method

In one year period of time, from January 2015 to January 2016, 100 consecutive patients underwent LSG. Of the patients, 64 were female and 36 were male and their ages varied between 21 to 64. All the patients had over 35 BMI and have already been resistant to the diet methods, exercise and medications, were referred by same endocrinologist to the General Surgery Clinic. All the patients were carefully examined by a specialist team consist of General Surgeon, endocrinologist, anaesthesiologist, pulmonologist, psychiatrist and cardiologist before the operation. They were screened preoperatively (Blood Pressure, blood count, routine biochemical tests including lipid profile, fasting blood sugar and chest x-ray). Operations were performed by the same team and the leading surgeon. Operational time was recorded.

Surgical technique

Under general anesthesia, five trocars were inserted: a supraumbilical 12 mm optical, two 5/12 mm right and left superolateral to the umbilicus and two 5 mm epigastric (Figure

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1). Liberalization of the greater curvature was carried out upwards, starting from the point of 4 cm superior to the pylorus up to the left crura. A 36 F tube was inserted from the mouth to mark the stapler line. Endo GIA (Gastrointestinal Anastomosis Stapler) was used for the longitudinal stapling of the greater curvature towards to Angle of His. Specimen was retracted from the abdomen through 12 mm trocar (Figure 2).

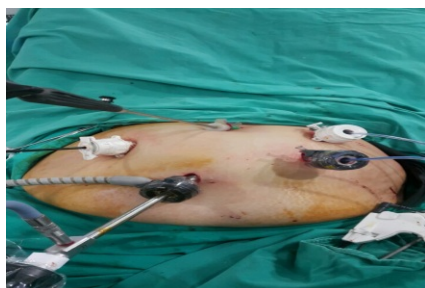


Figure 1. Port Placement

Postoperative follow-up

Patients were observed in the Intensive Care Unit on the day of Surgery. Oral liquids were started on postoperative day two. After the patients were able to tolerate soft foods they were discharged. They were called to our outpatient clinic for the follow-up program by the periods of 10 days, 1 month, 3 months and 6 months after surgery. Routine biochemical tests and patient's actual weights were also registered during these visits. In this study, results of the 6 month's tests and BMI's were compared to the results prior to the surgery. The patients were also questioned for the severity of the obesity-related symptoms (joint pains, sleep apnea, etc) that they had before the surgery.



Figure 2. Surgical Specimen

Statistical analysis

In order to compare means, paired-sample t-test, using the SPSS, Version 19 (Chicago, IL) was used.

Results

The mean age of the male patients was 36.1 ± 12 and female patients were 33.2 ± 11 . Mean BMI of the males was higher than the females (Table 1, Demographic Data).

Table 1. Patient's Demographics

Variable	Female	Male	p
Patient	64	36	
Age (mean+SD)	36.1 ± 12	36.1 ± 12	0.657
BMI (mean+SD)	47.1 ± 4	47.1 ± 4	0.426

*Statistical significance: $p < 0.05$ is considered statistically significant.

SD: Standard Deviation, BMI: Body Mass Index

Serum levels of all the parameters (FBS, LDL, HDL, AST and ALT levels) were measured in an automated system by using commercially available kits (Cobas system, Roche Diagnostics, Mannheim, Germany). All the biochemical values (FBS, LDL, HDL, TG, AST, ALT) reduced at the end of the six months when compared to baseline values (Table 2). Patients weights and BMI's are also significantly lower than the baseline ($P < 0.05$) (Table 3).

Table 2. Biochemical Values (mean+SD)

	Baseline	6 months After Surgery	P
FBS	102.6 ± 12.3	86 ± 9.6	0.0001*
LDL	132.2 ± 24.2	108 ± 18.8	0.0001*
HDL	40.3 ± 7.2	45.6 ± 6.4	0.001*
TG	190.2 ± 70.2	132.6 ± 47.7	0.0001*
ALT	38.9 ± 8.9	27.9 ± 5.7	0.0001*
AST	28.6 ± 8.3	21.1 ± 5.9	0.0001*

*Statistical significance. $p < 0.05$ is considered statistically significant.

FBS: Fasting Blood Sugar; LDL: Low Density Lipoprotein; HDL: High Density Lipoprotein; TG: Triglyceride; AST: Aspartate Transaminase ALT: Alanine Transaminase

Table 3. BMI Alterations (mean + SD)

	Baseline	6 months	p
BMI Alterations (mean + SD)	45.6 ± 4.5	30.4 ± 5.2	

EWL (excess weight loss) of the patients at the end of the six months $65.3 \pm 18.3\%$ (mean \pm SD)

Median operative time is 55 minutes (range 35 to 120 min)

Comorbid conditions mostly resolved, at least improved at the end of the six months (Table 4).

Table 4. Comorbidities (number of patients)

	Postoperative			
	Preoperative	Resolved	Improved	Unchanged
Hypertension	40	32	8	0
Type 2 Diabetes Mellitus/Insulin Dependent	10/6	6/2	4/3	0/1
Obstructive Sleep Apnea	12	12	0	0
Depression / Anxiety	15	2	10	3
Knee / Hip Pain	22	6	16	0

Two major complications occurred. A pelvic abscess was seen after 35 days of surgery and laparotomy and drainage needed for this patient. Another case presented with a gastrobronchial fistula underwent lung segmentectomy after endobronchial stenting attempts failed. One patient had microanastomotic leak treated with antibiotics and cessation of oral intake and leak regressed nonoperatively (Table 5).

Table 5. Surgical Complications

	Number of Patients	Result
Pelvic Abscess	1	Laparotomy + Drenaige
Gastrobronchial Fistula	1	Lung Segmentectomy
Microanostomotic Leak	1	Nonoperative Treatment

Discussion

Today, Bariatric surgery is known the most effective and durable therapy for the treatment of morbid obese patients. Among the bariatric surgery procedures, LSG, is becoming the leading bariatric surgery procedure, because of its simplicity and efficacy [4,5].

While starting, we knew that the learning curve of 50-100 cases for gaining proficiency and reducing the complication rates for laparoscopic bariatric surgery was suggested in the literature [7]. We are agreeing that to be familiarized with the laparoscopic surgery is also essential before starting the procedure. Particularly, laparoscopic manipulation skills and experience is crucial to have good result in superobese patient group (BMI>60). Operational time significantly reduced from almost two hours for the first case to even 35 minutes for some cases by the time and experience.

Our six-months follow-up results are compatible with the literature [3,4,6-9]; FBS, lipid disturbance, liver function tests were all improved. Lemanu et al. reported FBS and related HbA1c had been significantly reduced after 5 years-long term follow-up. Studies support the decrease of the LDL and Total Cholesterol levels; but the effect seems limited by the long term

[11,12]. Yildiz et al. urged the effects of LSG on the non-western population and they founded that LSG is highly efficient to ameliorate the hypertension, hyperlipidemia, and diabetes mellitus [13]. The fact that, there is a study from Iran made up of short outcomes of their LSG series which has very similar results with our patient group [14] may be raised from the close relationship, genetic pool and eating habits between neighboring two countries. Two-years follow-up study from Greece, another neighboring country of Turkey, exhibits that diabetes mellitus, hypertension, and hyperlipidemia were diminished gradually at 6 months postoperatively, as well [15].

Stress and depressive symptoms were also lessened almost all of the patients suffered [16,17]. They felt more reconciled with their body image. Losing weight leads to increasing activity of the patient that means more serotonin production [18].

Interestingly, all the patients with obstructive sleep apnea symptoms quit to use Continuous Positive Airway Pressure (CPAP) and described better sleep quality, even within 6 months harmonious with the weight loss [19]. LSG is also effective treatment to relieve joint pain which is prominent on the large joints as hip and knee [20].

Postoperative leakage ranges in the literature between 1.1 and 5.3% [21] but an Israeli study reported as low as 0.83% in their 3003 cases series [22]. They also reported only one case of intraabdominal abscess that is already one in our series. Staple line reinforcement (SLR) is reported superior to no enforcement [23]; hence, we preferred SLR for our patients. Endobronchial fistula is a quite rare complication of LSG and surgical intervention might be needed [24].

Conclusion

LSG seems very effective weight loss treatment even within the short period after the surgery. Besides improvement in biochemical parameters, resolution of comorbid conditions of the patients can be striking. Increasing self-confidence and social activity of the patients another point that can easily be realized while their routine out-patient clinic controls. We also concluded that LSG can be feasible surgical procedure for a secondary health care hospital's general surgery clinic with

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careful preoperative and postoperative evaluation of the patients.

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