



## Assessment of Excess body weight loss and Operative Time among conventional and Three ports sleeve gastrectomy Groups

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### Abstract

**Background:** Bariatric surgery is a treatment for morbid obesity. Different surgical procedures have been described in order to obtain excess weight loss (EWL), but currently laparoscopic sleeve gastrectomy is the most commonly performed procedure throughout the world.

**Aim:** Assessment of Excess body weight loss and Operative Time among conventional and Three ports sleeve gastrectomy Groups.

**Methods:** A prospectively constructed database of patients who underwent 3PSG (group 1) and conventional LSG (group 2), each containing 50 patients after application of the inclusion and exclusion criteria, was retrospectively analyzed.

**Results:** Mean Operative Time was longer in group 1 than in group 2 ( $50 \pm 4.38$  min vs.  $46.04 \pm 3.64$  min,  $p < 0.001$ ). The mean EBWL% in 3PSG, one of the most important parameters for evaluating the efficacy of a bariatric procedure was similar to that of conventional LSG. Mean EBWL% after 6 months was  $49.62 \pm 2.91$  &  $49.94 \pm 3.41$  in group 1 and 2 respectively with p value of 0.614

**Conclusion:** Three-trocar sleeve gastrectomy can be safely carried out with a slight increase in operative time

**Keywords:** Bariatric surgery, Conventional, Three ports sleeve gastrectomy

### Introduction

Morbid obesity is a globally increasing health problem which impacts all age groups, races, and countries. It is a chronic disease associated with a variety of comorbidities such as diabetes, hypertension, coronary heart disease, and obstructive sleep apnea. Bariatric surgery is currently considered the most effective treatment option for morbid obesity. Not only does it provide a better quality of life, but there is also scientific evidence demonstrating increased long-term survival in patients who have undergone the surgery.

(1)

Different surgical procedures have been described in order to obtain excess weight loss (EWL). Currently, operative patterns show a progressive decline in laparoscopic adjustable gastric banding (LAGB), and an increase in procedures such as Roux-en-Y gastric bypass (RYGBP) and laparoscopic sleeve gastrectomy (LSG). (2)

LSG was first described by Regan et al. as a part of a multi-step approach in super obese patients due to the technical difficulties in performing the RYGBP. (3)

Laparoscopic three port-sleeve gastrectomy (3PSG) has been recently described as a promising alternative between the standard LSG and SILS sleeve gastrectomy (SILS-SG). (4)

This study aimed for Assessment of Excess body weight loss and Operative Time among conventional and Three ports sleeve gastrectomy Groups.

## **Subjects and Methods:**

From August 2019 to January 2021, 100 patients from our institution Kasr Al Ainy medical school, bariatric surgery department were enrolled in the trial after approval from the institutional review board. Each patient was evaluated by a multidisciplinary team before surgery (nutritionist, endocrinologist, psychiatrist, anesthesiologist, and bariatric surgeon). The indication for sleeve gastrectomy was given following the recommended indications of the International Federation for the Surgery of Obesity (IFSO) by all specialists involved. For the bariatric surgeon, the indications were a body mass index (BMI) >40 or >35 kg/m<sup>2</sup> with the at least one comorbidity, and patient age between 18 and 60 years.

### **Inclusion criteria:**

Morbidly obese patients with BMI  $\geq 40$  or  $\geq 35$  with one or more comorbidity.

### **Exclusion criteria:**

Patients with a history of previous abdominal surgery.

Planned simultaneous abdominal surgery e.g. cholecystectomy.

### **Methodology:**

Hundred patients scheduled for sleeve gastrectomy were evaluated for eligibility to the study. The patients have been randomized, using web-based computer randomization in a 1:1 ratio, into two groups: 3PSG (group 1) and conventional LSG (group 2). The volunteers have been informed the day before surgery that surgery could be performed using three or five trocars, and that additional trocars could be used if needed during the surgery. Informed consent were obtained from all individual participants included in the study. The patients have been blinded until the dressings are changed on the first postoperative day. All surgeries were performed by the same experienced bariatric surgeon.

We compared between the two techniques regarding operative time, percentage of excess body weight loss (EBWL %) at 6 months post-surgery.

### **Operative Techniques:**

All procedures were performed in the reverse Trendelenburg and French positions, in which the surgeon stands between legs of the patient. In the conventional LSG, the five-trocar approach is used. Veress needle at Palmer's point is used to achieve pneumoperitoneum. The upper pressure limit for CO<sub>2</sub> pneumoperitoneum is set as 14 mmHg. The first trocar, with a diameter of 12 mm, have been placed in the upper abdomen, 15–20 cm below xiphisternum. It have been used for the camera. A 5 mm trocar is positioned at the subxiphoid area for the insertion of the liver retractor to lift the left lobe of the liver and obtain an optimal view of the stomach. Twelve millimeter trocars have been placed in the left and right upper quadrants as working channels. In the conventional LSG, they are placed on both upper quadrants so that the stapler could reach the target organ on a linear line. If optimal visualization could not be achieved because of the abdominal fat tissue, one 5 mm trocar is placed to the left subcostal anterior axillary line to retract the omental tissues and the resected part of the stomach to ease the placement of the stapler.

In 3PSG, the setup and positioning are the same as the conventional LSG, but subxiphoid trocar will not be used. To provide a clear view without liver retractor, the surgeon retracts the greater curvature of stomach upwards and medially during the dissection of gastrosplenic ligament. Then retracted upwards, medially and caudally during the dissection of gastrophrenic ligament. If optimal visualization could not be achieved because of a hypertrophic left liver lobe, it will be internally suspended using suture traction between the right diaphragmatic crus and the anterior abdominal wall or retraction by a veress needle. If feasible, optical trocar for camera (5 mm) is placed at the umbilicus and one of the two working trocar can be 5mm (at the left upper quadrant).

We pass the 36 French bougie down the esophagus along the lesser curvature of the stomach and into the pylorus. A green load (Ethicon ECHELON ENDOPATH) of the stapler is then applied about 4 cm from the pylorus parallel to the lesser curvature and then multiple gold and blue loads (Ethicon ECHELON

ENDOPATH) are applied parallel to the bougie up till 1 cm from the angle of Hiss. Oversewing of staple line is done. Hemostasis was confirmed. Methylene blue test was performed routinely. No drain was placed. The resected stomach was removed via the 12 mm right and left quadrant trocar incisions in group 1 and group 2, respectively.

The fascia of the openings was not closed. The incisions were sutured with VicrylRapide 3/0 two-layers (subcutaneous tissue and skin).

**Operative Time Definition:**

Operative time counting started with Veress needle introduction and was finished with the last trocar skin wound closure.

**Statistical analysis:**

Data were coded and entered using the statistical package for the Social Sciences (SPSS) version 26 (IBM Corp., Armonk, NY, USA). Data was summarized using mean and standard deviation for quantitative variables and frequencies (number of cases) and relative frequencies (percentages) for categorical variables. Comparisons between groups were done using unpaired t test. For comparing categorical data, Chi square test was performed. Exact test was used instead when the expected frequency is less than 5. P-values less than 0.05 were considered as statistically significant.

**Results**

**Demographic distribution of patients**

This study included 100 patients, divided into 2 groups: 3PSG (group 1) and conventional LSG (group 2), each containing 50 patients.

	<i>Group 1 (n=50)</i>	<i>Group 2 (n=50)</i>	<i>P value</i>
<b>Demographics</b>			
Male to female ratio	21/29	20/30	0.839
Mean age (years)	34±8.07	33.06±7.69	0.569
Mean BMI (kg/m <sup>2</sup> )	45.2±4.95	45.3±4.81	0.919

**Table 1: Patients' General Characteristics**

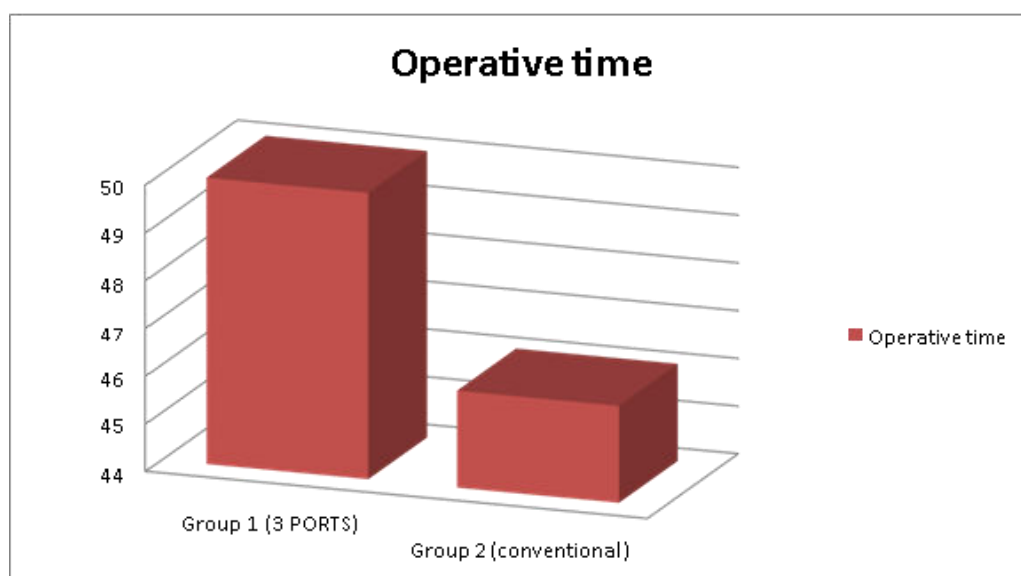
Table 1 summarizes the general characteristics of the patients of the study. Male-to-female ratios were 21:29 and 20:30 in group 1 and group 2, respectively ( $p > 0.05$ ). Mean age was 34±8.07 years old in group 1 and 33.06 ± 7.69 in group 2 ( $p > 0.05$ ). Mean preoperative BMI were 45.2 ± 4.95 kg/m<sup>2</sup> and 45.3 ± 4.81 kg/m<sup>2</sup> in group 1 and group 2, respectively ( $p > 0.05$ ).

**Table 1: Patients' General Characteristics**

	Group1(n=50)	Group2(n=50)	Pvalue
<b>Outcomes</b>			
Mean operation time (min)	50±4.38	46.04±3.64	<0.001
Mean EBWL% 6 months	49.62±2.91	49.94±3.41	0.614

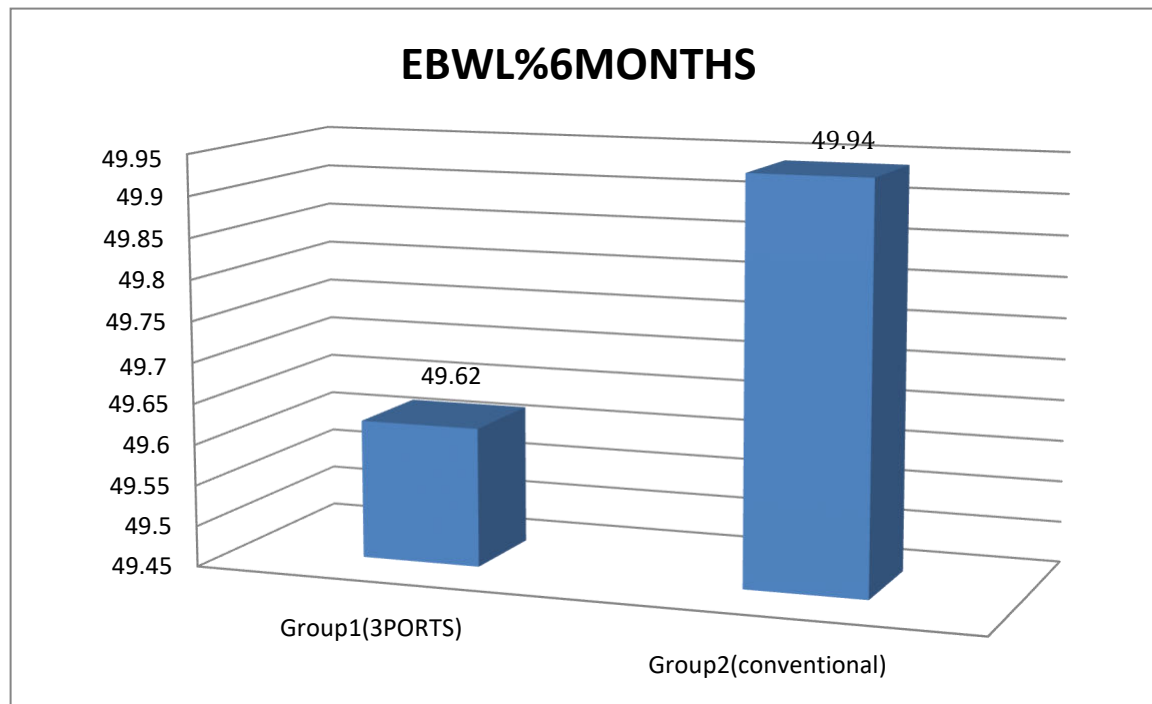
BMI, body mass index; %EBWL, excess body weight loss percentage

The median VAS was 3.38±1.38 and 3.68±1.45 in group 1 & 2 respectively. There was no statistically significant difference ( $p > 0.05$ ).



**Fig 1: operative time in 3PSG & conventional sleeve gastrectomy**

The mean EBWL% in 3PSG, one of the most important parameters for evaluating the efficacy of a bariatric procedure was similar to that of conventional LSG. Mean EBWL% after 6 months was 49.62±2.91 & 49.94±3.41 in group 1 and 2 respectively with  $p$  value of 0.614



**Fig 2: EBWL % in 3PSG & conventional sleeve gastrectomy**

## Discussion

Bariatric surgery has been proved as the most effective treatment of obesity and related comorbidities. Sleeve gastrectomy was initially used as a restrictive component of a more complex intervention in 1998 by Hess. It has since become a definitive procedure for the treatment of morbid obesity. Nowadays, LSG is the most frequently performed procedure in Turkey, the United States, Canada, and the Asia/Pacific regions.

(5)

It is generally performed using four to six skin incisions for the placement of trocars. Reducing the number of trocars has become a target for minimally invasive surgery. Even though SILS-SG has been proposed as safe and effective with good early postoperative results and less wound-related complications, navigating the complex instruments and achieving triangulation can be challenging for inexperienced surgeons. Therefore, SILS-SG can be more difficult than conventional LSG. (6)

**Arru et al.** described a 3PSG technique, which was between conventional LSG and SILS-SG. They reported a mean OT of 72 min (range, 50–110) in a small prospective study, including 25 patients with BMI >50 kg/m<sup>2</sup>, who were followed for 3 months. (4)

Recently, **Consalvo et al.** reported a randomized controlled trial comparing 3PSG and conventional LSG on 82 patients. Intra-operative time was shorter for the classical sleeve gastrectomy (43.1 ± 8.5 min with a range of 30–66 min) compared to the three-trocar technique (51.5 ± 10.53 min with a range of 35–71 min).

(7)

In contrast to the study of **Kianmajd et al.** that explores 247 sleeve gastrectomy cases, comparing one surgeon's operative times in a single institution over two years to show the feasibility of using three ports. In comparison with five ports, we have found a reduction in operating time when utilizing only three ports for laparoscopic sleeve gastrectomy (70–76 min) & (52–63 min.) respectively. (8)

**Kirkil et al.** reported a prospectively controlled study of patients who underwent 3PSG (group 1) and conventional LSG (group 2), each containing 70 patients. The mean OT of the 3PSG group was (47.2 ± 8.9) min, significantly higher than for the other group (40.7 ± 7.5) min, but it was still comparable with the available conventional LSG data. (9)

In our prospective randomized controlled trial on patients who underwent 3PSG (group 1) and conventional LSG (group 2), each containing 50 patients. Mean operation time was longer in group 1 than in group 2 (50 ± 4.3 min vs. 46.04 ± 3.6 min, p < 0.001).

With regard to the excess weight loss and its effect on comorbidities, Arru et al found that there were no differences when compared with the results obtained with standard LSG. (4)

Kirkil et al. reported that the mean %EBMIL in 3PSG, one of the most important parameters for evaluating the efficacy of a bariatric procedure, was similar to that of conventional LSG. (9)

In our study, the mean EBWL% in 3PSG, one of the most important parameters for evaluating the efficacy of a bariatric procedure was similar to that of conventional LSG. Mean EBWL% after 6 months was  $49.62 \pm 2.91$  &  $49.94 \pm 3.41$  in group 1 and 2 respectively with p value of 0.614

## Conclusion

3PSG is a feasible technique without affecting EBMIL rates. Three-trocar sleeve gastrectomy can be safely carried out with a slight increase in operative time.

**Conflicts of Interest:** The authors declare no conflict of interest.

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