

EFFECTIVIDAD DE LA GASTRECTOMÍA VERTICAL FRENTE AL BYPASS GÁSTRICO EN Y DE ROUX EN EL TRATAMIENTO DE LA OBESIDAD MÓRBIDA: ¿CÚAL ES LA MEJOR TÉCNICA?

EFFECTIVENESS OF SLEEVE GASTRECTOMY VERSUS ROUX-EN-Y GASTRIC BYPASS IN MORBID OBESITY SURGERY: WHICH IS THE BEST TECHNIQUE?

**EFFECTIVENESS OF SLEEVE GASTRECTOMY VERSUS ROUX-EN-Y
GASTRIC BYPASS IN MORBID OBESITY SURGERY: WHICH IS THE BEST
TECHNIQUE?**

*María Arteaga Ledesma¹, Jennifer Triguero Cabrera^{1,2}, Mónica Mogollón
González¹, Mohamed Hassin Mohamed Chairi^{1,2}, María Jesús Álvarez Martín¹,
Jesús María Villar del Moral^{1,2}.*

*Sección de Cirugía Esofagogástrica y Bariátrica. Hospital Universitario Virgen
de las Nieves (Granada)¹.*

Instituto de Investigación Biosanitaria de Granada (IBS. Granada)²

*María Arteaga Ledesma. Dirección: Calle Doctor Adelardo Mora, 5, 5ª.
Granada.*

E-mail: arteagaledesmamaria@gmail.com

Teléfono: 657785499.



**EFFECTIVENESS OF SLEEVE GASTRECTOMY VERSUS ROUX-EN-Y
GASTRIC BYPASS IN MORBID OBESITY SURGERY: WHICH IS THE BEST
TECHNIQUE?**



bmi journal
seco-seedo

ABSTRACT

The objective of the study was to compare the results after laparoscopic sleeve gastrectomy (LSG) versus laparoscopic Roux-en-Y gastric bypass (LRYGB) in the treatment of morbid obesity in terms of weight loss, comorbidities remission and complications.

An observational unicentric study of 154 obese patients who underwent bariatric surgery from 2012 to 2021 was designed. We report the results of 125 LSG patients and 29 patients with LRYGB.

The effectiveness of LSG and LRYGB as primary treatment for morbid obesity was comparable, without statistical significance related to weight loss. Regarding comorbidities resolution, LRYGB showed better results. Although both techniques associated low morbidity rate, the LRYGB presented with higher intraoperative and postoperative complications rate and longer hospital stay. On the other hand, LSG required a higher percentage of reinterventions and showed worse results related to preoperative reflux disease remission and *de novo* reflux onset.

Key words: sleeve gastrectomy, gastric bypass, effectiveness, complications.

INTRODUCTION

At present, bariatric surgery (BS) is the most effective treatment for morbid obese patients, having proved increased effectiveness in weight reduction and associated comorbidities control when compared to medical therapy outcomes (1).

Over the years, laparoscopic Roux-en-Y gastric bypass (RYGB) has been considered a “gold standard” technique. However, laparoscopic sleeve gastrectomy (LSG) has become the most performed surgical procedure worldwide, despite the lack of evidence concerning its long-term efficacy. Differences between efficiency and safety between these two procedures have been less clarity defined (2).

Thus, the aim of our study was to compare the results obtained after LSG and LRYGB in the treatment of morbid obesity in terms of weight loss, comorbidities remissions and complications.

MATERIAL AND METHODS

An observational unicentric study of patients undergoing BS from January 2012 until January 2021 was conducted. Outcomes at a minimum follow-up of a year.

Patients aged 18 to 65 years-old who fulfilled general criterial to BS were enrolled in the study. The criteria used to determine the type of surgical technique are displayed in Figure 1.

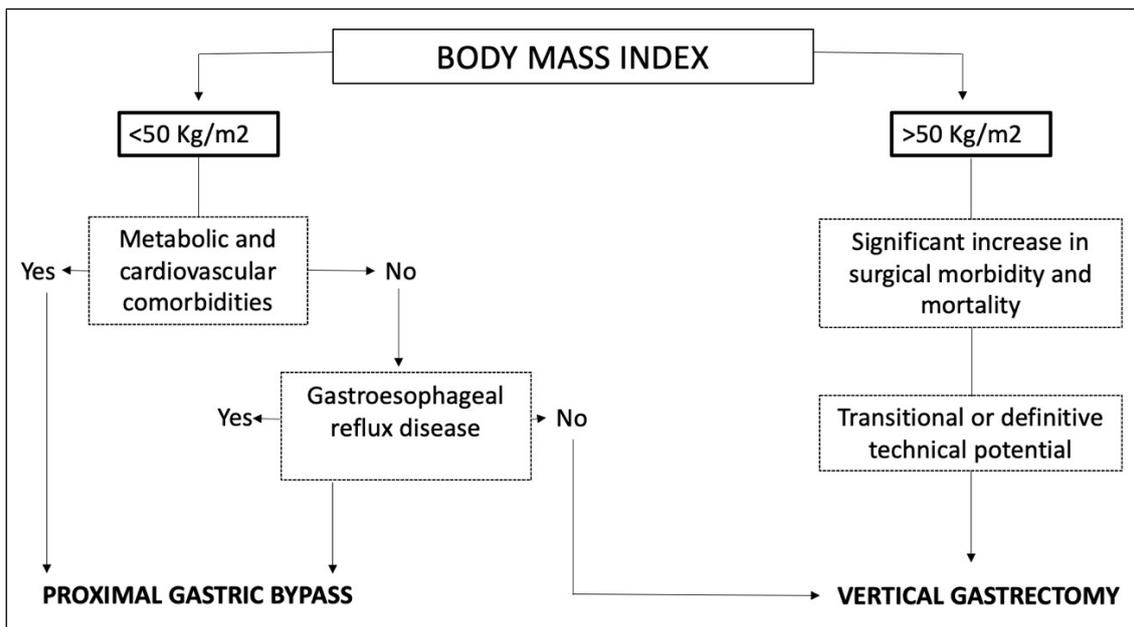


Figure 1. Surgical technique selection criteria

Both techniques were performed by a laparoscopic approach following the standards published in clinical practice guidelines.

The effectiveness of the procedure was evaluated in terms of total weight loss, expressed in percentage of weight loss (%TWL), calculated as: $[(\text{initial weight} - \text{current weight}) / \text{initial weight}] \times 100$ and obesity-related comorbidities remission.

The success rate was defined as $\%WL > 30\%$. The safety of the procedure was evaluated according to intraoperative complications and postoperative morbidity and mortality.

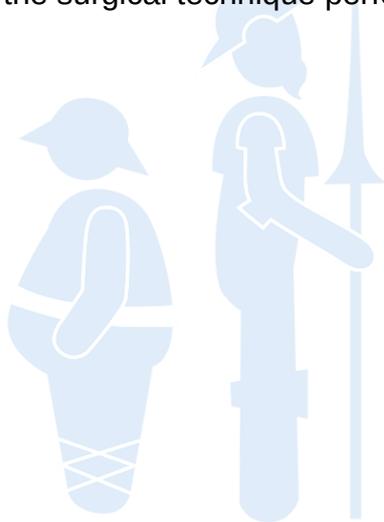
The study protocol was approved by the local Ethics Committee and conducted in accordance with the principles of the Declaration of Helsinki. Written informed consent was obtained from all the participants.

Two groups of study were established based on the procedure performed. Categorical variables were characterized using percentages and compared by

the Chi-square and Fisher's exact test. Continuous data were presented as median and interquartile range and evaluated by Mann-Whitney U test. A cutoff of $p < 0.05$ was used for statistical significance. All calculations were performed by using the SPSS software package version 20.0 (SPSS; Armonk NY).

RESULTS

154 patients were included: 125 (81.2%) underwent LSG and 29 (18.8%) LRYGB. The analysed variables are shown in Table 1, stratified according to the surgical technique performed.



bmi journal
seco-seedo

		LSG (n=125)	LRYGB (n=29)	p	
BASELINE CHARACTERISTI CS	Gender				
	-Male	44(35.2%)	9(31%)	0.671	
	-Female	81(64.8%)	20(69%)		
	Age(years)	44(37-52)	50(39.5-54)	0.229	
	ASA risk				
	-I-II	41(32.8%)	13(44.8%)	0.221	
	-III-IV	84(54.5%)	16(55.2%)		
	Hypertension	61(48.8%)	17(58.6%)	0.341	
	Type 2 diabetes	35 (28%)	13(44.8%)	0.078	
	OSAS	67(53.6%)	16(55.2%)	0.878	
	Cholelithiasis	20(16%)	3(10.3%)	0.441	
	Gastroesophageal reflux	11(8.8%)	13(44.8%)	<0.001	
	Hiatal hernia/esophagitis	24(19.5%)	13(48.1%)	0.002	
	Preoperative intragastric balloon	25(20%)	0	0.005	
Preoperative BMI(kg/m²)	49(44.9-55.3)	42.7(39.6-46.4)	<0.001		
SURGICAL PARAMETERS	Intraoperative hiatal hernia	8(6.4%)	5(19.2%)	0.034	
	Hiatoplasty	8(6.4%)	4(13.7%)	0.106	
	Liver steatosis				
	-No	39(33.3%)	4(16%)		
	-Mild	45(38.5%)	8(32%)	0.023	
	-Moderate/severe	33(28.2%)	12(48%)		
	Laparotomy conversion	2(1.6%)	1(3.4%)	0.468	
	Intraoperative complications	0	1(3.4%)	0.005	
	Intraabdominal drainage	13(10.4%)	5(17.2%)	0.236	
	Operating time (minutes)	100(80-125)	183(165-245)	<0.001	
	POSTOPERATIVE PARAMETERS	Dindo-Clavien			
		- No	123(98.4%)	26(89.7%)	
		-I-II	2(1.6%)	2(6.9%)	0.030
		-III	2(1.6%)	3(10.3%)	
-IV		0	0		
Postoperative complications:					
-Bleeding		3(2.4%)	1(3.4%)		
-Leak		2(1.6%)	1(3.4%)		
-Obstruction		0	2(6.9%)	0.574	
		2(1.6%)	3(10.3%)		
Reintervention		0	0	0.040	
Mortality				1	
Hospital length stay (days)		3(2.2-4)	4(3-5)	0.002	
Hypertension remission		31(50.8%)	12(70.5%)	0.398	
Type 2 diabetes remission	20(57.1%)	11(84.6%)	0.095		
OSAS remission	21(31.3%)	11(68.7%)	0.013		
Postoperative gastroesophageal reflux	38(30.4%)	2(6.9%)			
- <i>De novo</i>	27(21.6%)	1(3.4%)			
-Persistent	11(100%)	1(7.7%)	0.009		
Revisional surgery	13(10.4%)	0	0.082		
%TWL					
-1-month	11.2(8.3-14.5)	10.53(8.3-13.4)	0.825		
-3-months	18.7(15.4-22.9)	20.52(13.7-	0.983		
-6-months	26.6(21.1-30.7)	24.1)	0.773		
-1-year	33.6(27.5-39)	26.4(21.4-29.7)	0.349		
-2-years	36.7(27.5-41.8)	34.2(31.7-39.1)	0.929		
-3-years	30.7(25.3-38.8)	36(27.3-41.8)	0.657		
		39.2(29.6-42.3)			

Table 1. Univariate analysis

ASA: American Society of Anesthesiologist. OSAS: obstructive sleep apnea syndrome.

BMI: body mass index. %TWL: percentage of total weight loss.

No significant differences were found in most of the discussed parameters, except for a higher Body Mass Index (BMI) ($p < 0.001$) and preoperative use of intragastric balloon ($p = 0.005$) in SG patients, with a higher preoperative reflux rate ($p < 0.001$) in those who underwent LRYGB.

In terms of weight progression both techniques significantly reduce it, maintaining a %TWL > 30% at 1 year follow-up. Although there appeared to be no significant difference, a 2 years postoperative weight regain was observed in LSG patients (Figure 2).

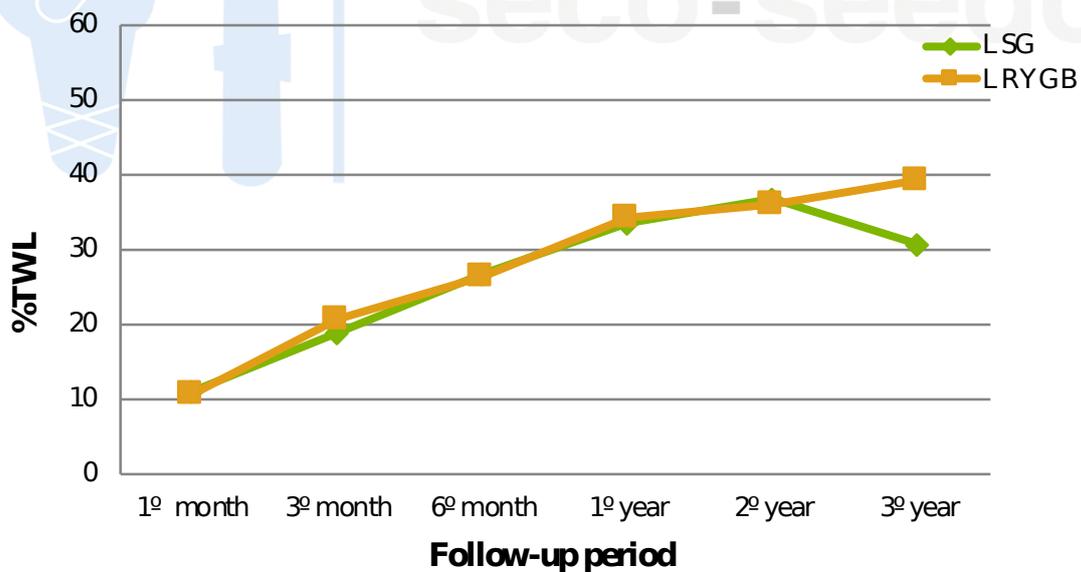


Figure 2. Weight loss evolution according to performed surgical technique.

LRYGB showed a markedly higher OSAS ($p=0.013$) and reflux ($p=0.009$) control when compared to LSG.

Although morbidity and mortality rates were low in both groups, the LRYGB presented with increased intraoperative ($p=0.005$) and postoperative ($p=0.030$) severe complications. Similarly, surgical time and the length of hospital stay were significantly superior in the group of patients who underwent LRYGB. LSG presented with higher rate of postoperative reflux ($p=0.009$).

DISCUSSION

LRYGB and LSG have shown remarkable results in terms of preoperative weight loss and control of obesity-related comorbidities in our population. However, LRYGB appears superior for long-term weight control just as several comorbidities as OSAS and preoperative reflux. Furthermore, both techniques have demonstrated to be safe with low mortality rates.

No significant difference in weight loss was found, in consonance with the results published by Peterly et al (1). However, several studies have shown a better maintenance of the long-term weight loss after LRYGB (2), shift that can also be observed in our study after 2 years follow-up, although there was no statistically significant difference. Whereas there are several studies that compare both techniques, different ways to publish the weight loss make difficult to obtain reliable long-term results. Type 2 diabetes control is one of the endpoints that concerns the most the bariatric surgeon. Although most of the publications show a better control of this comorbidity after LRYGB, in our study, despite a higher remission rate compared to LSG, no statistical differences

were obtained (2,3). Concerning preexisting reflux control, this study agrees with the results published in the literature, showing a better control after LRYGB (1). Worsening of reflux symptoms and *de novo* reflux were more frequently observed after LSG. In most of the cases, reflux symptoms were mild and could be treated in a conservative way, though, a non-despicable number of patients needed conversion to LRYGB, what justifies higher revisional surgery rate in this group.

Regarding postoperative complications, our results were in line with those previously published, with low morbidity rate and no mortality for both techniques (1-3). Nevertheless, LRYBG significantly associated to a higher postoperative complication rate and reoperation. Reinterventions after LRYGB were due to torsion of the enteroanastomosis and gastrojejunal anastomosis leak. After LSG the most frequent cause was the fistula.

The present study has several limitations. Its retrospective nature and the disparity of patients stratified in each group, could be a selection bias. An improvement of the selection criteria to select the optimal bariatric technique and a better preoperative optimization of patients could be the optimum strategy to improve our short and long-term results.

CONCLUSION

In our experience, both LSG and LRYGB are effective and safe techniques to treat morbid obesity with satisfactory short and long term results.

CONFLICT OF INTEREST AND FUNDING

None.

REFERENCES

1. Salminen P, Helmio M, Ovaska J et al. Effect of Laparoscopic Sleeve Gastrectomy vs Laparoscopic Roux-en-Y Gastric Bypass on Weight Loss at 5 Years Among Patients With Morbid Obesity. *The SLEEVEPASS Randomized Clinical Trial*. *JAMA*. 2018;319(3):241-254.
2. Li J, Lai D, Wu D. Laparoscopic Roux-en-Y gastric bypass vs laparoscopic sleeve gastrectomy to treat morbid obesity-related comorbidities: a systematic review and meta-analysis. *Obes Surg*. 2016;26(2):429-442.
3. Gu J, Vergis A. Diabetes improvement and bariatric surgery-review of laparoscopic Roux-en-Y gastric bypass vs. laparoscopic vertical sleeve gastrectomy. *Ann Transl Med*. 2020 Mar; 8(Suppl 1):S10.
4. Luesma MJ, JF, Cantarero I, Kucea P, Santander S. Surgical Treatment of Obesity. Special Mention to Roux-en-Y Gastric Bypass and Vertical Gastrectomy. *Front Endocrinol (Lausanne)*. 2022; 13:867-838.