

Tratamiento quirúrgico de la superobesidad: resultados de la estrategia en dos etapas del SADI-S

Surgical Treatment of Superobesity, Results of the Two-Stage Strategy of SADI-S

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Abstract

SADI-S is a simplified version of the Duodenal Switch, combining a single anastomosis between the duodenum and ileum with a sleeve gastrectomy. For patients with a body mass index (BMI) over 50 kg/m², a two-stage approach can be used, starting with the sleeve followed by the SADI procedure. This retrospective, observational study aims to evaluate how the time between the two surgical procedures affects the patient's outcome at the end of the first-year follow-up, after the last surgery. 25 patients, with a mean age of 43.04 years and a mean initial BMI of 56.83 Kg/m², were included in this study. The time between surgical interventions varied from 212 to 872 days. The percentage of excess weight loss (%EWL) was, on average, 72.29% in the first year of follow-up and was inversely correlated with the time elapsed between interventions (Spearman's $\rho = -0,596$, $p = 0,007$). In terms of controlling metabolic comorbidities, 56% of patients achieved total remission. In conclusion, dividing SADI-S into two stages, first performing the sleeve, induces weight loss and metabolic health, making the later bypass safer. A shorter time between surgeries may lead to greater weight loss, but more research is needed to determine the best timing.

Keywords: SADI-S, metabolic surgery, superobesity

Introduction

The Single Anastomosis Duodeno-Ileal bypass with Sleeve Gastrectomy (SADI-S) appears as a simplification of the biliopancreatic diversion (BPD) procedure with duodenal switch (DS). It was first described by Sánchez-Pernaute and Torres in 2007 [1] and it consists of a single anastomosis between the first portion of the duodenum and the ileum, associated with a vertical gastrectomy (sleeve), preserving the antrum and pylorus. This technique has shown itself to be safe and to offer substantial weight loss, improving metabolic health and reducing comorbidities [2, 3]. In patients with a body mass index (BMI) greater than 50 Kg/m², a two-stage surgical strategy can be chosen, starting with the sleeve and subsequently SADI [4, 5].

As the ideal timing for the second procedure is still a matter of debate, the aim of this study is to determine the optimal time between the two surgeries.

Materials and methods

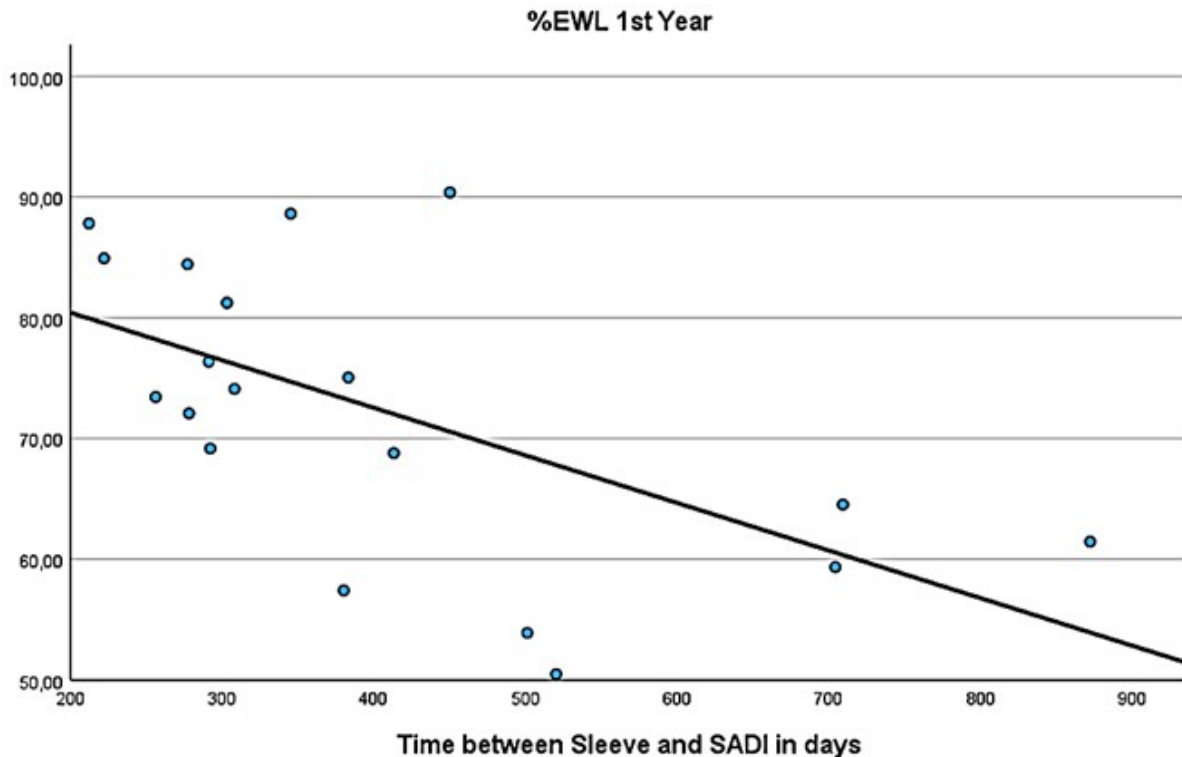
In this retrospective, observational study were included a total of 25 patients, 10 men and 15 women, that underwent SADI-S between January 2021 and December 2023. All patients' details were anonymized. In all cases, the sleeve was performed using a 36Fr *Fouchet* probe and the duodeno-ileal anastomosis was performed at 250 cm from the ileocecal valve. The patients' age ranged from 20 to 64 years, with a mean age of 43.04 years. The individual's BMI, calculated based on the maximum weight prior to surgery, was between 49.96 and 74.11 Kg/m² with the average being 56.83 Kg/m². The time passed from the first procedure to the second was, on average, 450.24 days, the minimum being 212 days and the maximum 872 days.

For the statistical analysis, Spearman's Correlation test and Mann-Whitney U test were used, with $p < 0.05$ being considered significant. A simple linear regression was also performed. Analysis was performed using the IBM SPSS version 29.

Results

The BMI went from 56.83 Kg/m^2 ($sd=5.633$), preoperatively, to 33.54 Kg/m^2 ($sd=4.423$) one year after SADI-S. The %EWL at the first-year follow-up was, on average, 72.28% ($sd=12.142$).

A simple linear regression was conducted to determine the relationship between the time passed from the sleeve gastrectomy to the SADI procedure, as seen in Figure 1. The results indicate a moderate but statistically significant ($p=0.007$) relationship between the two, with the regression explaining 35.1% of the variation in %EWL ($R^2=0.351$). The regression shows a negative slope ($b=-0.039$), which means that for each additional day between the two procedures, the %EWL decreases by 0.039% . Using Spearman's Correlation test, it was determined that the two variables are inversely proportional ($\rho=-0.596$). All this suggests that the shorter the time spent between the sleeve and the SADI, the greater the %EWL will be.



To try to find an ideal time in which the second procedure should be performed, a Mann-Whitney U test was carried out. To make this possible, the sample was divided into two groups: the first comprised patients who had undergone the second surgery less than 365 days after the first, while the second consisted of those with a time interval greater than 365 days. In the first group were then included 10 patients and the %EWL was 79.2% ($sd=7.04$). In the second, the remaining 15 were included and the %EWL was 65.6% ($sd=12.22$). The result was statistically significant ($p=0.011$), meaning that the groups differ in a meaningful way which suggests that results are better if the SADI procedure is performed under a year after the sleeve gastrectomy.

Regarding comorbidities, this study highlighted a decrease in the prevalence of conditions such as diabetes type 2, arterial hypertension, dyslipidemia, and obstructive sleep apnea syndrome. As seen in Table 1, the percentage of patients with these comorbidities reduced significantly over the first year, with 56% of patients achieving total remission, evidenced by the complete stopping of their treatment. This reflects the potential impact of the procedure on

managing these conditions and shows the improvement in patients' health post-intervention.

Comorbidities	Preoperative	1st year follow-up
Diabetes type 2	9 (36%)	1 (4%)
High blood pressure	17 (68%)	6 (24%)
Dyslipidemia	10 (40%)	5 (20%)
Obstructive Sleep Apnea Syndrome	9 (36%)	6 (24%)

Table 1 - Preoperative comorbidities and their changes at first-year follow-up

Discussion

Firstly, it is important to note that, in certain cases, the interval between procedures was extended due to these patients being classified as high surgical risks during the SARS-CoV-2 pandemic. This explains instances where patients faced delays of over 700 days before undergoing the second procedure.

SADI-S has emerged as a promising bariatric surgical option, offering significant weight loss, as Sanchez-Pernaute et al. reported in 2010 [6], where the %EWL a year after SADI-S was 94.7% and it remained unchanged over the second and third year. In Hinali Zaveri et al. [7] SADI-S also appears to be a safe and effective procedure, with the %EWL at 4 years being 85.7%.

It is important to note that the present study only included patients who had a two-stage SADI-S, however this procedure can also be done as a primary surgery. According to Alexis Deffain et al. [8] primary SADI-S was offered to

patients with an initial BMI over 50 Kg/m², whereas the two-stage strategy was prioritized in patients with comorbidities or high surgical risk, as well as patients with a BMI greater than over 60 Kg/m². Alexis Deffain et al. concluded that both strategies are effective in achieving good short and mid-term results. However, it was demonstrated that the %EWL during the first-year follow-up was greater in the one-stage SADI-S procedure compared to the two-stage strategy. This could explain why the %EWL observed in this study was lower than those reported in the literature.

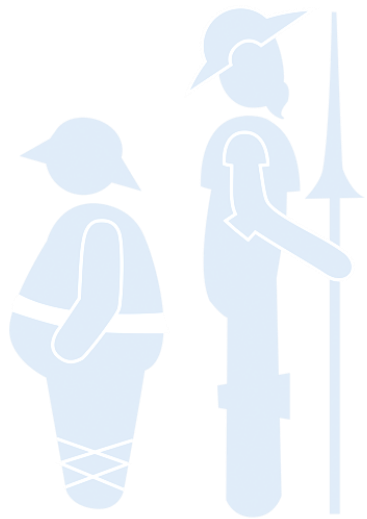
Lastly it is relevant to compare SADI-S to a standard sleeve gastrectomy and to explore the reason behind adding a malabsorptive component. Studies such as Picard Marceau et al. [9] and Austin Cottam et al. [10], show that early weight loss is primarily attributed to the gastric component, however, the intestinal component is crucial for long-term weight loss.

Conclusion

Performing SADI-S in two surgical stages allows the patient's metabolic state to improve and induces weight loss before performing the second procedure, the duodenal-ileal bypass, technically more challenging. This study's findings indicate the weight loss is greater the shorter the time between the two interventions, highlighting the importance of minimizing the delay for optimal results. However, despite the promising results, it is important to note that the sample used is small, only 25 patients. This must be considered when interpreting the results, as it may affect the applicability of the conclusions.

The authors declare no conflicts of interest.

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