WHY I DON'T DO SADI-S (as a primary procedure)

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IFSO

XXVIII IFSO World Congress

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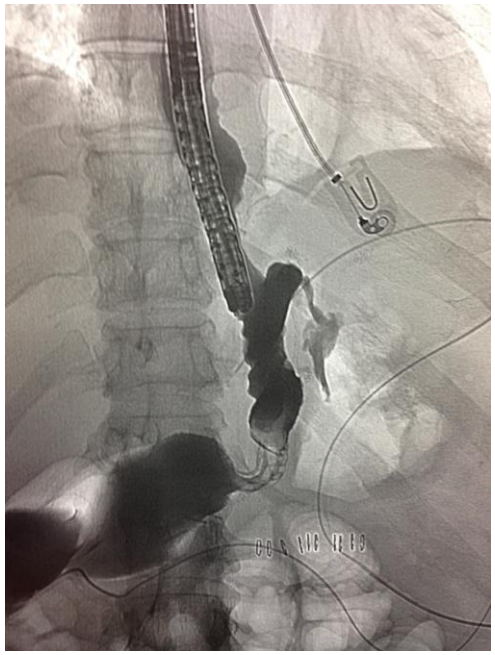
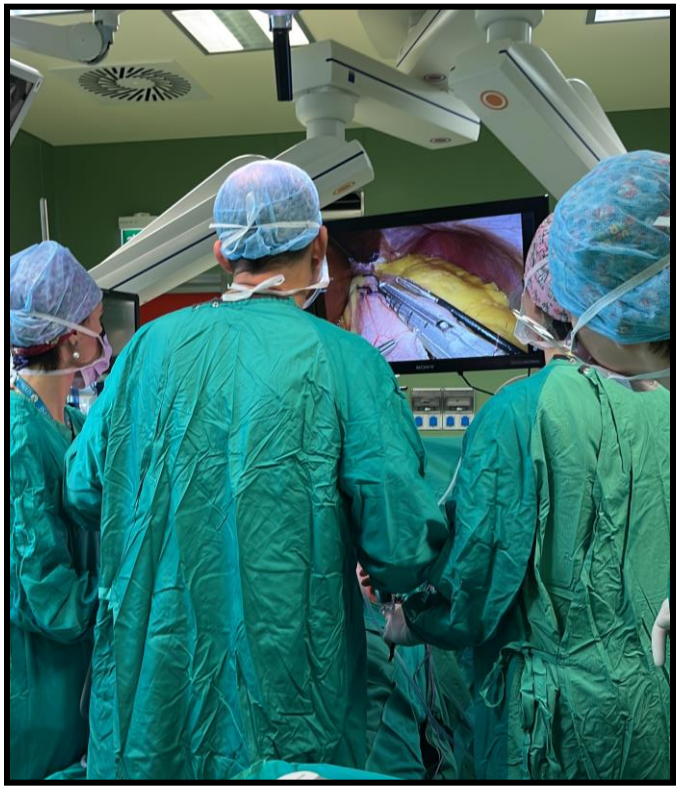
SICOB Center of Excellence

Procedures 2024

- MCH (Cotignola)
- January- December: 992 procedures
- SPDH (Faenza)
- January- December: 483 procedures
- TOTAL: 1475



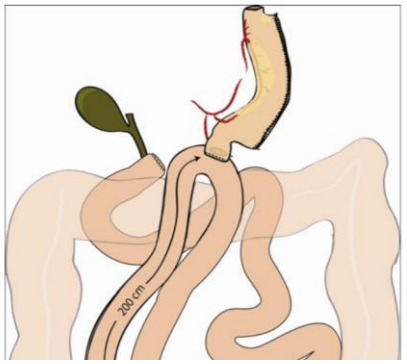


SURGICAL PROCEDURES

- ENDOSCOPIC GASTROPLASTY
- LPS SLEEVE GASTRECTOMY
- LPS OAGB
- LPS RYGB
- LPS SADI-S, SAJI
- REVISIONS OF SG, OAGB, RYGB, BPD, VBG
- LAGB REVISION (Laparoscopic Adjustable Gastric Banding)
- BARICLIP

BACKGROUND

OBES SURG (2010) 20:1720–1726



odeno–Ileal Bypass with Sleeve
One to Three-Year Follow-up

Nutritional Deficiencies

A great weight loss in a short time is invariably accompanied by analytical changes, which reflect the metabolic transformation of the organism. It is difficult to evaluate malnutrition when the patient is submitted to a "programmed undernutrition". As a single value hardly reflects the exact nutritional state, several markers are generally evaluated, including blood cells counts and different protein levels [18]. We detected few alterations in red blood cell counts: ten percent of the patients had low levels of hemoglobin or hematocrit, and 22% had low iron levels. Patients with ferropenic anemia were mainly fertile young women. After BPD, the estimated prevalence of anemia is around 40%, which can be reduced to 5% with proper iron and folate administration [19]. Dolan et al. [9] found a variable rate of 11–40% of low hemoglobin and hematocrit values after BPD or duodenal switch with 80% of the patients receiving adequate dietary supplemenatation, and Marceau [20] reported a 14% rate of moderate anemia after duodenal switch.

Low levels of albumin were detected in 10% of the cases, with a higher rate of hypoproteinemia (25%). Clinical malnutrition was detected in four patients, with asthenia, edema, and hypoalbuminemia. Two of the patients had abdominal problems (an abscess and severe diarrhea) which were successfully treated with the reversal of hypoproteinemia. The other two patients were two women who recognized a very low protein intake due to psychological problems or fear of weight regain. Both of them were treated with psychological support plus a protein-rich diet. Similar rates of malnutrition are found after BPD or DS, and in most cases are secondary to non-compliance with the prescribed diet, which must include a minimal intake of 90 g of protein per day [19, 20]. No patient has been submitted to a reversal operation, and though follow-up is still short, most of the revisions of malabsorptive surgery for malnutrition are performed between the first and the second postoperative year [21]. Figures tend to improve in patients completing the second and third postoperative years, all but iron and parathormone levels. Practically all patients need calcium and vitamin D_3 supplements at long-term, with more than 50% of them needing high doses of calcium (more than 2 g per day) and vitamin D_3 (5,000–10,000 IU per day) to reach vitamin D_3 levels over 30 ng/ml and parathormone under 100 pg/ml. High doses of cholecalciferol are recommended for gastric bypass [22] and for BPD [23] to maintain normal levels of parathormone.

Table 1 Postoperative analytical results

	First Year			Second Year			Third Year		
	Mean	Range	Percent abnormal	Mean	Range	Percent abnormal	Mean	Range	Percent abnormal
Hemoglobin (g/dl)	13.6	10.8–17	10	13.1	10.3–16.3	12	13.4	11.6–16.3	10
Hematocrit (%)	40.5	32–50	10	39.1	31.8–47.8	12	39.5	34.2–46.5	0
Iron (μg/dl)	73.4	22–148	22	84	21–150	11	73.2	26–105	14
Proteins (g/dl)	6.7	5.1–8.4	24	6.5	5.6–7.8	25	6.3	5.7–7.2	25
Albumin (g/dl)	4	2.9–4.8	10	3.9	2.7–4.8	10	3.9	3.2–4.6	0
Vitamin B_{12} (pg/ml)	408.9	129–1,500	6	355.9	129–693	7	323.8	193–422	0
Folic acid (ng/ml)	5.3	1.7–17.1	14	6.1	1.9–20	14	5.1	1.9–9.0	16
Calcium (mg/dl)	9.5	8.4–10.4	2	9.4	8.6–10.2	0	9.4	8.9–10	0
Parathormone (pg/ml)	56.3	22–122	8	63.6	32–245	13	74.1	39–121	25
Vitamin D (ng/ml)	27.7	5.12–67	30	28.3	4–66	40	26.1	4–49	40

Table 2 Glycemic and lipidic profiles. Comparison between pre and postoperative values

	Units	Preoperative			Postoperative		
		Mean	Range	Percent abnormal	Mean	Range	Percent abnormal
Glucose[a]	mg/dl	174.5	91–292	90	97	65–101	0
HbA1c[a]	%	7.6	5.4–10.5	60	5.4	4.1–6.5	0
Triglycerides	mg/dl	196.5	63–582	60	109.6	50–317	16
Cholesterol	mg/dl	187	110–254	46	134.9	81–196	0
HDL cholesterol	mg/dl	44	30–77		45	29–81	
LDL cholesterol	mg/dl	108	35–197		68.3	19.2–116	

[a] Only for diabetic patients

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ORIGINAL CONTRIBUTIONS

Evaluation of Metabolic Outcomes Following SADI-S: a Systematic Review and Meta-analysis

Kevin Verhoeff[1] · Valentin Mocanu[1] · Aiden Zalasky[2] · Jerry Dang[1] · Janice Y. Kung[3] · Noah J. Switzer[1] · Daniel W. Birch[4] · Shahzeer Karmali[4]

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Nutritional Deficiency Outcomes

Following SADI-S, deficiency of vitamins A, D, E, K, and B12 occurred in 12.6%, 32.1%, 0.0%, 0.5%, and 3.4% of patients (Supplemental Material 2, Table 2S). Comparatively, patients undergoing other malabsorptive procedures had a greater proportion of patients with vitamin A, D, E, K deficiencies (35.6%, 53.1%, 2.7%, and 1.2%, respectively). Hypoalbuminemia occurred in 24/476 (5.0%) of patients after SADI-S compared to 4/279 (1.4%) of patients undergoing other surgery. Notably, malabsorptive outcomes were only available for studies comparing SADI-S to DS ($n=7$ studies), and SADI-S to LRYGB ($n=1$ study). When LRYGB outcomes were removed, malabsorptive complications remained similar. Vitamin A, D, E, K, and B12 deficiencies occurred in 35.6%, 49.7%, 2.7%, 1.2%, and 3.4% of patients with hypoalbuminemia in 1.1% of DS patients. Nutritional deficiency outcomes were only available at longest term follow-up.

Weight Loss Outcomes

Total weight loss at longest follow-up was 50.89 kg (37.3% total body weight loss) after SADI-S and 52.1 kg (35.6% total body weight loss) after other MPs. Weight loss after DS was 54.5 kg (37.6% total body weight loss), and after OAGB weight loss was 52.3 kg (31.8% total body weight loss), while LRYGB had weight loss of 50.4 kg. BMI improved to 29.8 kg/m^2 after SADI-S (a 19.8 kg/m^2 reduction) and 30.7 kg/m^2 after MPs (a 18.0 kg/m^2 reduction) (Table 4). After DS, BMI improved to 31.1 kg/m^2 (a 19.3 kg/m^2 reduction), while LRYGB resulted in BMI of 31.4 kg/m^2 (a 14.3 kg/m^2 reduction). BMI was not reported in studies comparing SADI-S to OAGB.

Malabsorptive outcomes remain a concern following SADI-S and are noted to be of interest in the most recent IFSO position statement due to concerns of increased risk in this procedure. In this study, we show that malabsorptive complications remain rare and may in fact be lower when compared to other procedures. This may be due to common channels frequently being 250–300 cm in our included studies and rarely shorter than 250 cm. It should be recognized that malabsorptive complications occurred frequently with shorter ileal limb lengths [34]. However, malabsorptive complications were primarily reported in studies comparing SADI-S to DS, and a more appropriate conclusion may be that SADI-S has fewer malabsorptive complications than DS. Unfortunately, 12-month malabsorption outcomes were rarely reported and a sensitivity analysis could not be completed to standardize follow-up between groups. Addi-

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ORIGINAL ARTICLE

Revisional surgery for malnutrition after SADI-S: prevalence, indications, techniques and outcomes

Andrés Sánchez-Pernaute[1] · Bibiana Lasses[1] · Leyre López Antoñanzas[1] · Miguel Ángel Rubio[2] · Clara Marcuello[2] · Natalia Pérez Ferré[2] · Antonio Torres[1] · Elia Pérez-Aguirre[1]

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Indication for reoperation was individualized, and different parameters influenced this decision, as were age, severity of the episode, psychiatric evaluation, social status, number of episodes, coexisting diseases, etc. The main cause for reoperation was severe malnutrition in most cases (12 patients). The mean (SD) total protein value was 5.3 (0.76) gr/dL, and mean albumin 2.6 (0.6) gr/dL, and all patients presented with edema in lower limbs and moderate to severe deficiencies in fat-soluble vitamins and minerals (zinc, selenium, and copper). Intractable diarrhea was present in some patients (four cases); there was one patient with severe hypocalcemia and 3 had developed liver failure, two secondary to alcohol consumption and one to viral hepatitis and cirrhosis (Table 1).

Obesity Surgery (2022) 32:682–689
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was found, and antibiotic therapy was started.

The operative liver biopsy revealed normal histology in 5.4%, mild steatosis in 48%, moderate in 28%, and severe steatosis or steatohepatitis in 17% of the cases.

Follow-up and Long-Term Outcome

There was no mortality. Follow-up was 84.7% at 5 years and 75% (60/80) at 10 years (Fig. 2). Weight loss is presented in Table 1 and Fig. 3. Eighty-two percent of the patients maintained vitamin D supplementation in the long term, 75% had calcium, 45% iron, 25% vitamin E, and 20.5% vitamin A. Despite supplementation, deficiencies were frequently seen, particularly in ferritin (66.7%), vitamin D (57.9%), and vitamin A (26,7%). Laboratory tests data are presented in Table 2.

Twelve patients have been submitted to revisional surgery for recurrent hypoproteinemia (7.3%), 7 of them in the initial group with a 200 cm common limb (14%), 5 among those with a 250 cm limb (5%), and none of those with a 3 m common channel. One patient was submitted to re-sleeve for insufficient weight loss.

There were 101 patients with diabetes mellitus, with a mean time from diagnosis of 9 years. The evolution of the disease, as well as arterial hypertension and obstructive

There was 1 gastric leak and 2 duodeno-ileostomy leaks; one of them needed reoperation while the other was managed conservatively. One patient was reoperated for an intestinal perforation, and 2 were submitted to revisional laparoscopy for peritoneal bleeding. One patient presented intraluminal bleeding from the gastric staple line and was submitted to endoscopic treatment. Two patients suffered from abdominal hernia incarceration, one from a preexisting epigastric hernia and the other one from a trocar site hernia; both were reoperated. Two patients underwent long respiratory support, and one needed tracheostomy for weaning. The mean postoperative stay was 7 days. After discharge, 23 patients were attended in the emergency ward in the first month (14%), and 5 were re-admitted (3%) for fever or abdominal pain. Only in one case, an abdominal collection was found, and antibiotic therapy was started.

The operative liver biopsy revealed normal histology in 5.4%, mild steatosis in 48%, moderate in 28%, and severe steatosis or steatohepatitis in 17% of the cases.

Four patients had a previous cholecystectomy in 18, it was performed along with the weight-loss surgery, because of symptomatic cholelithiasis, and in 11 cases (7.7%) cholecystectomy was performed in the follow-up, only one for acute cholecystitis.

Eleven patients have died in the follow-up for different causes: 4 due to respiratory disease, 1 for end-stage renal disease, 1 after a cerebrovascular accident, 1 for unknown cause peritonitis, and 3 due to neoplastic disease (gastric, bladder, and lung). Four other patients are alive with neoplastic disease, colon, lung, bladder, and melanoma, for a total rate of 4.2% of new tumors diagnosed after the operation and a total incidence density rate of 0.6 cancer cases per 100 person-years. One patient died due to respiratory infection for COVID-19; another one survived the infection after 3 months under ventilatory support. Nephrolithiasis with hyperoxaluria has been detected in 7 cases (4.2%), slightly more frequent between patients with a shorter common limb (6.3% in patients with a 2 m limb).

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ORIGINAL CONTRIBUTIONS

Bile Reflux After Single Anastomosis Duodenal-Ileal Bypass with Sleeve (SADI-S): a Meta-analysis of 2,029 Patients

Ray Portela[1] · Katie Marrerro[2] · Ahmet Vahibe[1] · Carlos Galvani[3] · Helmuth Billy[4] · Barham Abu Dayyeh[5] · Benjamin Clapp[6] · Omar M. Ghanem[1]

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SADI-S. We found a reported rate of bile reflux of 1.23% in SADI-S patients.

While GERD has been extensively studied in patients who undergo MBS [16], bile reflux has not been extensively reported as it is challenging to detect. By design, the loop configuration of SADI-S makes it more susceptible to bile reflux. Yashkov et al. has recently proposed that both the distance of the duodenal transection from the pylorus and the initial pyloric insufficiency could potentially be correlated with bile reflux after the procedure [10]. A careful technique with reconstruction of the anastomosis post-pyloric while avoiding deformity of the duodeno-ileal anastomosis can possibly prevent bile reflux [2, 10, 17]. However, bile reflux can still happen even if all the above technical aspects are met [18]. This suggests that a hypotonic pylorus might be involved in the pathogenesis.

In our analysis, we found the reported event rate of bile reflux to be quite low. While this could be factual, it might be falsely decreased due to the difficulty in diagnosing bile reflux, lack of long-term follow-up, or bias. In a systematic

nutrients

MDPI

Article

Medium-Term Nutritional and Metabolic Outcome of Single Anasto Gastrectomy (

Giuseppe Marincola [1,†], Francesco Greco [1], Luca S Esmeralda Capristo [3,6], G

		Before SADI-S		24 Months after SADI-S		
	Reference Values	**Median**	**% Deficiency**	**Median**	**% Deficiency**	***p* Value ***
Hemoglobin (g/dL)	F (12.0–15.0 g/dL) M (13.0–17.0 g/dL)	13.3 (12.15–13.75)	18.18%	12.9 (11.4–13.2)	3.03%	0.012
Total Serum Protein (g/L)	(65–85 g/L)	78 (74.5–81.5)	0.00%	66 (63.5–70.1)	1.52%	0.088
Albumin (g/L)	(34–48 g/L)	41 (39.1–43.3)	1.52%	38 (34.5–42.1)	4.52%	0.078
Calcium (mg/dL)	(8.6–10.2 mg/dL)	9.6 (9.2–9.8)	0.00%	8.9 (8.6–9.2)	0.00%	0.001
Sodium (mmol/L)	(135–145 mmol/L)	140 (139–141)	0.00%	141 (139–141.0)	0.00%	0.472
Potassium (mmol/L)	(3.0–5.0 mmol/L)	3.9 (3.6–4.05)	0.00%	4.0 (2.9–4.4)	3.03%	0.241
Chloride (mmol/L)	(98–108 mmol/L)	103 (100.5–107.2)	0.00%	103 (99.0–108.5)	1.52%	0.498
HDL (mg/dL)	(>40 mg/dL)	46 (38.5–55.1)	22.72%	52 (29.0–70.5)	1.52%	0.577
LDL (mg/dL)	(<130 mg/dL)	103 (95.0–158.2)	18.18%	60 (50.6–142.6)	1.52%	0.475
HbA1c (mmol/mol)	(23.0–41.0 mmol/mol)	46 (43.1–46.5)	9.09%	30 (24.5–40.5)	0.00%	0.048
Glucose (mg/dl)	(65–110 mg/dL)	90 (84.50–106)	16.67%	81 (75.0–87.0)	0.00%	0.021
Vitamin D (ng/mL)	(31–100 ng/mL)	29.4 (16.1–38.7)	12.12%	28.8 (10.2–39.7)	31.82%	0.406
Vitamin B12 (pg/mL)	(187–883 pg/mL)	436 (373.7–1193.5)	0.00%	945 (678.0–1035.0)	1.51%	0.5
Folic acid (ng/mL)	(>4 ng/mL)	4.9 (3.15–7.92)	3.03%	6.3 (3.3–12.8)	9.09%	0.312
Parathormone (pg/mL)	(14–72 pg/mL)	63.3 (48.2–100.4)	12.12%	57.5 (34.02–111.0)	9.09%	0.931

* *p*-value refers to comparison continuous values.

Table 6. Partial or total resolution of comorbidities after SADI-S (66 patients).

	Before SADI-S	**After SADI-S**		
Co-Morbid Condition		**Partial Resolution**	**Total Resolution**	**New Diagnosis**
OSAS	30	2	25	0
Hypertension	31	6	20	1
Diabetes	16	2	14	0

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ORIGINAL CONTRIBUTIONS

Patient-Reported
Single-Anastomos
(SADI-S): a Cross-S
Institution

Victor Admella[1] · Claudio La
Javier Osorio[1]

Conclusion

This single-institution cross-sectional study demonstrated that weight control is the main factor related to long-term QOL after SADI-S. Incidence of GERD symptoms and loose stools was up to 30% in patients with > 3 years follow-up. Monitoring postoperative patient-related symptoms with validated objective tests seems a feasible and useful resource for the long-term follow-up of patients submitted to SADI-S.

Table 3 Physical quality of life of patients submitted to SADI-S

Variables		Total $n=246$	Physical quality of life PCS ≥ 50 $n=131$	PCS < 50 $n=115$	p
GERD ≥ 8, *n* (%)		56 (22.8)	26 (19.9)	30 (26.1)	0.244
Bristol 1 & 2 (constipation), *n* (%)		29 (11.8)	13 (9.9)	16 (13.9)	0.333
Bristol ≥ 5 (diarrhea), *n* (%)		49 (19.9)	30 (22.9)	19 (16.5)	0.211
BMI < 35 kg/m^2, *n* (%)		143 (58.1)	99 (75.6)	44 (38.3)	**0.000**
BMI, mean (SD)		36.5 (9.9)	31.9 (6.7)	41.7 (10.5)	**0.000**
Supplementation needs, *n* (%)		91 (50.8)	65 (52.9)	26 (46.4)	0.426
Associated medical problems	HTN, *n* (%)	132 (53.7)	70 (53.4)	62 (53.9)	0.940
	DLP, *n* (%)	54 (22.0)	27 (20.6)	27 (23.5)	0.588
	T2D, *n* (%)	80 (32.5)	37 (28.2)	43 (37.4)	0.127
	OSA, *n* (%)	93 (37.8)	46 (35.1)	47 (40.9)	0.353

ate statistical significance

		Total $n=246$	Mental quality of life MCS ≥ 50 $n=129$	MCS < 50 $n=117$	p
		56 (22.8)	26 (20.2)	30 (25.6)	0,305
ipation), *n* (%)		29 (11.8)	18 (14.0)	11 (9.4)	0.269
), *n* (%)		49 (19.9)	25 (19.4)	24 (20.5)	0.824
%)		143 (58.1)	86 (66.7)	57 (48,7)	**0.004**
		36.5 (9.9)	34.4 (8.9)	38.7 (10.6)	**0.001**
problems	HTN, *n* (%)	132 (53.7)	67 (51.9)	65 (55.6)	0.570
	DLP, *n* (%)	54 (22.0)	21 (16.3)	33 (28.2)	**0.024**
	T2D, *n* (%)	80 (32.5)	43 (33.3)	37 (31.6)	0.775
	OSA, *n* (%)	93 (37.8)	51 (39.5)	42 (35.9)	0.557

Values in bold indicate statistical significance

SADI-S
PROs & CONs

EXCELLENT WEIGHT LOSS RESULTS	POST-OPERATIVE MALNUTRITION
VERY GOOD COMORBIDITIES CONTROL	NEED FOR ENTIRE LIFE SUPPLEMENTATION
GOOD REVISIONAL PROCEDURE AFTER SLEEVE	SURGICAL TECHNIQUE
QUALITY OF LIFE (BMI & COMORBIDITIES CONTROL)	REFLUX
	LOOSE STOOLS - QUALITY OF LIFE (?)
	EXTENSIVE MULTI-DISCIPLINARY FOLLOW-UP

Take Home Message

- Do we have an alternative procedure with comparable results and less long-term consequences? Might this procedure be better?

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SANTIAGO 2025

THANK YOU