

## Gastric Sleeve analysis as a surgical treatment for obesity

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**Submitted:** 10 Aug 2018; **Accepted:** 25 Aug 2018; **Published:** 20 Sep 2018**Summary**

**Introduction:** Obesity is defined as the abnormal or excessive accumulation of fat that can be harmful to health. It is estimated that about 10 million people are severely obese in Mexico. Gastric Sleeve (GS) is the main procedure performed worldwide and has shown excellent results in treating obesity.

**Materials and Methods:** This is a retrospective study carried out by "Gastric Bypass Mexico" medical group from 2014 to 2016, where records of 1,030 patients who underwent a GS by 3 surgeons under the same technique were reviewed; Patients who were not approved by the multidisciplinary team were excluded.

**Results:** A total of 1,032 surgeries were performed, 814 (79.03%) to women; the averages are: age - 35.01 years old; BMI 40.16Kg / m<sup>2</sup> (30-90.56 kg / m<sup>2</sup>); intrahospital stay 1.11 (1-5) days; surgical time 20.01 (15-35) minutes, anesthetic time 37.50 (30-102) minutes. The mortality rate was 0% and the complications percentage was 3.20% (33): 20 (1.94%) patients had bleeding, of which 7 (35%) required a globular package transfusion (1-3 units); 10 (0.97%) patients had an infection in a surgical wound, 2 (0.19%) had gastropleural fistula and 1 (0.97%) patient had a gastric leak.

**Discussion:** A GS is a safe and effective procedure for treating and controlling obesity. Compared to other techniques, a GS involves reduced anesthetic and surgical time, and offers short stays in the hospital.

**Conclusions:** A GS offers excellent weight loss results, with a low morbidity and mortality rate.

**Keywords:** Gastric Sleeve, Bariatric Surgery, Obesity.

**Introduction**

Obesity is defined as the abnormal or excessive accumulation of fat that can be harmful to health. The Body Mass Index (BMI) is a simple pointer used to identify overweight and obesity in adults. The World Health Organization defines obesity in adults as the following: BMI equal to or greater than 30Kg / m<sup>2</sup> [1, 2]. This is a conical disease, of a multifactorial nature, with an increasing prevalence in the world being the second cause of predictable death, after smoking. And great relevance in the world economy [3-6]. The main cause relies on changing the lifestyle of modern society, which has generated a huge unbalance between the consumption and use of energy, the development of large quantity and variety of industrial foods with a high caloric density, the enormous increase of sedentary lifestyle and less physical activity [7]. Obesity currently represents a major public health issue that has a serious impact on several countries' economy, it is associated with premature mortality, chronic morbidity, an increased use of health services, life quality deterioration and social stigmatization [2, 8, 9]; It has become a true epidemic of the 21st century and integrates what is known as the civilization syndrome, so the World Health Organization now considers obesity as a global epidemic [1, 10, 11]. The prevalence of obese patients has severely increased becoming a serious public

health issue [7]. It is estimated that in Mexico about 10 million people are severely obese [4, 6].

Fat is a toxic factor which increases the fragility of these patients [12]; Obese people suffer from an increased risk of presenting multiple comorbidities such as high blood pressure, diabetes mellitus, dyslipidemia, heart failure, venous insufficiency, stroke, gout, COPD, coronary heart disease, obstructive sleep apnea, osteoarthritis, development of insulin resistance, osteoarticular diseases, mood disorders, substance abuse, depression, anxiety, reproductive disorders and cancer, which diminishes the quality and life expectancy [4, 6, 8, 10, 13].

The effectiveness of dietary, pharmacological and behavioral treatment in morbid obesity is limited, so bariatric surgery emerges as an option for these patients [8, 14]. Since it is proven that this treatment can loss up to 83% of the weight within of the first year in addition to reducing comorbidities in 40% in 10 years (56% of myocardial infarction, 92% for diabetes and 60% for cancer) [13, 15, 16].

Laparoscopic vertical gastrectomy, or GS, is the most recent bariatric surgical procedure for obesity control and stands out for being fast and safe [2, 17- 20]. In 2012, the American Society for Bariatric

and Metabolic Surgery published a consensus in which it affirms that a GS is a valid alternative to a Gastric Bypass, and has now demonstrated its effectiveness as an independent procedure for the treatment of morbid obesity [8, 21, 22]. The Vertical Sleeve Gastrectomy was first described in 1988 by Dr. Scopinaro [11, 17]. The GS consists of a gastric resection of approximately 70-80% that leaves a narrow tube of limited volumetric capacity in the minor curvature which limits the stomach's discharge, meanwhile the integrity of structures such as duodenum, pylorus, antrum, minor curvature and vagus nerves, create a moderate restriction allowing a relatively normal eating behavior [11, 17, 23-25]. MG is not only a restrictive procedure due to a decrease in food intake secondary to gastric resection, since it also has a strong hormonal component because when the gastric fundus is almost completely resected, the production of the orexigenic and adipogenic hormones is reduced. Called ghrelin (appetite regulating hormone) produced mostly in cells found in this site, which has an impact on increased gastric emptying, intestinal motility, changes in carbohydrate metabolism and loss of appetite; these two components have good results both in weight loss and in the control of comorbid phenomena [6-8, 10, 26, 27]. A GS is not only a restrictive procedure due to the decrease in food intake secondary to the gastric resection, since it also has a strong hormonal component, because when the gastric fundus is almost completely resected, the production of the orexigenic and adipogenic hormones is reduced, which is known as ghrelin (appetite regulating hormone) produced mostly in cells found in this area, which has an impact on increasing the gastric evacuation, intestinal motility, changes in carbohydrate metabolism and loss of appetite; these two components have good results both in weight loss and in the control of comorbid phenomena [6-8, 10, 26, 27]. It is estimated that only 1% of eligible patients undergo the surgery. The cause of this may be the false notion of unacceptable risks and high rate of associated complications [13]. A GS is a short time effective bariatric procedure, relatively safe since it is estimated that mortality rate for this bariatric surgery is less than 1% in reference centers, 5 to 10% of patients have acute complications and 9 to 25% late complications, patients also have a quick recovery [6, 12].

## Materials And Methods

Retrospective and descriptive case study; It was carried out by the medical group at "Gastric Bypass Mexico" in Guadalajara, Jal. Mexico from 2014 to 2016. We reviewed records of 1,032 patients diagnosed with morbid obesity who underwent Vertical Gastrectomy in Laparoscopic Sleeve, under the same surgical technique.

The indications for the intervention meet the criteria for Mexico's "Clinical Practice Guideline - Surgical Treatment of Morbid Obesity", which were carried out with the due pre-operative care by the multidisciplinary team, also variables such as gender, age and BMI, surgical time, days of hospital stay, complications and deaths.

The preoperative study case consisted of clinical analysis and a complete multidisciplinary assessment; Patients who were not approved by this team were excluded.

## Surgical Technique

General anesthesia, asepsis and antisepsis of the abdominal region and reversed Trendelenburg position. Ethicon Endosurgery ports, Cincinnati, OH Endopath Xce Bladeless Trocars were used, which were placed as follows: The first port of 12 mm supraumbilical, to the left of the midline to 15 cm below the rib cage with an open technique, insufflating with CO<sub>2</sub> to obtain a pneumoperitoneum of 15 mmHg. The port for the 12 mm camera to the right of the midline in the middle of the distance between the xiphoid appendix and the umbilical scar. The port for the Surgeon's left hand is 5 mm left subcostal. The port for subxifoid hepatic retractor is of 5 or 10 mm. One or two ports of 5 mm for the first assistant, the first left subcostal at the level of the anterior axillary line, and the additional port, if required, 10 cm below the previous one.

The liver is retracted in a cephalad orientation with a 10 mm blunt rod. Using a harmonic scalpel, the dissection of the greater curvature between 2 and 5 cm proximal to the pylorus is performed, until the angle of His and the left pillar are identified and dissected. Afterwards, a 32-36 Fr orogastric tube is placed in the minor curvature to the pylorus, to calibrate the gastric resection. Between 2 and 5 cm of the pylorus, the gastric resection is done with stapler (Echelon 60 mm Endopath with golden cartridge 3.8 mm) up to the angle of His. In average, between 5 and 6 cartridges are used to obtain a gastric reservoir with a capacity of 50 to 60 ml. In case of a revision surgery we use a green cartridge of 4.1 mm. In case the staple line has bleeding during the revision surgery, we reinforce the line of staples with monocryl suture 2 zeros (Ethicon). The hermeticity is checked with blue methylene, and the surgical piece is extracted through the port of the surgeon's right hand. Finally, the wounds are sutured with monocryl 3 zeros. An esophagogastroduodenal series is carried out with water-soluble material 24 hours after the procedure in order to review the anatomy and integrity of the gastric tube and dismiss leaks and obstruction. If no complications are found, clear liquids to tolerance are begun orally.

## Statistical Analysis

For statistical analysis, percentage, average and standard deviations are included for descriptive inference purposes.

## Results

A total of 1,040 GS procedures were performed, in which 5 (0.45%) of them also had a cholecystectomy surgery, 4 (0.39%) a gastric band removal, 3 (0.29%) GS readmissions and 2 (0.19%) of them had a gastric balloon removed, where it was found that women are operated up to 3 times more than men 814 (79.03%), the average age of patients is 35.01 years; Regarding the BMI the average is of 40.16, and the highest BMI being operated was of a female patient with a BMI of 90.56 Kg/m<sup>2</sup>. With reference to the previous metabolic surgeries, we found 24 (2.32%) of the patients had undergone them in an average surgical time of 20.01 minutes with a minimum of 15 minutes, and a maximum of 94 minutes with an average anesthetic time of 37.50 minutes; In addition, within the hospital stay, an average of 1.11 days was found, with a minimum of 1 and a maximum of 5 days. It should be noted that there were no re-admissions, both surgical and non-surgical. (Table 1).

**Table 1: General Results**

Patients	Sex	Average Age	BMI Kg/m <sup>2</sup>	Procedure Time	Anesthetic Time	Days of stay	Previous Metabolic Surgery
1032	814 women (79.03%)	35.01	40.16	20.01min	37.50min	1.11	24 2.32%
	218 men (21.16%)		90.56 MAX	15 ± 94	15±102	1 ± 5	

It should be noted that the morbidities were reduced in number with only 3.20% and we classified them into two groups, the first with the minor ones which occurred in only 2.91% of the total number of patients which are the following: Superficial bleeding in 20 patients representing 1.94% of which 7 (35%) required globular pack transfusion (1-3 units), and 10 (0.97%) patients had an infection at the surgical site. In the second group of major complications, only three were came up: Two gastropleural fistulas (0.19%) and a gastric leak (0.10%) in the total of patients, in these a surgical reintervention was performed in each of them, without eventualities, which increased the hospital stay of each patient to five days.

Other major complications such as pulmonary thromboembolism, ulcer, etc. were non-existent. There were no deaths, so the mortality is 0% (Table 2).

**Table 2: Morbidity and mortality of a GS**

<b>Total of complications</b>	33 (3.20%)
<b>Minor complications</b>	30 (2.91%)
Superficial bleeding	20 (1.94%)
Infection at the surgical site	10 (0.10%)
<b>Major complications</b>	3 (0.29%)
Gastropleural fistulas	2 (0.19)
Gastric leakage	1 (0.10)
<b>Deaths</b>	0 (0%)

## Discussion

Bariatric surgery has proven to be the most effective treatment for obesity, even in its most severe categories. In addition to reducing excess weight, it achieves a high rate of improvement and remission of metabolic comorbidities, which improves the quality and life expectancy of the operated patients [7]. The GS is a relatively new procedure and has become one of the bariatric procedures of choice for treating obesity [7, 8, 10].

The number of bariatric surgeries has increased systematically every year, so the morbidity and mortality of these patients should be considered, as well as the risk of benefit [2, 6, 28].

It was found in literature that the complication rate of a GS ranges from 2.2% to 15.1%, our percentages of comorbidities is 3.20%, which is considered to be relatively low. Some authors indicate that the greater percentage of these are presented in the groups of patients with a previous bariatric surgery [7, 10, 11, 27]; however, for us, no patient with these characteristics presented any complication.

A GS is considered to be a safe procedure for its comorbidities; among the specific complications of bariatric surgery include: fistulas (2.4-4% and up to 8% in conversion surgeries), marginal ulcer (2.4%), bleeding (1-4%), infections (4%), intestinal obstructions, pulmonary

embolism, among the most important [7, 11-13, 26, 29, 30]. In this case study, serious complications (fistula and leakage) represent 0.29% of the total of surgeries; the incidence of fistulas is lower than in other techniques, it is advisable to have meticulous attention with the suture line, to control hemostasis and prevent leakage since these can cause a significant increase in morbidity, while the minor ones are 2.91 % [11]. It is noteworthy that most of these complications were superficial bleedings that were managed with globular concentrates without requiring additional therapy. The infections shown in our patients were only located in the surgical site in 0.10% of the them, in general the infections of the operative area are observed between 2-5% of the operated patients; this condition doubles the risk of dying, and increases the hospital stay by 5-7 days, which causes a significant increase in the cost associated with the surgical intervention [12]. As expected, there were no non-surgical reinterventions and the surgical ones were relatively rare, three in total without presenting another eventuality [11]. Mortality in laparoscopic bariatric surgery is a relatively rare event, its general percentage varies between 0 and 2.0%, this rates are mainly related to the production of fistulas and peritonitis in its great majority (75%) [6, 11, 20, 27, 31]; In our patients none of these situations occurred, this is attributed to the operative technique and the experience of the surgical and multidisciplinary team.

The GS is a procedure with a restrictive and hormonal component with an acceptable operative time that takes between one and two hours [8, 11]; With an average surgical time of 20.01 minutes, our team is faster than most times' analyzed in the literature [8, 10, 11, 21, 22, 28]. This in turn helps reduce the average anesthetic time to 37.50 minutes.

Some authors indicate that their average hospitalization stay is up to 4 days and ours is 1.1 days; it is proposed that the brief hospital stay of our patients is due to the shorter surgical and anesthetic time, which reduces both operative and nosocomial complications and the recovery time [27, 28].

## Conclusions

A GS offers excellent results in long-term weight loss, as well as low morbidity and mortality. The low rate of complications in our patients is attributed to the experience and technique of our surgical team as well as the care of the multidisciplinary team [10, 26].

The brief hospital stay of our patients represents a lower economic cost and decreases the probability of acquiring a nosocomial infection, these two conditions are attributed to the decrease in anesthetic and surgical time.

Bariatric surgery is currently at a peak and opens the way for metabolic control specifically GS, it is a safe procedure due to its low rate of complications and mortality, which is why it is recommended as an excellent alternative for an obesity treatment to increase the quantity and quality of life [2, 10, 21, 22, 31].

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