

Comparative analysis of safety and efficacy between revisional and primary Roux-en-Y gastric bypass: is there an optimal time for safer “redo” surgery?

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Abstract:

The primary end-point of our study was to evaluate the results after Roux-en-Y gastric bypass (RYGB) performed as primary treatment for morbid obesity and revisional surgery (RS) after laparoscopic sleeve gastrectomy (LSG). The secondary endpoint was to assess the influence of the time elapsed between both surgeries in the development of complications after RS.

An observational, single-centre study was carried out on a cohort of 54 patients who underwent RYGB from 2012 to 2021. 29 (53.7%) patients undergone primary RYGB and 25 (46.3%) undergone revisional RYGB.

According to our results, RYGB performed as RS associates higher conversion to laparotomy as well as postoperative complications and hospital readmissions when compared to

primary RYGB. In addition, revisional RYGB showed worse results in terms of weight loss and mayor comorbidities control. Time elapsed between LSG and revisional RYGB showed no impact on the development of adverse events. Therefore, RS must be addressed with caution even in experienced groups since the complexity of the procedure which entails more risk of complications and lower weight loss.

Keywords:

- Gastric bypass
- Revisional surgery
- Primary surgery

Introduction

At present bariatric surgery is the most effective treatment for morbid obesity. From the outset, several techniques have been developed with different mechanisms: restrictive, malabsorptive and mixt.

Roux-en-Y gastric bypass (RYGB) has been considered as gold standard technique up until now (1). Its results have proven to be flattering for both weight loss and long-term comorbidities resolution, with a scarce rate of complications. Along with being the most used procedure as primary surgery, its relevance is related to the rise of revisional surgery (RS) after the failure of other, mainly restrictive, procedures (2).

The aim of our study was to evaluate the results in terms of safety and efficacy after Roux-en-Y gastric bypass (RYGB) performed as primary treatment for morbid obesity and RS after laparoscopic sleeve gastrectomy (LSG). Secondly, we assess the influence of the time elapsed between both surgeries in the development of complications after RS.

Methods

Observational and single-centre study carried out on a cohort of patients who underwent RYGB from January 2012 to January 2021 in a third level referral hospital. Minimum follow-up period required of a year.

Patients ranged from 18 to 65-years-old who fulfill general criteria for BS (3) were included.

Patients with inflammatory bowel disease, adverse psychological evaluation and scarce adhesion to preoperative weigh loss project were excluded.

The efficacy of the procedure was evaluated by weight loss expressed as %TWL ($[(\text{initial weight} - \text{current weight}) / \text{initial weight}] \times 100$), variation of Body Mass Index (BMI) and comorbidities remission rate. The safety was evaluated according to intraoperative complications and postoperative morbidity and mortality.

Continuous data were presented as percentages and compared by the Chi-square and Fisher's exact test. Dichotomous data were expressed as median and

interquartile range and evaluated by Mann-Whitney U test. $P < 0.05$ was considered statistically significant. Data was analyzed using SPSS software package version 20.0 (SPSS, Armonk, NY).

Results

A total of 54 patients were included: 29 (53.7%) undergone primary RYGB and 25 (46.3%) undergone revisional RYGB. Variables analyzed in multivariate analysis are shown in Table 1.

Both groups were comparable in most of the preoperative variables except for older age groups ($p = 0.012$) and android morphotype ($p = 0.042$) in the group of patients who underwent revisional RYGB, and higher body mass index (BMI) in those who underwent primary RYGB ($p = 0.008$).

Laparoscopic approach was performed more frequently when primary RYGB ($p = 0.002$) since conversion rate to laparotomy was significantly higher in revisional RYGB ($p = 0.040$) just as intraoperative finding of hiatal hernia ($p = 0.029$).

Revisional RYGB presented with more postoperative complications ($p = 0.054$) and hospital readmission ($p = 0.054$), although data were not statistically significant. On its behalf, primary RYGB shown more effectiveness for the obstructive sleep apnea syndrome (OSAS) remission ($p = 0.020$) and weight loss. Figure 1 shows the evolution of %TWL in both groups.

No statistically significant difference was found between time elapse to RS and an increase of intra or postoperative complications ($p = 0.588$) but was however related to higher hospital length stay ($p = 0.025$) (Spearman coefficient 0.0448).

		Primary RYGB	Revisional RYGB	
		(n=29)	(n=25)	p
PARÁMETROS PREOPERATORIOS	Gender			
	-Male	9(31%)	7(28%)	0,808
	-Female	20(69%)	18(72%)	
	Age(years)	50(39-54)	54(47-58)	0,012
	ASA			
	-I-II	13(44,8%)	11(44%)	0,951
	-III-IV	16(55,2%)	14(56%)	
	Hypertension	17 (58,6%)	11(44%)	0,284
	Type 2 diabetes	13 (44,8%)	8(32%)	0,335
	OSAS	16(55,2%)	13(52%)	0,816
Cholelithiasis	3(10,3%)	7(31,8%)	0,079	
Preoperative reflux	13(44,8%)	15(60%)	0,266	
Hiatal hernia/esophagitis	13(44,8%)	8(32%)	0,34	
PARÁMETROS QUIRÚRGICOS	Type of obesity			
	-Ginecoid	10(34,5%)	8(32%)	0,042
	-Android	11(37,9%)	16(64%)	
	-Mixt	8(27,6%)	1(4%)	
	Liver esteatosis	18(62,1%)	7(36,8%)	0,087
	Preoperative BMI (kg/m2)	42,7(39,6-46,4)	37,4(33,6-44)	0,008
	Laparoscopy	29(100%)	17(70,8%)	0,002
	Experiencia cirujano			
	-Junior	16(55,2%)	16(64%)	0,51
	-Senior	13(44,8%)	9(36%)	
	Hernia hiato intraoperatoria	5(19,2%)	12(48%)	0,029
	Hiatoplastia	4(13,7%)	5(20%)	0,713
	Gastrojejunal anastomosis			
	-Manual	6(24%)	5(20%)	0,733
	-Mechanic	19(76%)	20(80%)	
	Conversion to laparotomy	1(3,4%)	5(21,7%)	0,04
	Complicaciones intraoperatorias	1(3,4%)	1(4%)	0,932
	Drenaje intraabdominal	5(17,2%)	7(28%)	0,417
	Duración cirugía(minutos)	183(165-245)	201(175-256)	0,195
	Dindo-Clavien			
-I-II	26(89,7%)	23(92%)	0,64	
-III-IV	3(10,3%)	2(8%)		
PARÁMETROS POSTOPERATORIOS	Postoperative complications:			
	-Bleeding	1(3,4%)	1(4%)	0,054
	-Obstuction	0	3(12%)	
	-Leackage			
	-Fuga	1(3,4%)	1(4%)	
	Hospital stay (days)	4(3-5)	4(3-6,5)	0,735
	Hospital readmission	1(3,4%)	5(20%)	0,054
	Hypertension remission	12(70,5%)	5(45,4%)	0,176
	Diabetes remission	11(84,6%)	4(50%)	0,088
	OSAS remission	11(68,7%)	3(23%)	0,02
%TWL:				
-1-month	10,5(8,3-13,4)	8,8(5,3-10,6)	0,088	
-3-months	20,5(13,7-24,1)	14,7(10,6-20)	0,102	
-6-months	26,4(21,4-29,7)	17,8(8,9-25)	0,031	
-1-year	34,2(31,7-39,1)	19,3(8,7-25,5)	<0,001	
-2-years	36(27,3-41,7)	18(12-38,5)	0,079	

Table 1

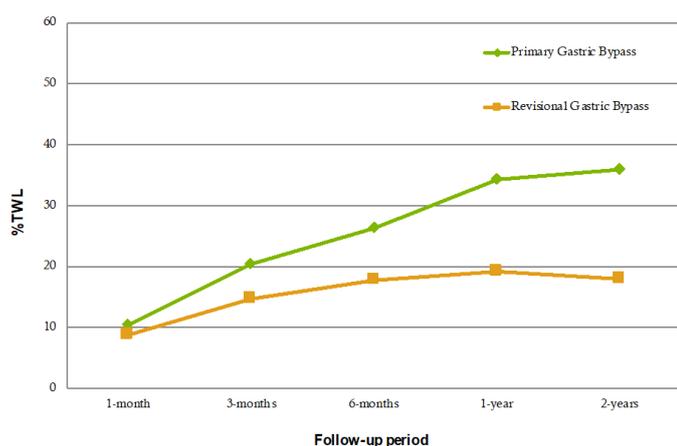


Figure 1. Evolution of the Percentage of Total Weight Loss (%TWL)

Discussion

RYGB has been considered the “gold standard” for RS after restrictive procedures up until now. At present, its indication is queried when the reoperation is due to insufficient weight loss or weight regain, since it does not offer notable long-term results (4). In our cohort, revisional RYGB provided an additional weight loss over the first year after surgery, diminishing its long-term efficacy in agreement with previous publications. On its behalf, primary RYGB got a %TLW>30% from third year on. Persisting with the majority of systematic revisions (5) regarding comorbidities remission, revisional RYGB obtained worse results despite being preoperatively comparable samples.

Publications that compare both procedures are scarce and often include not totally comparable groups (5). In our series, despite there are differences regarding age and BMI, them are not clinically relevant.

Concerning the safety of both procedures, most of the studies conclude with low morbidity rate after primary RYGB just as low conversion rate to an open approach. However, this number differ from other publications as far as it concerns to revisional RYGB with values around 14% for revisional group and 3% for primary group (2). This difference between both techniques could be explained for several reasons as the development of postsurgical abdominal adhesions which stunts laparoscopic approach, incisional hernias through laparoscopic port and complications after primary surgery as fistula or stenosis. Our results are in line with those previously published, thereby revisional RYGB is considered a safe technique, conversion to laparotomy, obstruction, bleeding or leakage are higher when compared to primary RYGB.

Finally, regarding the connection between time elapsed to RS and intra and postoperative morbidity published data are scarce. In our series, no statistically significant difference was found in this regard, but was however related to longer hospital stay. This can be explained by the fact that they are older patients with nutritional deficit and occasionally, severe medical or surgical complications.

The main limitation of our study is its retrospective nature and the absence of pairing groups. A better selection of patients who undergo revisional surgery endorsed by a multidisciplinary committee just as better preoperative optimization of surgery candidate must be a future line of improvement.

Conclusions

Although RYGB performed as RS after LSG offers an additional short-term weight loss, did not obtain optimal long-term results. In addition, it associates more complication rate as conversion to laparotomy and postoperative specific complications. Time elapse between LSG and revisional RYGB did not affect in the onset of complications although it related to higher hospital stay.

Given our results, RS must be addressed with precaution even in experienced hands since its risks are not despicable and weight loss and comorbidities resolution are not optimal.

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