

IS REVISIONAL BARIATRIC SURGERY EFFECTIVE AND SAFE?

Dr Louise Lallemand, CHU de Nantes, FRANCE



Conflicts of interest

- None

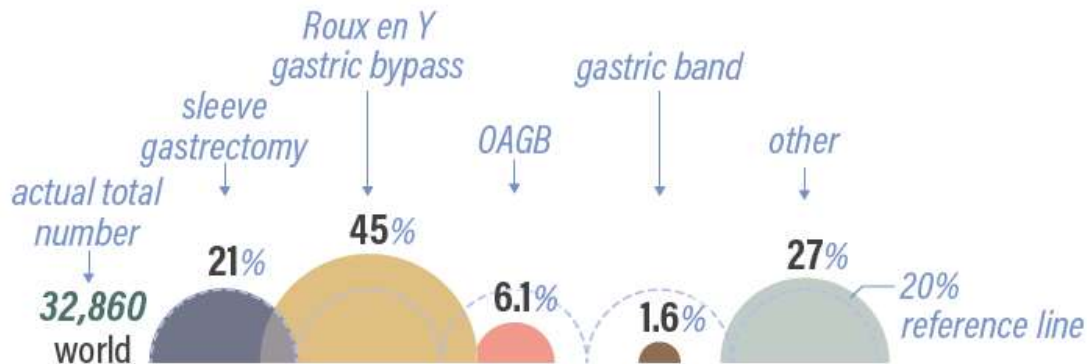
Introduction

Revision surgery after sleeve gastrectomy: a nationwide study with 10 years of follow-up

Andrea Lazzati, MD, PhD, Stéphane Bechet, MSc, Saadeddinne Jouma, MD, L. Paolino, MD, Camille Jung, Md PhD



Revisional procedures by type
World total of revisional procedures



- The rate of revision surgery after sleeve gastrectomy was 12.2%, at 10 years post-procedure.
- The main reason for revision surgery was: persistence of obesity (87.0%) and gastroesophageal reflux disease (5.2%).
- 15.3% patients operated for excess weight loss had a concomitant GERD.

→ What about patient operated for revisional bariatric surgery without GERD ?

Materiel and méthode

- Retrospective multicentric study
- 2 centers, public and private
- Patients with revisional bariatric surgery for inadequate weight loss and weight regain (%EWL<50% at 18 months)
- Patients with a RBS between 2010 and 2021.
- Exclusion criteria :
 - GERD or another complication of the first procedure (hypoglycaemia, malnutrition, anastomotic ulcer...)
 - History of adjustable gastric banding (AGB) were excluded.



Main objective

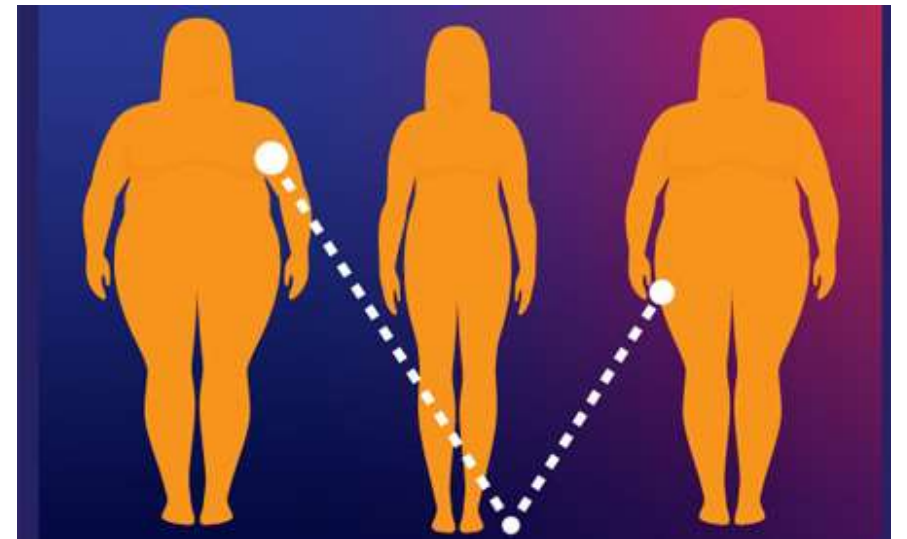
- The aim of our study was to evaluate efficacy and safety of revisional bariatric surgery on patients with failure of weight loss after bariatric surgery without GERD.



Results

- Between 2010 and 2021, 347 patients had a revisional bariatric surgery.
- We excluded 106 patients who had GERD, 76 patients with a history of AGB and 21 patients operated for another side effect of the first surgery (hypoglycaemia, malnutrition...)

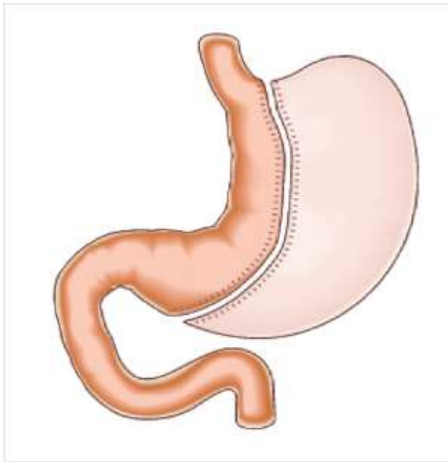
→ 144 patients



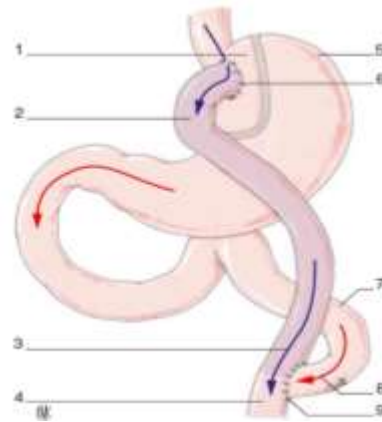
First surgery - Preoperative characteristics

Gender: n (%)	
Female	116 (80.5%)
Male	28 (19.5%)
Age: mean \pm SD (years)	
First surgery	41.5 \pm 10.9
Revisional surgery	47.2 \pm 12.6
BMI: mean \pm SD (kg/m ²)	
First surgery	48.2 \pm 7.6
Revisional surgery	42.4 \pm 6
Smocking history: n (%)	99 (68.8%)
High Blood Pressure: n (%)	47 (32.6%)
Type 2 diabetes: n (%)	39 (27.1%)
Dyslipidemia: n (%)	27 (18.8%)
Disabling bone/joint pathology: n (%)	31 (21.5%)
OSA: n (%)	55 (38.2%)
Positive airway pressure device: n (%)	40 (72,7%)
NASH: n (%)	8 (5.5%)

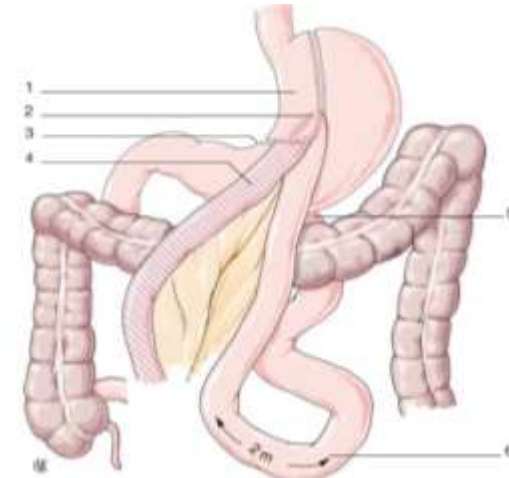
First surgery



SG 74,3%
N=107



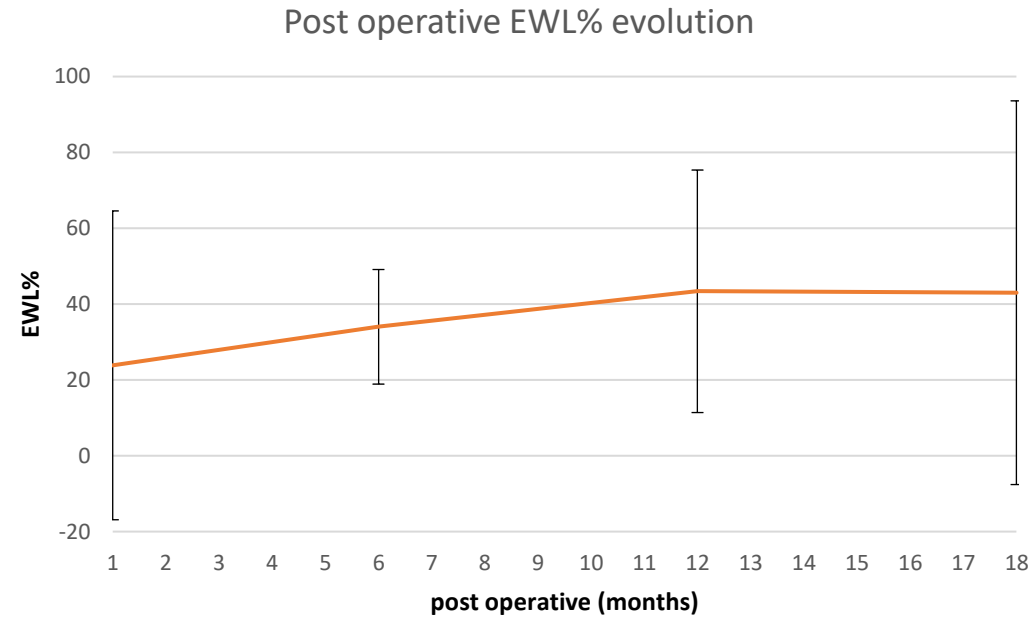
RYGB 19,4%
N=28



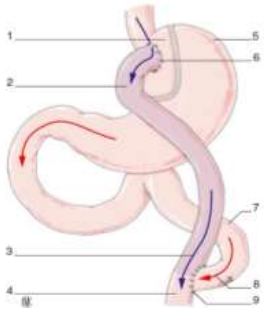
OAGB 6,9 %
N=9

Post operative

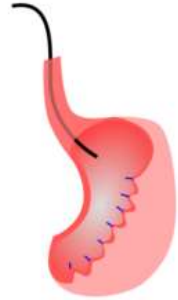
- Early complications : 4.2% (n=6) patients
- Late complications : 5.5% (n=8)
- The mean hospital stay was 4.9 ± 1.6 days
- The EWL% at 18 months was $43.0 \pm 50.6\%$



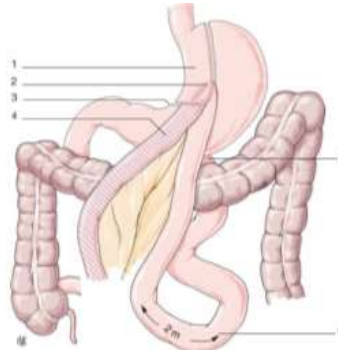
Revisional Bariatric Surgery (RBS)



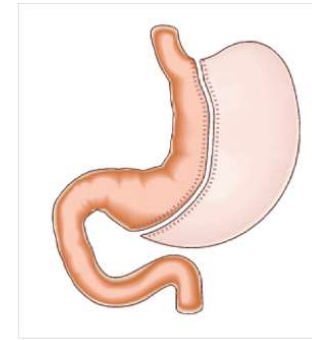
RYGB 61.1%
N=88



Gastric pouch
resizing 13,9%
N=20



OAGB 12.5%
N=18



SG 9,7%
N=14



SADI 2,7%
N=4

Post operative

- The mean hospital stay was 5.7 ± 3.3 days.
- The EWL% at 18 months was $50.2 \pm 29.4\%$
- 34 patients had failure in excess weight loss.
- There is no significant difference in EWL% according to the technique performed during the revisional surgery ($p=0.45$).
- The revisional surgery EWL% at 18 months was higher than during the first surgery significantly ($p<0.01$).

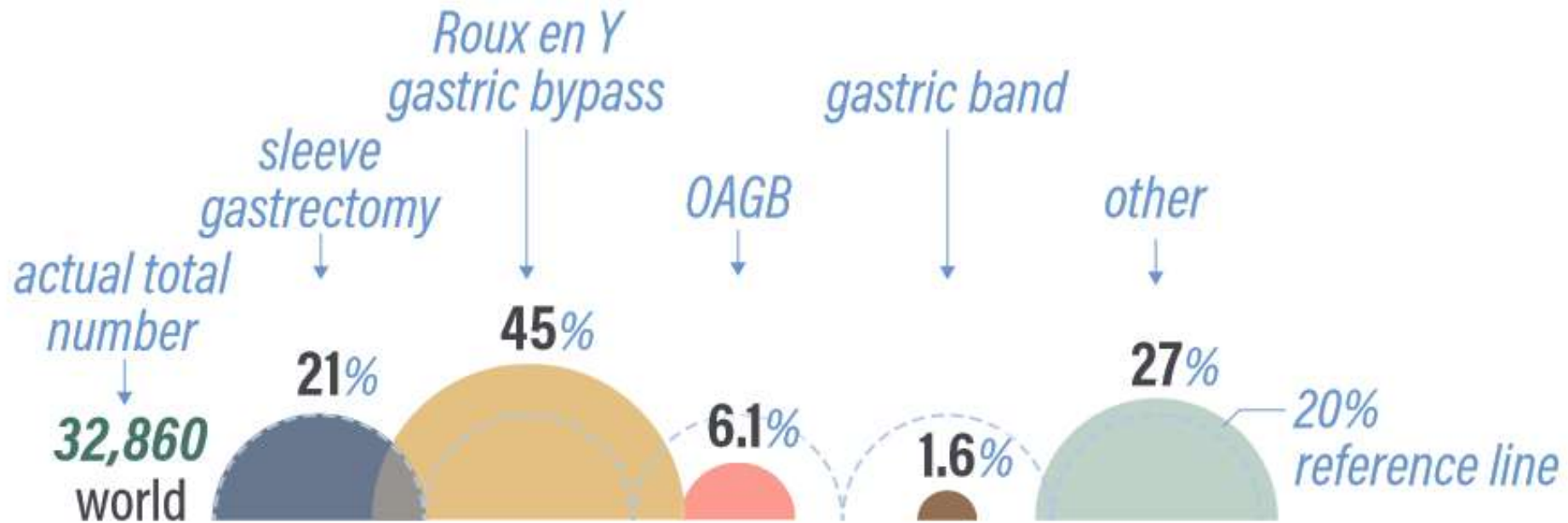


Post operative - complications

	First surgery, n(%)	Clavien-Dindo	Revisional surgery	Clavien-Dindo	p
Early complications	6 (4.2%)		20 (13.8%)		<0.01
Staple line hematoma	3	II	0		
Parietal bleeding	1	I	3	I	
Intra-abdominal abscess	1	III A	3	II	
Fever	1	I	2	I	
Anastomotic leakage	0		4	III B	
Anaemia	0		4	I,II	
Incisional hernia	0		1	III B	
Food intolerance	0		2	I	
Acute renal failure	0		2	II	
Late complications	8 (5.5%)		29 (20.1%)		<0.01
Incisional hernia	4	III B	5		
Adhesion intestinal obstruction	1	III B	1		
Internal hernia					
Anastomotic ulcer	1	II	8	III B	
Anastomotic stenosis	2	I	1	I	
RGO	0		5	III B	
Food intolerance	0		7	I	
	0		2	II	

Discussion

Revisional procedures by type World total of revisional procedures



Wish RBS performed?

Weight-Related Outcomes After Revisional Bariatric Surgery in Patients with Non-response After Sleeve Gastrectomy—A Systematic Review

Stephan Axer^{1,2} · Hans Lederhuber³ · Franziska Stiede⁴ · Eva Szabo⁵ · Ingmar Näslund⁵

- No randomised controlled trial, studies had bias.
- Evidence-based treatment strategies cannot be deduced from the current literature
- OAGB with a 200-cm biliopancreatic limb (BPL) results in as much additional %EWL as GBP with a BPL of 100–150 cm and a common channel of 100 cm at 3 years follow-up
- Weight loss after conversion from SG to SADI is significantly higher compared to conversion from SG to GBP at the time of 4 years follow-up



Predictive factors of complications in revisional gastric bypass surgery: results from the Scandinavian Obesity Surgery Registry

Stephan Axer, M.D.^{a,*}, Eva Szabo, M.D., Ph.D.^b, Simon Agerskov, M.D.^c, Ingmar Näslund, M.D., Ph.D.^b

Discussion - morbidity

- More complications with RBS
 - Intraoperative (15.5% versus 3.0%, $P < 0.001$)
 - Early (24.6% versus 8.7%; $P < 0.001$)
 - Late (17.7% versus 8.7%; $P < 0.001$)
- Complications risk factor :
 - Laparotomy
 - intraoperative complications (OR 3.87; IC95% [2.69–5.57], $P < 0.001$)
 - early complications (OR 2.08; IC95%, [1.53–2.83], $P < 0.001$)
 - late complications (OR 1.91; IC95% [1.31–2.78], $P < 0.001$)

Table 4

Univariate and multivariate analysis of variables associated with early complications in revisional gastric bypass surgery

Characteristic	Univariate analysis (n = 1680)		Multivariate analysis (n = 1656)	
	Odds ratio (95%CI)	P value	Odds ratio (95%CI)	P value
Age	47.4 ± 9.2	—	1.01 (1.00–1.03)	.08
BMI	39.6 ± 7.5	—	1.01 (1.00–1.05)	.17
Sex				
Female	343/413 (83.1%)	.0	REF	—
Male	70/413 (16.9%)	1.03 (.77–1.40)	.80	—
Co-morbidities				
Sleep apnea	27/413 (6.5%)	1.90 (1.16–3.10)	.01	1.80 (1.07–3.04)
Hypertension	129/413 (31.2%)	1.37 (1.08–1.75)	.01	1.08 (.82–1.42)
T2D	51/413 (12.3%)	1.12 (.79–1.57)	.53	—
Hyperlipidemia	38/413 (9.2%)	1.18 (.80–1.75)	.40	—
Index operation				
Sleeve	10/413 (2.4%)	.0	REF	.0
Adjustable banding	129/413 (31.2%)	1.96 (.98–3.92)	.05	1.39 (.68–2.84)
VBG + fixed band	274/413 (66.4%)	2.30 (1.17–4.55)	.01	1.49 (.74–3.00)
Indication for revisional surgery				
Weight failure	209/413 (50.6%)	.0	REF	—
Weight failure and complication	122/413 (29.5%)	.82 (.64–1.06)	.13	—
Complication	82/413 (19.9%)	.80 (.60–1.07)	.14	—
Access in revisional surgery (Intention-to-treat)				
Laparoscopy + conversion	183/413 (44.3%)	.0	REF	.0
Open access	230/413 (55.7%)	2.32 (1.85–2.91)	<.001	2.08 (1.53–2.83)
Technique of the GE				
Linear staple and handsewn	267/413 (64.6%)	.0	REF	—
Completely handsewn	26/413 (6.3%)	2.15 (1.30–3.55)	.002	1.03 (.59–1.79)
Circular staple	110/413 (26.6%)	1.66 (1.28–2.16)	<.001	.81 (.58–1.15)
Intraoperative complication	111/413 (26.9%)	2.68 (2.03–3.53)	<.001	2.04 (1.52–2.74)

CI = confidence interval; BMI = body mass index (kg/m²); T2D = type 2 diabetes; VBG = vertical banded gastroplasty; GE = gastroentero-anastomosis.

Bold font indicates variables included in the multivariate regression to identify factors independently contributing to intraoperative complications in revisional gastric bypass surgery.

Discussion – GLP-1



Adjunctive liraglutide treatment in patients with persistent or recurrent type 2 diabetes after metabolic surgery (GRAVITAS): a randomised, double-blind, placebo-controlled trial

Use of Weight Loss Medications in Patients after Bariatric Surgery

Ilana P. Redmond¹ - Alpana P. Shukla¹ - Louis J. Aronne¹

Accepted: 11 January 2021

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Table 1 Summary of prospective studies of pharmacotherapy for postoperative weight management

Source	Intervention	Number of patients	Patient characteristics	Time elapsed since surgery	Duration of follow-up	Outcomes
Zoss et al. (2002)	AGB with orlistat 120 mg TID + dietary counseling (O) vs dietary counseling (DC)	O=19 DC=19	Post-surgical patients who had stopped losing weight for 3 months	18±6 months	8 months, with partial 9 month extension	% total weight loss O=8.25 DC=3.19 (<i>p</i> <.03)
Zilberstein et al. (2004)	AGB with topiramate 12.5-50 mg/day (T)	T=16	Post-surgical patients with inadequate weight loss	Range 5-13 months	3 months	% excess weight loss (mean) T=13.2
And et al. (2019)	LSG with phentermine/topiramate 7.5/46-15/92 mg/day (PT) vs historical controls (HC)	PT=15 HC=40	Super obese patients started on PT 3 months preoperatively and continued postoperatively	Not applicable	24 months	% total weight loss PT=38.16 (30.94-45.39) HC=27 (22.99-31.02) (<i>p</i> =.007)
Sulman et al. (2019)	Liraglutide 3 mg/day in nonsurgical (NS) and surgical (S)	NS=711 S=76	Patients with a BMI ≥ 30 kg/m ² or ≥27 kg/m ² with comorbidities	Median 4 years	4 months	% total weight loss (median) NS=6.4 (2.5-9.8) S=6.1 (3.1-8.7)

-3,8kg after 2 years

Table 2. Results of multivariable linear regression analyses of the change from baseline to 26 weeks in clinical outcome variables in complete-cases population. Covariates were baseline values of the outcome variable, treatment assignment (Liraglutide vs Placebo) and type of surgery (VSG vs RYGB). Coefficients for each covariate listed. Significant *p*-values <0.05 highlighted in bold. LDL, low-density lipoprotein; HDL, high-density lipoprotein; TG, triglycerides

Primary endpoint	Baseline value			Treatment (Liraglutide vs Placebo)			Type of Surgery (VSG vs RYGB)		
	Coefficient	95% CI	<i>p</i> -value	Coefficient	95% CI	<i>p</i> -value	Coefficient	95% CI	<i>p</i> -value
HbA1c (mmol/mol)	0.70	0.48 to 0.91	<0.001	-13.3	-19.7 to -7.0	<0.001	-4.67	-11.4 to 2.0	0.109
HbA1c (% units)	0.06	0.04 to 0.08		-1.22	-1.80 to -0.64		-0.43	-1.04 to 0.18	
Secondary endpoints									
Weight (kg)	0.95	0.89 to 1.00	<0.001	-4.23	-6.81 to -1.64	0.002	-2.04	-5.00 to 0.93	0.175
SBP (mmHg)	0.87	0.47 to 0.84	<0.001	2.14	-5.32 to 0.90	0.123	-7.99	-10.80 to -5.18	0.206
DBP (mmHg)	0.51	0.33 to 0.70	<0.001	2.88	-1.67 to 7.44	0.211	-1.41	-6.36 to 3.55	0.573
Total Cholesterol (mmol/L)	0.58	0.42 to 0.75	<0.001	-0.03	-0.41 to 0.35	0.879	-0.36	-0.77 to 0.05	0.087
LDL cholesterol (mmol/L)	0.73	0.55 to 0.92	<0.001	0.04	-0.29 to 0.37	0.813	-0.23	-0.58 to 0.13	0.213
HDL cholesterol (mmol/L)	0.89	0.74 to 1.03	<0.001	0.03	-0.06 to 0.13	0.545	-0.03	-0.15 to 0.09	0.622
Triglycerides (mmol/L)	0.18	0.10 to 0.25	<0.001	-0.26	-0.56 to 0.04	0.089	-0.29	-0.61 to 0.04	0.081
King's Obesity Staging Criteria score	0.84	0.70 to 0.98	<0.001	0.23	-0.87 to 1.32	0.082	-0.66	-1.86 to 0.53	0.273

Conclusion

- RBS is efficient to treat failure in EWL and weight regain
- RBS is associated with higher morbidity
- An association of surgery with GLP1 treatment is maybe a good option



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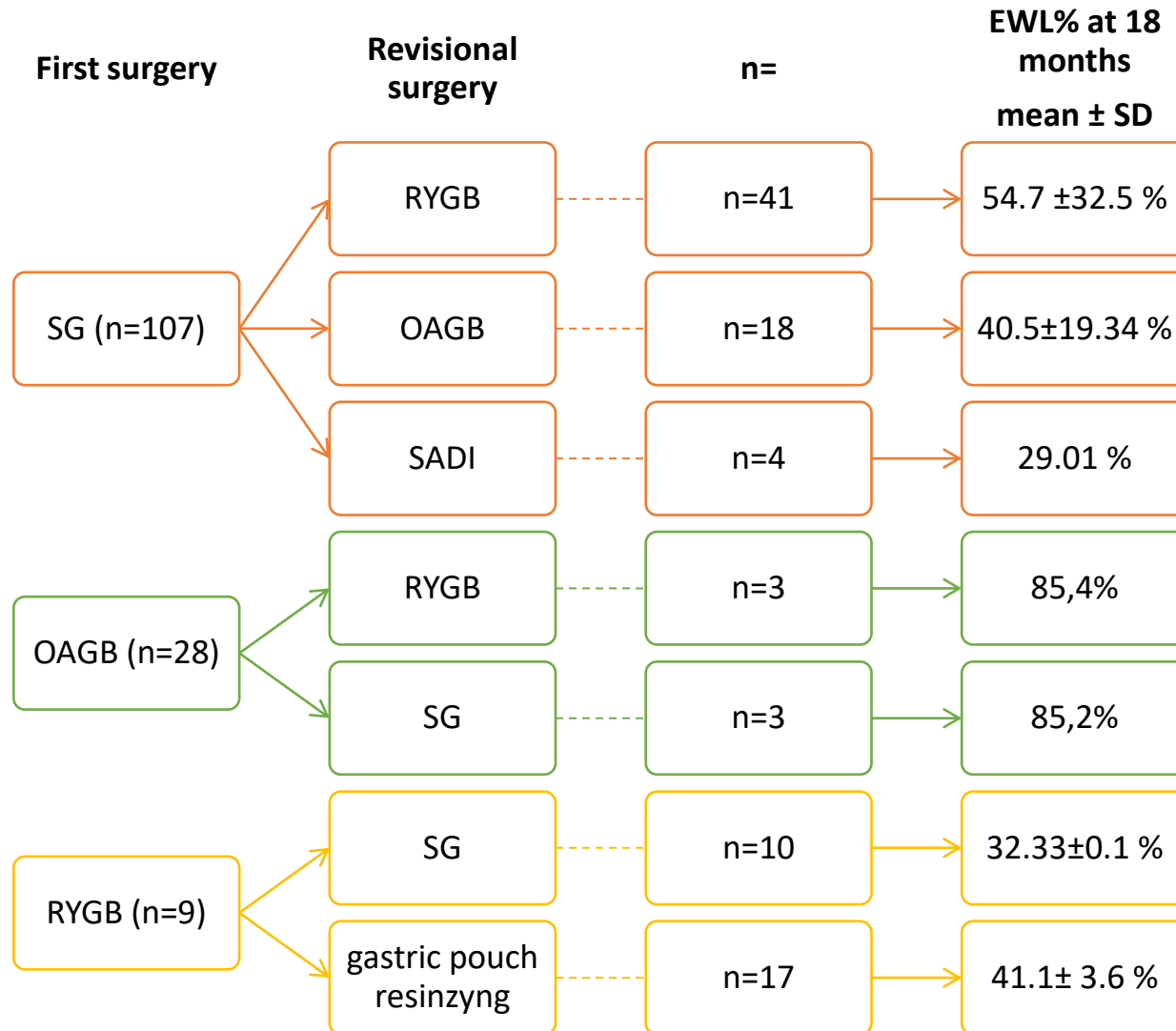
Hôpital Privé Océane, Vannes

Adrien STERKERS

Hôpital Privé St Grégoire

Thank you for your attention

Wish RBS performed ?



No significant difference
P = 0,45

Wish RBS performed?

Revisional Bariatric Surgery for Unsuccessful Weight Loss and Complications

Hideharu Shimizu • Shohrat Annaberdyev • Isaac Motamarry • Matthew Kroh • Philip R. Schauer • Stacy A. Brethauer

Table 4 Weight loss results according to the type of primary bariatric procedures in the unsatisfactory weight loss group. A total of 97 (92.4 %) of 105 patients were included in the analysis for weight loss outcomes with >1 year follow-up

BMI body mass index, *BW* body weight, *EWL* excess weight loss

^a Defined as BMI at primary bariatric surgery

^b Defined as the period from primary bariatric surgery to revisional surgery

Variable	Primary restrictive (n=66)	Primary bypass (n=31)	P
Initial BMI ^a	57.2±15.4	56.6±12.4	0.8
Initial BW	159.2±52.1	157.5±42.8	0.9
Interval ^b	9.2±10.8	8.6±7.9	0.8
BMI at revision	51.6±12.2	47.0±8.5	0.04
BW at revision	143.9±42.5	131.7±31.6	0.1
Follow-up period	2.5±1.4	1.9±0.9	0.02
BMI at follow-up	37.5±11.8	38.9±9.2	0.9
BW at follow-up	106.7±41.2	110.8±31.9	0.7
EWL from revision	53.7±29.3	37.6±35.1	0.03
≥50 % EWL from revision	38 (57.6 %)	11 (35.5 %)	0.04
EWL from primary surgery	62.4±24.1	55.4±24.8	0.2
≥50 % EWL from primary surgery	42 (63.6 %)	16 (51.6 %)	0.2

Wish RBS performed?

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≥50 % EWL from primary surgery	42 (63.6 %)	16 (51.6 %)	0.2

Predictive factors for failure in EWL

	EWL%<50%	EWL%>50%	OR (IC95%)	p
Age (years) : mean ± SD	57.8±9.6	51.3±11.9	1,06(1.01-1.11)	0.03
Gender			0.12(0.32-5.10)	0.7
Male	6	4		
Female	28	24		
Smocking history			0.32(0.26-2.1)	0.7
No n	23	17		
Yes n	10	11		
First surgery BMI : mean± SD	53.5±7.8	47.2±6.6	1,14(1.04-1.24)	<0.01
Revisional surgery BMI : mean ±SD	46.5±6.1	44.1±15.3	0.83(0.97-1.10)	0.36
First surgery EWL% at 18 months : mean ± SD	8.5±43.7	48.2±32.4	0,97(0.95-0.99)	<0.01
Time between the two surgery	42.2±31.7	49.9±28.0	0.96(0.97-1.01)	0.32

Discussion – predictive factors

- **Post operative follow up+++**

Postoperative Follow-up After Bariatric Surgery: Effect on Weight Loss

Konstantinos Spaniolas¹ · Kevin R. Kasten¹ · Adam Celio¹ · Matthew B. Burruss¹ · Walter J. Pories¹

Does Patient Compliance with Follow-up Influence Weight Loss After Gastric Bypass Surgery? A Systematic Review and Meta-Analysis

Hyun Joon Kim · Aman Madan · Douglas Fenton-Lee

- High preoperative weight
- young age
- Male gender
- Correlations between predicted weight and real weight

A Predictive Model of Weight Loss After Roux-en-Y Gastric Bypass up to 5 Years After Surgery: a Useful Tool to Select and Manage Candidates to Bariatric Surgery

Kevin Seyssel¹ · Michel Suter^{2,3} · François Pattou⁴ · Robert Caiazzo⁴ · Helene Verkindt⁴ · Violeta Raverdy⁴ · Mathieu Jolivet^{5,6} · Emmanuel Disse^{6,7} · Maud Robert^{8,9} · Vittorio Giusti⁹

- Older age
- Unemployment
- Hypertension
- Number of comorbidities

Are there really any predictive factors for a successful weight loss after bariatric surgery?

Diego Cadena-Obando¹ · Claudia Ramirez-Renteria² · Aldo Ferreira-Hermosillo³ · Alejandra Albarrán-Sanchez⁴ · Ernesto Sosa-Eroza¹ · Mario Molina-Ayala¹ and Etual Espinosa-Cárdenas^{1*}



Conclusion

- RBS is efficient to treat failure in EWL and weight regain
- RBS is associated with higher morbidity
- High age, high first surgery BMI and low first surgery EWL% at 18 months seem to be predictive of failure in weight loss.