



THE OUTCOME OF TWO TECHNIQUES OF GASTRIC BYPASS ON THE MANAGEMENT OF OBESITY COMORBIDITIES

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Abstract

Background: Bariatric surgery, regardless of its type, is the most effective approach for treating morbid obesity. This study aimed to compare the outcome of SASI bypass with that of RYGB regarding weight loss and improvement in diabetes and dyslipidemia.

Methods: patients with morbid obesity who underwent RYGB or SASI bypass were monitored for 6 months. Between a group of patients who underwent SASI bypass on consecutive occasions and a group of patients who underwent RYGB during the same study period, weight loss and improvements in comorbidities were compared.

Conclusion: There were no significant differences in the remission of comorbidities; blood glucose and dyslipidemia between the two groups.

Keywords: Bariatric; bypass; cholesterol; dyslipidemia; obesity; Roux en Y; SASI

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INTRODUCTION

Diseases including diabetes, heart disease, and cancer that are linked to obesity have recently emerged as urgent public health issues worldwide (Vucenik and Stains 2012, Hruby and Hu 2015). A significant number of obese patients are not adequately controlled by medical treatment (Hruby and Hu 2015), so bariatric surgery, regardless of kind, treats morbid obesity. (Sayadishahraki, Rezaei et al. 2020). Bariatric surgery depends on mainly two strategies to lose weight, even restriction of the amount of food taken by the stomach or bypasses part of the small intestine and hence malabsorption such strategies make bariatric surgery a potential cause for complications (Mahdy, Al wahedi et al. 2016)

Today, Roux-en-Y gastric bypass (RYGB) is a common method in the field of bariatric surgery (Seeras, Sankararaman et al. 2022). The laparoscopic Roux-en-Y gastric bypass (LRYGB) is the most well-known and successful weight-loss surgery currently available (Kraljević, Delko et al. 2017). However, LRYGB is associated with both early postoperative like complications leakage, hemorrhage, and obstruction and late complications like fistula, stricture, malnutrition, and weight gain (Griffith, Birch et al. 2012).

The single anastomosis sleeve ileal (SASI) operation is considered an innovative operation based on two known techniques; the mini gastric bypass and Santoro's operation and it consisted of two main steps; sleeve gastrectomy followed by gastro-ileal anastomosis. (Mahdy, Al wahedi et al. 2016). It's considered a promising operation, the results of this operation are as good as those obtained after the duodenal switch but without the malabsorption (Mahdy, Al wahedi et al. 2016) Results from the SASI operation have been promising, with better weight loss and fewer problems compared to the sleeve gastrectomy and one-anastomosis gastric bypass (Mahdy, Gado et al. 2021). The purpose of this study was to evaluate the effectiveness of two bariatric surgery approaches; we compared the results (RYGB) bypass with those of (SASI) bypass in terms of weight loss, improvement in comorbidities, and malnutrition.

PATIENTS AND METHODS

Patients who had RYGB or SASI were enrolled in the current study. Patients were compared one year after having gastric bypass surgery (either RYGB or SASI). To avoid confounding effects, both groups were matched in age and sex and baseline clinical

characteristics like weight measurement and comorbidities Patients were gathered from the Hospital's surgical ward. All participants provided written informed consent before enrollment after the study's goals were outlined.

Patients' allocation: About 21 cases of SASI and 21 cases of Roux en Y were enrolled. All patients who were admitted for bariatric surgery and fulfilled the inclusion criteria were invited to participate in the study.

Grossly overweight morbidly obese patients (BMI 40 kg/m² or 35 kg/m² with at least one related medical comorbidity) ranging in age from 18 to 60 years old were included in the current study. While patients with endocrine-related obesity, severe mental illness, and those with an ASA score of III or above were not eligible for participation.

Method of choice of Surgery type: Patient's preference after proper medical consultation of advantages and disadvantages of each procedure.

METHODS

Group (1) RYGB

Roux-en-Y gastric bypass (RYGB) entails the construction of a gastric pouch, a biliopancreatic limb, a jejunojejunostomy, and a gastrojejunostomy.

Group (2) SASI

Devascularization of the greater curvature of the stomach till the gastroesophageal junction. The stomach was then tabularized over a 36-French calibration tube. The ileocecal junction is identified, and 300 cm is measured upwards. The selected loop is ascended and stapled side to side 6 cm away from the pylorus.

Leak test after any of the two techniques: The methylene blue test is used to ensure a successful anastomosis.

Post-Operative:

A low-calorie, protein-rich liquid diet was prescribed, and patients were instructed to take nutritional supplements for the first month following surgery. In addition, multivitamins including (vitamin D3:3000-10000 IU daily, vitamin B1:10-50 mg daily, vitamin B12: 1000mcg monthly IM or sublingual, iron18-60mg daily, calcium:1000-1200mg daily and multivitamins containing a recommended dose of zinc, folic acid, and vitamin c) was prescribed. Patients were encouraged to exercise from week one.

Statistical analysis of data

The collected data were coded then entered and analyzed using the SPSS version 25 (Statistical Package for social science). Data were described using mean and standard deviation for numerical variables or count and percentages for categorical variables. We test the statistical difference among the studied groups using the proper statistical tests. Statistically significant P-values were 0.05 or less.

Results

Age, sex, height, weight, BMI, and comorbidities were similar both groups (Table 1). The total number of diabetic cases in both groups was 20 cases. Ten cases underwent Roux en Y operation, and 10 cases underwent SASI operation.

When comparing the two groups; the mean of FBG and HbA1C were not significantly different between both groups (table 2). Both groups had similar cholesterol and triglyceride levels 3 and 6 months postoperatively (table 3).

Discussion:

The current study reports on the SASI method's effectiveness in contrast to the Roux en Y treatment. The primary finding was the lack of a statistically significant change in weight or excess body weight loss after six months or twelve months following surgery. Diabetes, HTN, or dyslipidemia did not differ between the two surgical procedures in a way that was statistically significant. No malnutrition was found in either group's nutritional status postoperatively, with the exception of one case in the SASI group.

Weight loss in the two groups:

The lack of a statistically significant variation in weight measurements following surgery between the two procedures supports the idea that both treatments have identical effects.

In the current study, weight loss was maintained for a year with both approaches and was acceptable compared to other bariatric procedures.

However, the Roux en Y group's EBWL percentage was slightly lower than that of the literature, at 59.5% at 12 months as opposed to 75% in a research by Roux en Y. (Hatoum, Stein et al. 2009) and 70% by (Yaghoubian, Tolan et al. 2012).

The SASI group saw immediate weight loss, which was larger than that recorded with other bariatric surgeries and was sustained throughout the follow-up (Tarnowski, Barski et al. 2022)

Similar to the finding of our study, a systematic review by (Emile, Mahdy et al. 2021) concluded that in terms of weight loss, SASI is not inferior to other procedures, including Roux en Y. Emile's research compared SASI bypass with other bariatric procedures, such as the Roux en Y operation, and found that at six and twelve months after surgery, the median preoperative body weight in SASI considerably lowers. In contrast to the SASI group, where the mean%EBWL at 6 months was 59.4% and greatly rose to 90.1% at 12 months, the mean%EBWL in the current trial was 48% and significantly increased to 66.2%.

Improvement in comorbidities (DM, HTN, and dyslipidemia):

These findings corroborated those of Mahdy et al. (2016), who found a significant difference in FBG, HbA1c, cholesterol, and TGs between before and after surgery (Mahdy, Al wahedi et al. 2016). Furthermore, Khalil and Mansy et al., (Khalil, Mansy et al. 2019) found that the SASI had significantly lower fasting blood glucose and HbA1C over the first year postoperatively. However bariatric surgeries have been demonstrated to be an efficient method to treat DM, HTN, GERD, and dyslipidemia (Mahdy, Al wahedi et al. 2016, Emile, Mahdy et al. 2021) Those based on malabsorptive bases are more promising (Mahdy, Al wahedi et al. 2016). Given the tiny size of the stomach, SASI bypass lowers calorie intake and quickens chyme entrance into the distal intestine, which increases the distal gut's nutrient stimulation. This might be the reason why most diabetic cases got better. In this particular investigation, there were little differences in the rate of diabetes remission between the SASI and Roux en Y groups. In terms of other preoperative comorbidities, this study's findings were consistent with those of

another research study on SASI operations; in that research, which contrasted SASI operations to sleeve gastrectomy, the author studied 58 cases in the SASI group and found that remission of hypertension and dyslipidemia was reported in 57.1% (8/14) of cases and 87.5% (7/8) of cases, respectively.

Conclusion:

The short-term effectiveness of the SASI bypass was shown to be high in the current investigation. When comparing weight loss, comorbidity improvement, malnutrition, and postoperative complications, SASI is on par with Roux en Y, the gold standard of bariatric surgery.

The SASI bypass improved DM, and dyslipidemia after 6 months without much inferior weight loss results. The procedure proved safe short term. However, the SASI operation began five years ago. More research is needed to reflect the current state and outcomes of SASI and fill the literature gaps on its long-term effects. These findings and lengthier follow-ups support SASI bypass as a metabolic surgery option.

Tables and figures

Table (1): Baseline characteristics of the studied cases in the two groups:

Variable	Type of operation		P-value
	Roux en Y (N.30)	SASI (N.30)	
Age (Mean ± SD)	35.4± 5.6	40.8±10.2	0.265
Height in meters (Mean ± SD)	1.67±0.09	1.65±.07	0.069
Weight in Kg (Mean ± SD)	127±27	142±23	0.420
BMI (Mean ± SD)	44.07±7.45	49.92±6.20	0.320

§: p-value couldn't be statistically calculated

Table (2): Comparing fasting blood glucose and HB A1C levels between the two groups.

Measurement	Roux en Y		SASI		P value
	Mean	SD	Mean	SD	
Preoperative FBG (Normal:99 mg/dl or lower)	115.4	25.4	110.9	22.4	0.142
FBG 6 ms	101.8	22.7	91.8	22.7	0.121
FBG 12 ms	83.4	21.5	86.5	21.5	0.959
P value	0.049*		0.041*		----
Preoperative HA1C (normal: below5.7%)	7.4	1.1	7.3	1.5	0.765
HBA1C 6 ms	5.8	1.2	5.8	1.2	0.156
HBA1C 12 ms	5.2	0.3	5.2	0.3	0.142
P- value	0.043*		0.001*		----

FBG; fasting blood glucose, HA1C; Hemoglobin A1C. Note: The measurement of HbA1C, ms: month

Table (3): Comparing cholesterol and triglyceride level between the two groups.

Measurement	Roux en Y		SASI		P-value
	Mean	SD	Mean	SD	
Preoperative Cholesterol (Normal less than 200 mg/dl)	191.3	45.8	181.3	48.8	0.092
Cholesterol 6 ms	161.3	41.5	157.3	43.5	0.071
Cholesterol 12ms	143.5	34.8	140.5	38.1	0.059
P-value	0.039*		0.001*		----
Preoperative TGS (Normal less than 150 mg/dl)	125.5	34.1	115.5	37.8	0.065
TGS 6 ms	99.4	28.1	96.4	29.7	0.056

TGS 12 ms	81.9	23.4	82.6	25.4	0.342
P-value	0.044*		0.035*		----

TGS; triglyceride, HDL; high-density lipoprotein, LDL; low-density lipoprotein, ms: month

Case presentation (1)

Male patient 27 years underwent Reux enY gastric byass

Weight before surgery 120 kg, length 177cm with BMI:38.7

Complaining type 2 DM with impaired glucose tolerance Hb A1c 6.99, intermittent GERD, ex-smoker, ultrasound: mild steatosis.

There was no hypertension or dyslipidemia, accepted physical activity can climb 3flights of stairs.

Previous trials of diet to reduce weight.

Complications: post operative abdominal distension, fever and respiratory tract infection the patient transmitted to intensive care unit ,CT and gastro giraffine follow through study showed jejunojejunosotomy obstruction with gastricremenant dilatation. Fig 1

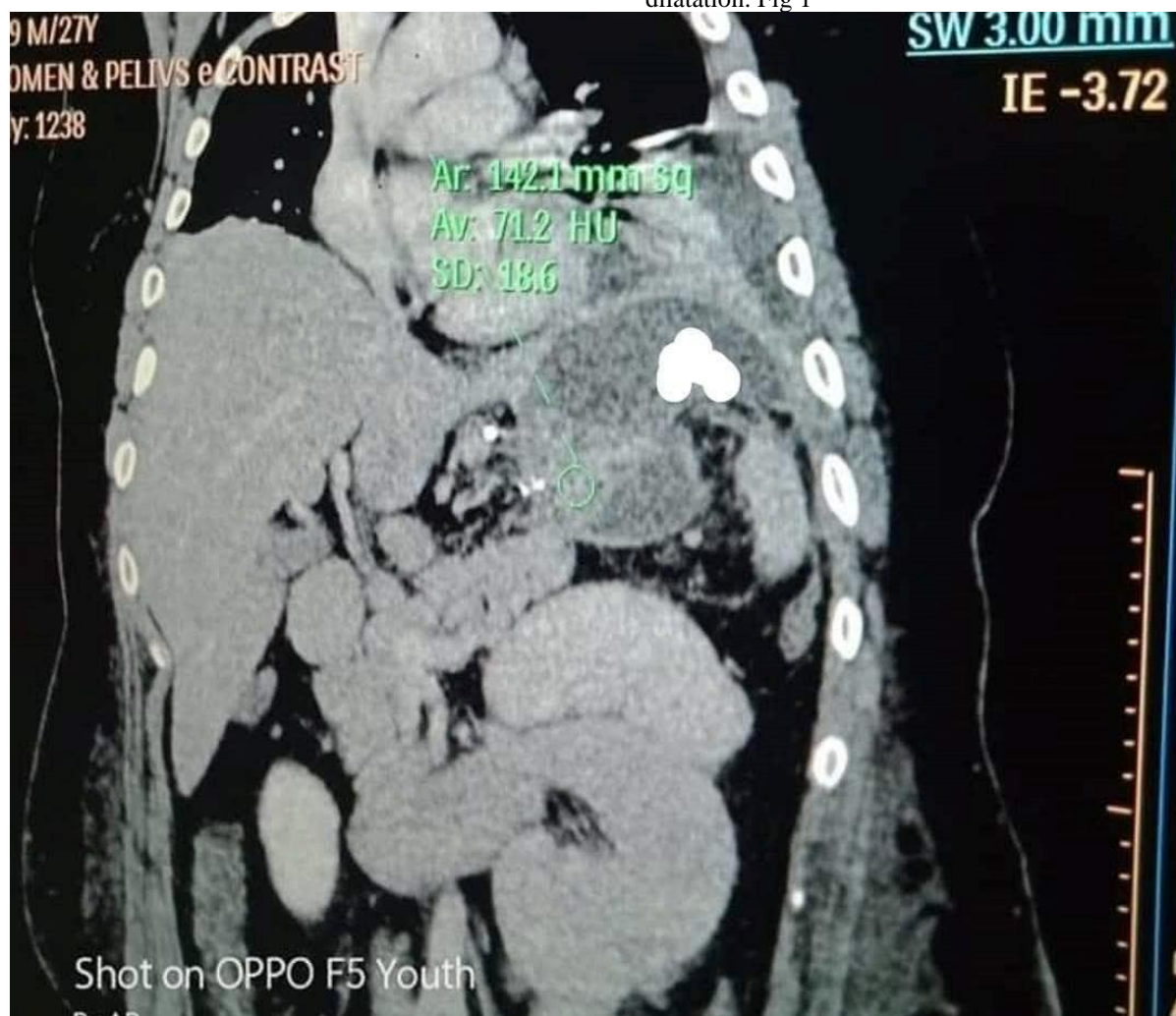


Fig. 1 jejunojejunosotomy obstruction with gastric remnant dilatation

Follow up of the patient that re exploration was done.

Improvement of the patient and discharge through 20 days from the primary operation.

Follow up of the patient:

improvement of both diabetes mellitus and GERD measures at 6months follow up: weight;84.5 height;177 BMI;27.

%EWL:70%

Measures at 12 months follow up: weight;77.8 height;177 BMI;24.9.

%EWL:86%

Case presentation 2

Female patient 26 years underwent SASI bypass Weight before surgery 137 kg, length 160cm with BMI:53.5

Complaining type 2 DM Hb A1c 7.3, dyslipidemia, ultrasound: mild steatosis and hypoalbuminemia serum. Alb 3.2 preoperatively.

There was no hypertension and reduced physical activity was obvious can't climb one stair of flight.

Previous trials of diet to reduce weight. Intraoperative all small intestinal length was 8 meters, so anastomosis was done 3 meters from ileo caecal valve and 5 meters from DJ junction that was done aiming to reduce hypoalbuminemia and protein energy malnutrition postoperatively. Complications: 3 months post operative there was attacks of recurrent vomiting and hematemesis as described, upper GI endoscopy was done revealed gastritis

At 6 months follow up; the patient presented with abdominal pain, bilateral lower limb edema, hypoalbuminemia:2.6 and elevated liver enzymes (ALT:123 AST:45) .

Decision was to convert it to sleeve gastrectomy to avoid that protein energy malnutrition as the patient was not fulfilling the accurate regimen of vitamins a caloric intake and it was hard for her to continue.

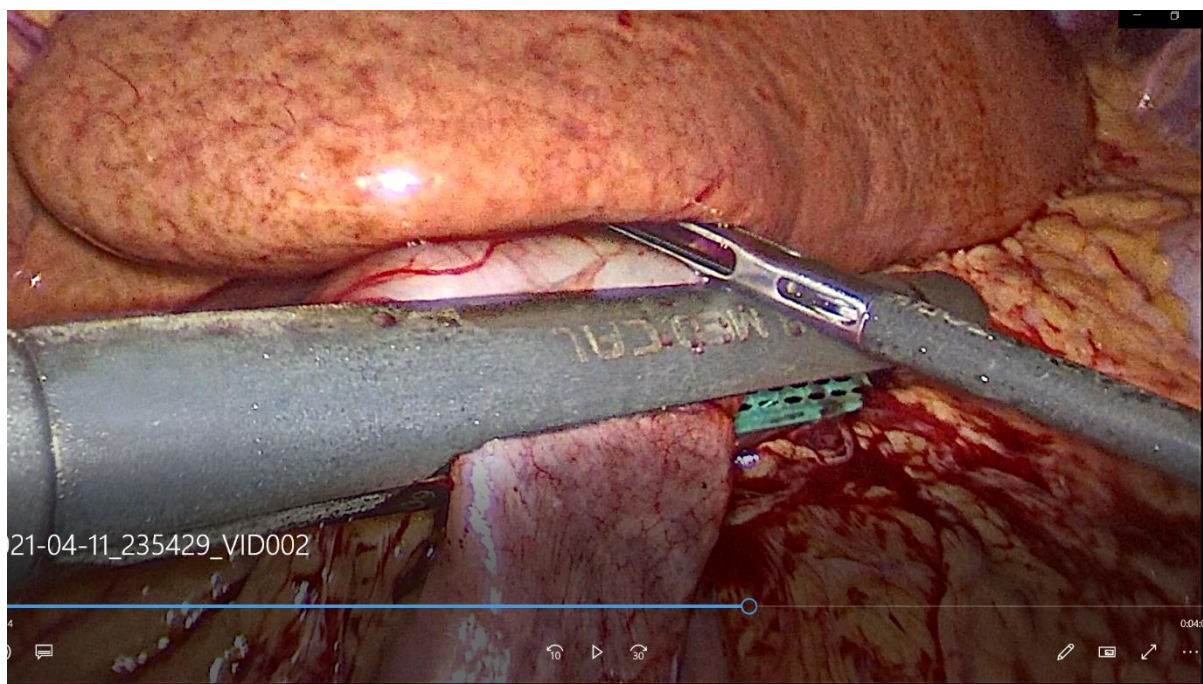


Fig 2 Separation of sleeve-ileal anastomosis.

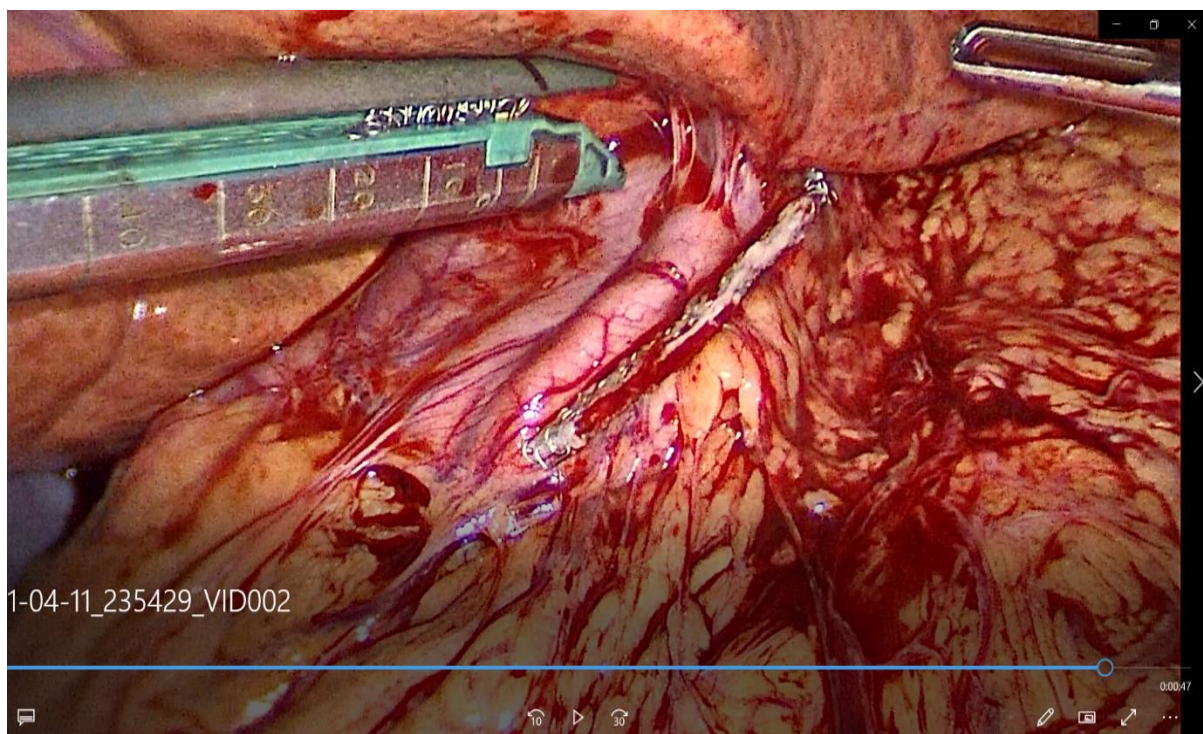


Fig 3 Separated sleeved stomach

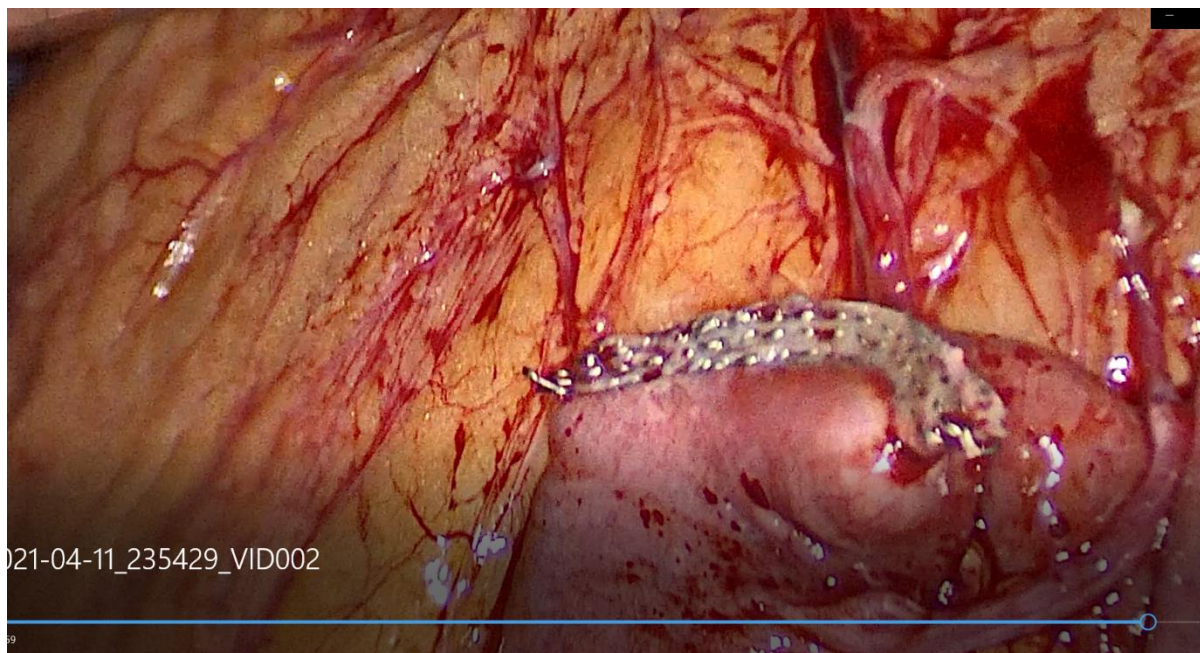


Fig 4 separated ileum

Follow up of the patient:
improvement of both diabetes mellitus and
dyslipidemia.

Measures at 6months follow up: weight;96
height;160 BMI;37.5
%EWL:49%.

Measures at 12 months follow up: weight;84
height;160 BMI;32.8.
%EWL:64%.

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of the study, collected data, contributed to the
statistical analysis of the data, and wrote the first
draft, T.M.N conceived the idea of the study, and
substantively revised the work. All other authors
were involved in the acquisition of data and revised
the work. All authors approved the submitted
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