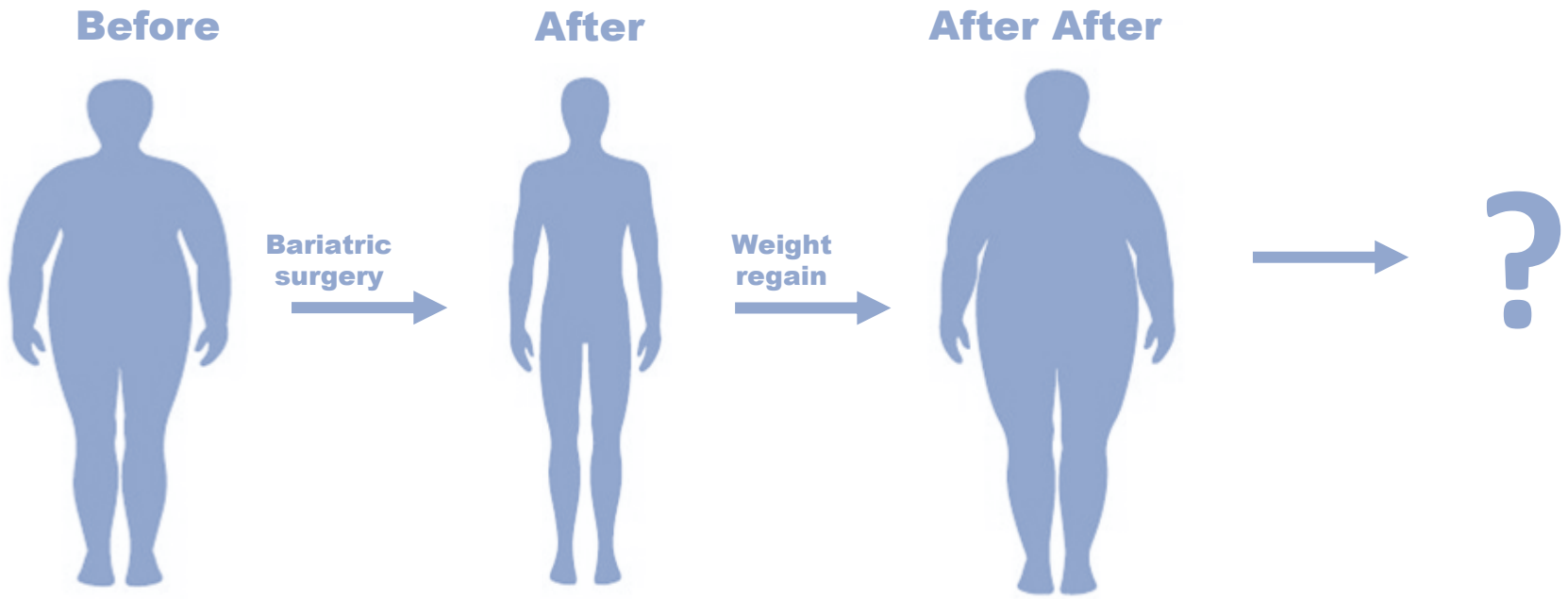
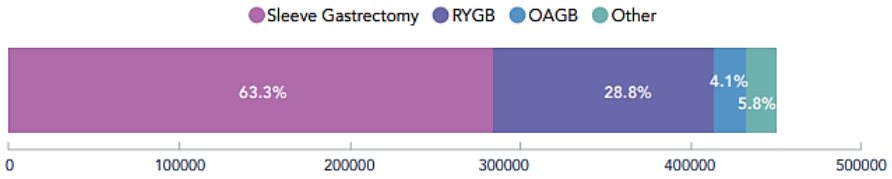
Revision for Recurrent Weight Gain – Conversion to SADI

Dr Muffazal Lakdawala – Sir H N Reliance Foundation Hospital and Research Centre, Mumbai, India.



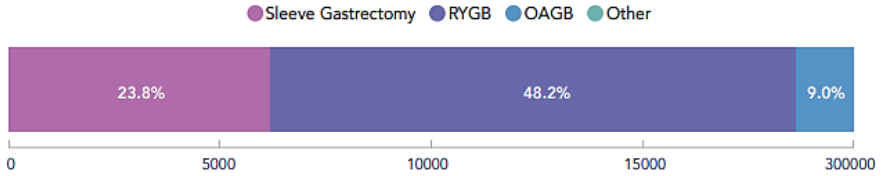
I have no potential conflict of interest to report

Primary procedures



Primary procedure types (n=449,583). *potential for procedures to be represented twice due to possible overlaps with the datasets of USA and Michigan

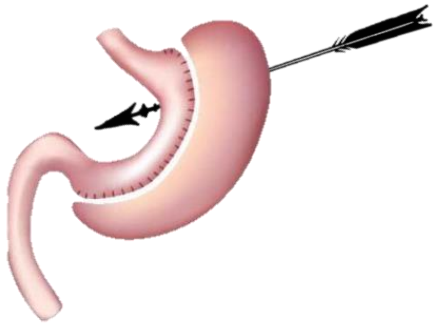
Revisional procedures



Revisional procedures (n=19,814). For all countries apart from the USA (n=5,435 excluded from analysis as no breakdown provided).

(8th IFSO Global Registry, 2023)

- Significant drawbacks of this procedure are the development of **de novo GERD and weight regain**



- **Up to 30%** of LSG patients may require revision surgery for reflux esophagitis or weight regain.

- Systematic review by Lauti and colleagues observed that rates of regain ranged from **5.7 % at 2 years to 75.6 % at 6 years.**

- Sepúlveda and colleagues observed a failure rate at 5yrs is 30.4% and 7yrs is 51.4%.

- Proposed causes of weight regain included initial sleeve size, sleeve dilation, increased ghrelin levels, inadequate follow-up support and maladaptive lifestyle behaviours.

(Lauti, M. et al. 2016; Lee, W. J, et al. 2017; Sepúlveda M., 2017)

Assessment of the Failure Rates of Sustainable Weight Loss after Sleeve Gastrectomy: A Systematic Review

Study Name	Follow Up (In Years)	Key Findings	Conclusion
Alqahtani, A.; et al. 2018	5	Patients who regained more than 50% of the weight lost following surgery were considered to have failed to achieve sustained weight reduction. According to the study, the failure rate for long-term weight loss following sleeve gastrectomy in Saudi Arabia was 25%.	According to the study, **one-quarter** of patients did not have long-term success in sustaining their weight loss following surgery.
Albeladi, B.; et al. 2022	5	In Saudi Arabia, the failure rate of long-term weight reduction following sleeve gastrectomy was 23.1% after 5 years.	Almost **a quarter** of individuals were unable to sustain their weight decrease long after surgery.
Courcoulas, A.P.; et al. 2014	5	The study discovered that the failure rate for long-term weight reduction after sleeve gastrectomy in the United States was 30%.	According to the study, roughly **one-third of patients** did not maintain their weight decrease following surgery.
Singh, S.; et al. 2020	3	The failure rate of long-term weight reduction was defined as patients who recovered more than 30% of their lost weight during the first year after surgery. The study found that 25% of individuals who underwent sleeve gastrectomy in India failed to achieve long-term weight reduction	According to the study, **one-quarter of patients** did not have long-term success in sustaining their weight loss following surgery.

(Mohamed, A.M.M; Faisal, M. S. Al-Dour; & Eman, I. A.O, 2024)

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Assessment of the Failure Rates of Sustainable Weight Loss after Sleeve Gastrectomy: A Systematic Review

Study Name	Follow Up (In Years)	Key Findings	Conclusion
Choudhary, D.; et al. 2018	5	According to the study, 30% of patients in India failed to achieve long-term weight loss following sleeve gastrectomy.	According to the study, approximately **one-third of individuals** did not lose weight successfully over time.
Maghrabi, R.A.; et al. 2020	5	The study discovered that the failure rate of long-term weight loss after sleeve gastrectomy in London was 30%, with 45 of 150 patients failing to lose the necessary weight	Approximately **one-third of patients** did not achieve good long-term weight reduction maintenance following surgery.
Elbanna, H. et al. 2020	3	The study found that 35% of patients in Egypt failed to achieve sustainable weight reduction following sleeve gastrectomy, with just 65% effectively sustaining the required weight loss during a three-year follow-up period.	The study participants had a **greater failure rate**, with just 65% successfully maintaining the goal weight decrease. The failure rate of long-term weight loss after sleeve gastrectomy in the United States was reported to be 15.5% 5 years after surgery.

Weight maintenance remains a challenge post Sleeve Gastrectomy.

(Mohamed, A.M.M; Faisal, M. S. Al-Dour; & Eman, I. A.O, 2024)

METHODS

- Consecutive SG performed from 2008 to 2017, with follow-up ≥ 5 years.
- Surgical non-response (NR) was defined as < 20% of %TBWL.
- Weight recurrence (WR) defined as >20% weight regain from nadir post-operative weight.

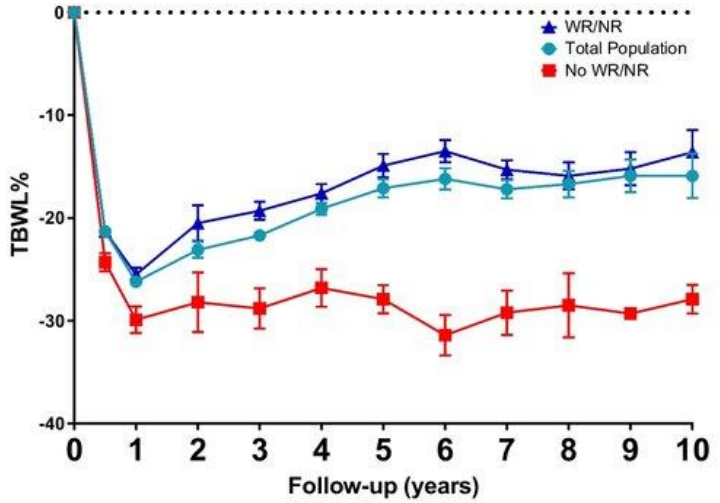
Weight Loss (TBWL%)

No WR/NR ✖ WR/NR

6 months → **Follow-up up to** → 10 years

RESULTS

- 79.9% of patients were NR/WR
- HTN and T2DM were more prevalent in NR/WR group.
- TBWL% at 1 year was greater in No NR/WR group (25.5 vs 29.9; p=0.005).



Follow-up (Years)	0	0.5	1	2	3	4	5	6	7	8	9	10
Total population (n)	1263	632	846	569	448	359	277	220	193	95	59	36
WR/NR (n)	271	193	205	176	178	163	185	187	166	90	56	33
No WR/NR (n)	68	40	42	40	35	36	35	33	27	5	3	3

Long-term %TBWL follow-up comparison between total population, no WR/NR, and WR/NR groups

(Lind, R.; et al. 2023)

Review > Obes Surg. 2016 Jun;26(6):1326-34. doi: 10.1007/s11695-016-2152-x.

Weight Regain Following Sleeve Gastrectomy–a Systematic Review

Melanie Lauti [1], Malsha Kularatna [2], Andrew G Hill [2], Andrew D MacCormick [2]

Rates of regain ranged from 5.7 % at 2 years to 75.6 % at 6 years.

Review > Obes Surg. 2021 Apr;31(4):1755-1766. doi: 10.1007/s11695-020-05160-5. Epub 2021 Feb 8.

Weight Regain and Insufficient Weight Loss After Bariatric Surgery: Definitions, Prevalence, Mechanisms, Predictors, Prevention and Management Strategies, and Knowledge Gaps–a Scoping Review

Walid El Ansari [1 2 3], Wahiba Elhag [4]

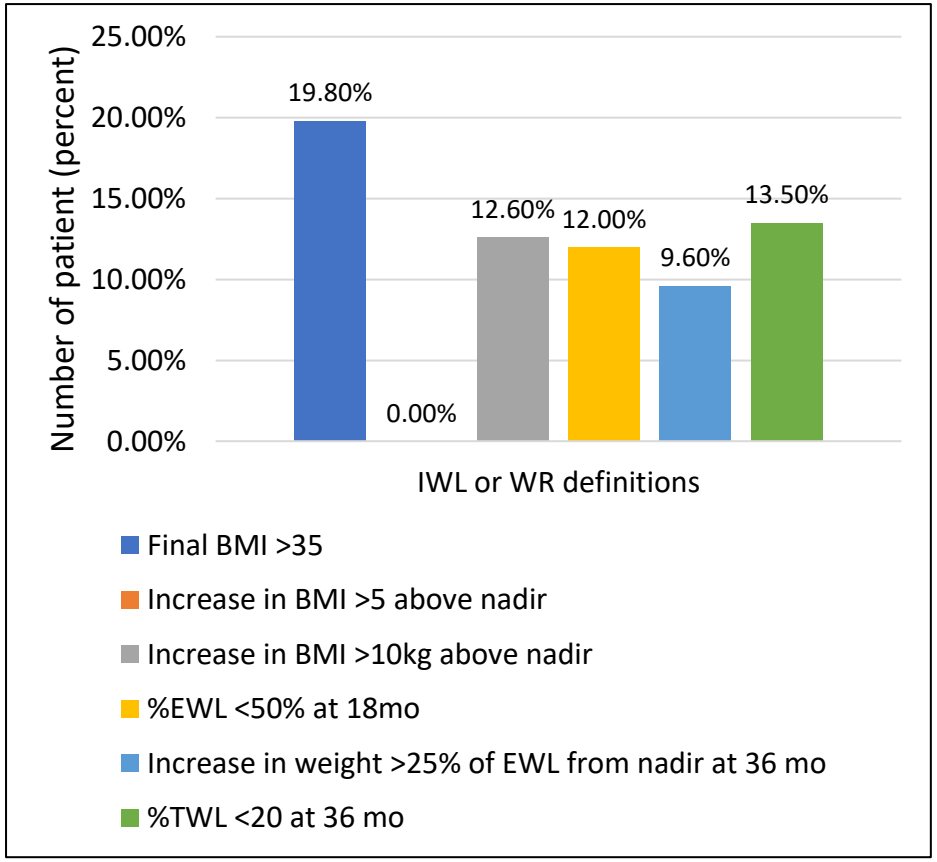
WR after laparoscopic sleeve gastrectomy (LSG) was 27.8% (range 14–37%) at long-term follow-up (≥ 7 years)

Predictors of Weight Regain and Insufficient Weight Loss According to Different Definitions After Sleeve Gastrectomy: a Retrospective Analytical Study

Fahime Yarigholi, Mansour Bahardoust, Hesam Mosavari, Farshid Monshizadeh Tehrani, Hamed Gholizadeh, Shahab Shahabi Shahmiri, Hamid Rezvani, Bahador Oshidari, Kiana Garakani & Foolad Eghbali

Obesity Surgery **32**, 4040–4046 (2022) | Cite this article

Results



WR - Weight regain; IWL - Insufficient weight loss

Conclusion

Regardless of the definition of WR or IWL

Metformin consumption had a preventative effect on WR and IWL

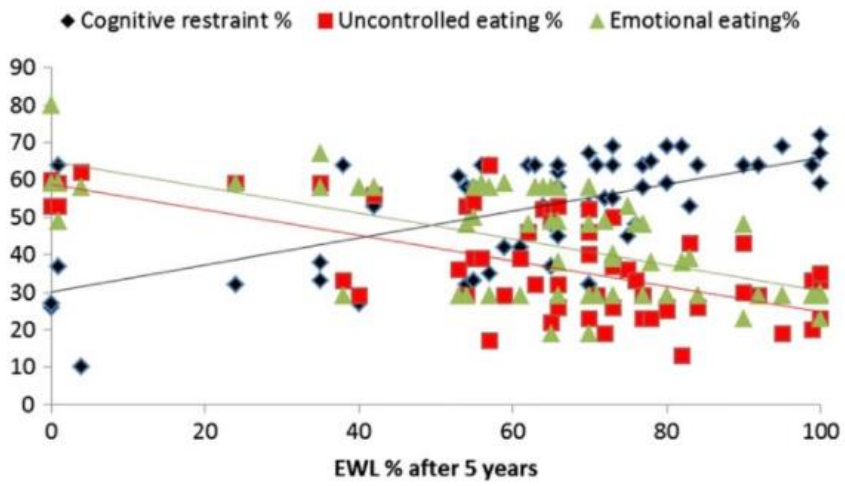
Patients with preoperative BMI of >45 kg/m2 were more likely to experience IWL or WR

Obstructive sleep apnea, and grades 2 and 3 of fatty liver disease were associated with WR or IWL.

Obes Surg. 2019 Nov;29(11):3508-3513. doi: 10.1007/s11695-019-04009-w.

Analysis of Medium-Term Weight Regain 5 Years After Laparoscopic Sleeve Gastrectomy

Ashraf A Bakr [1], Mohamed H Fahmy [1], Athar S Elward [1], Hany A Balamoun [2], Mohamed Y Ibrahim [1], Ramy M Eldahdoh [1]



Correlation between %EWL at 5 years and cognitive restraint, uncontrolled eating, and emotional eating scales of the Three-Factor Eating Questionnaire (TFEQ-R18) questionnaire

Medium-term postsurgical weight regain and unsuccessful weight loss in patients who had undergone LSG is associated with:

- Older age
- Maladaptive eating behavior
- Larger residual stomach
- Pregnancy

J Metab Bariatr Surg. 2023 Dec;12(2):35-43. doi: 10.17476/jmbs.2023.12.2.35. Epub 2023 Nov 8.

Single Anastomosis Duodeno-Ileal Bypass (SADI) as a Second Step After Failed Sleeve Gastrectomy: Systematic Review and Meta-analysis

Karim Ataya [1], Ayman Bsat [2], Abdul Hafiz Al Tannir [2], Al Moutuz Al Jaafareh [1], Amir Rabih Al [3], George Abi Saad [4]

SADI as a salvage procedure following SG yielded positive outcomes.

Mean operative time was 125.98 minutes (95% CI 102.50–149.46, I2 =99%).

Importantly, **SADI led to comorbidity resolution in a notable proportion of cases**: hypertension in 48% (95% CI 38–57%, I2 =44%), dyslipidemia in 55% (95% CI 40–69%, I2 =30%), and diabetes in 63% (95% CI 53–72%, I2 =30%) of patients.

Conclusion:

Post-operative diarrhea incidence was relatively low at 2% (95% CI 1–9%, I2 =75%).

SADI as a salvage procedure post-SG demonstrates technical feasibility and marked effectiveness.

In terms of weight loss, SADI patients exhibited substantial EWL:

47.78% (95% CI 37.86–57.61, I2 =95%) at six months

59.39% (95% CI 51.18–67.61, I2 =95%) at twelve months

25.84% (95% CI 5.76–41.92, I2=100%) at twenty-four months.

SADI is a viable option, significant weight loss, and low post-operative complication rates, notably post-operative leaks.

Further research should investigate the long-term impact of SADI on patient nutritional status to facilitate its broader adoption.

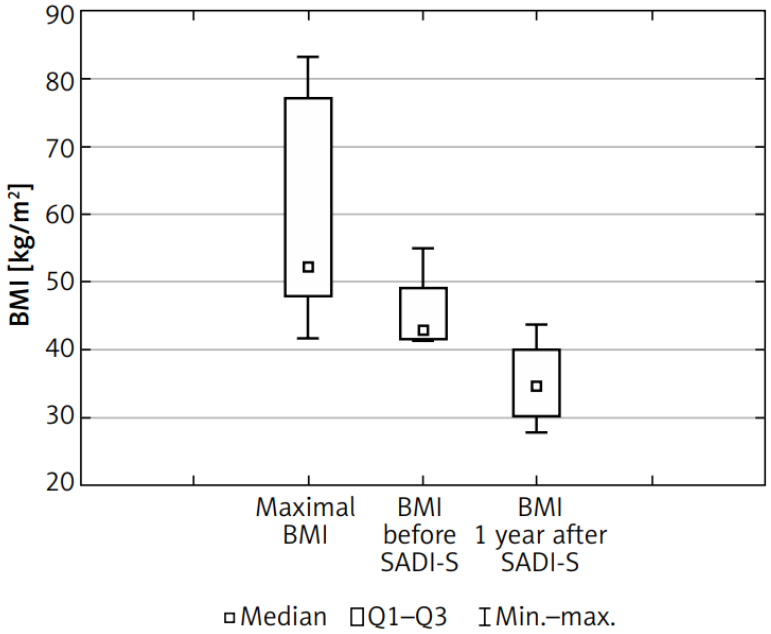
Wideochir Inne Tech Maloinwazyjne. 2023 Jun; 18(2): 298–304. PMCID: PMC10481443
Published online 2023 Jun 15. doi: 10.5114/wiitm.2023.128683 PMID: 37680742

Initial experience with laparoscopic revisional single anastomosis duodeno-ileal bypass (SADI-S) after failed sleeve gastrectomy

Michał Wysocki,[✉1] Maciej Borys,[1] Dorota Budzyńska,[1] Magdalena Pisarska-Adamczyk,[2] Piotr Małczak,[3] Anna Rajtar,[1] and Andrzej Budzynski[1]

Parameter	Value
Maximal life-time BMI [kg/m^2] median (Q1–Q3)	52.29 (47.96–77.16)
BMI before SADI-S [kg/m^2] median (Q1–Q3)	43.09 (41.64–48.99)
BMI 1 year after SADI-S [kg/m^2] median (Q1–Q3)	34.69 (30.39–40.03)
%TWL 1 year after SADI-S, median (Q1–Q3); from maximal weight	30.78% (27.12–48.84%)
%EBMIL 1 year after SADI-S, median (Q1–Q3); from maximal BMI	61.67% (50.28–80.07%)
Additional %TWL 1 year after SADI-S, median (Q1–Q3)	18.65% (17.25–21.89%)
Additional %EBMIL 1 year after SADI-S, median (Q1–Q3)	35.88% (29.18–41.92%)

BMI – body mass index, %TWL – percentage total weight loss, % EBMIL – percentage excess body mass index loss, SADI-S – single anastomosis duodeno-ileal bypass after sleeve.



Changes in patients' median body mass index (BMI) during study

SADI-S is promising re-do surgery for insufficient weight loss or weight regain after laparoscopic sleeve gastrectomy with low postoperative morbidity.

Observed additional %TWL 1 year after SADI-S can be expected at a level of ~19%, and additional %EBMIL of ~36%, with significant improvement of obesity - related comorbidities.

Obes Surg. 2021 Jun;31(6):2691-2700. doi: 10.1007/s11695-021-05323-y. Epub 2021 Apr 9.

Efficacy and Drawbacks of Single-Anastomosis Duodeno-Ileal Bypass After Sleeve Gastrectomy in a Tertiary Referral Bariatric Center

Arnaud Liagre [1], Francesco Martini [1], Yves Anduze [1], Hubert Boudrie [1], Olivier Van Haverbeke [1], Stefano Valabrega [2], Radwan Kassir [3], Tarek Debs [4], Niccolò Petrucciani [5]

	12 months	24 months	36 months	48 months
Weight	88.5 ± 19.2 (54–145)	87.8 ± 20.7 (53–139)	95.8 ± 18.4 (62–134)	94.7 ± 13.3 (75–113)
BMI	32.2 ± 6.9 (22–46)	31.8 ± 6.7 (20–57)	34.5 ± 6.4 (26–55)	33.9 ± 3 (29–38)
%EWL	74.1 ± 22.1 (10–141)	76.9 ± 25.2 (18–160)	68.5 ± 22.7 (18–97)	78.2 ± 9.4 (68–95)
%TWL (overall)	36 ± 10.5 (4.5–58.9)	37.6 ± 12.3 (10.9–63.8)	35.6 ± 12.6 (7.5–57.8)	44.1 ± 8.2 (32.1–59.4)
Additional %TWL	22 ± 9.1 (2.4–48.1)	23.2 ± 12.9 (−9 to 53.4)	19.4 ± 12.7 (−4.6 to 38.7)	22.6 ± 9.6 (6.9–36.6)
N. of patients	81	64	31	10
Lost to follow-up	1	2	1	1

BMI, body mass index; *EWL*, excess weight loss; *TWL*, total weight loss; *N.*, number

Weight loss outcomes after single-anastomosis duodeno-ileal bypass

Obes Surg. 2021 Jun;31(6):2691-2700. doi: 10.1007/s11695-021-05323-y. Epub 2021 Apr 9.

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Complication/additional procedure	Number (percentage)
Cholecystectomy	6 (7.4%)
Urinary lithiasis	5 (6.2%)
GERD managed with medical treatment	15 (18.5%)
Invalidating reflux treated by conversion to RYGB	1 (1.2%)
Invalidating reflux treated by hiatal hernia repair and gastropexy	3 (3.7%)
Anastomotic stenosis	0
Re-SG for insufficient weight loss	2 (2.5%)
Malnutrition managed with medical treatment	2 (2.5%)
Laparoscopy for abdominal pain	1 (1.2%)
Conversion to RYGB for abdominal pain, diarrhea, and malnutrition	1 (1.2%)
Internal hernia	0
Cerebral hematoma	1 (1.2%)
Incisional hernia/umbilical hernia	1 (1.2%)
Gastric antrum resection for insufficient weight loss	1 (1.2%)
Duodenal ulcer	1 (1.2%)

SADI, single-anastomosis duodeno-ileal bypass; *SG*, sleeve gastrectomy; *RYGB*, Roux-en-Y gastric bypass

Long-term complications and additional procedures in patients with follow-up longer than 12 months after SADI (N = 81)

Obes Surg. 2021 Jun;31(6):2691-2700. doi: 10.1007/s11695-021-05323-y. Epub 2021 Apr 9.

Efficacy and Drawbacks of Single-Anastomosis Duodeno-Ileal Bypass After Sleeve Gastrectomy in a Tertiary Referral Bariatric Center

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SADI after SG provides effective weight loss results in the short-term, even if in the present series the postoperative complication rate was non-negligible.

Further trials are needed to establish the more advantageous revisional bariatric procedure after failed SG.

Postoperative morbi-mortality	*N* (%)	Type of complication and treatment
Sepsis	14 (13.2%)	
Abdominal abscess ± leak	9 (8.4%)	Anastomotic leak with a 6-cm abscess, sudden death at POD 5
		Abdominal pain and fever at POD 20 with sudden death at home
		Re-laparoscopy at POD 6, with placement of a Kehr tube into the orifice of the leak. Percutaneous drainage of a hepatic abscess, drainage of a pelvic abscess
		Re-laparoscopy at POD 2, with placement of a Kehr tube into the orifice of the leak
		Re-laparoscopy at POD 2 with washing and drainage. Placement of an endoscopic Kehr tube into the orifice of the leak for chronic duodeno-cutaneous fistula
		Leak and torsion of the ileal anastomoti at POD 8. Laparotomy and conversion to OAGB
		Re-laparoscopy at POD 6, with placement of a Kehr tube into the orifice of the leak
		Diagnosis at POD 20 of a small leak by CT scan and choledocoduodenal fistula at endoscopy, treated by antibiotics
		Posterior leak at POD 10 with gastroduodenal artery erosion treated by laparoscopy, endoscopy, and embolization. Complicated by anastomotic stenosis
Perianastomotic cellulitis without abscess	4 (3.7%)	Antibiotic treatment
Bowel iatrogenic perforation	1 (0.9%)	Re-operation
Anastomotic bleeding	1 (0.9%)	Erosion of the gastroduodenal artery due to an anastomotic leak
Anastomotic stenosis	1 (.09%)	Spontaneous resolution
Total morbidity	16 (15.1%)	

POD, postoperative day; *OAGB*, one-anastomosis gastric bypass; *CT*, computed tomography

Postoperative complications after single-anastomosis duodeno-ileal bypass

Obes Surg. 2018; 28(12): 3834–3842. PMCID: PMC6223754
Published online 2018 Jul 31. doi: 10.1007/s11695-018-3429-z PMID: 30066245

Failed Sleeve Gastrectomy: Single Anastomosis Duodenoileal Bypass or Roux-en-Y Gastric Bypass? A Multicenter Cohort Study

Phillip J. Dijkhorst,[1,2] Abel B. Boerboom,[2] Ignace M. C. Janssen,[1] Dingeman J. Swank,[3] René M. J. Wiezer,[4] Eric J. Hazebroek,[2] Frits J. Berends,[2] and Edo O. Aarts[2]

	%TBWL at 3 months	%TBWL at 6 months	%TBWL at 12 months	%TBWL at 24 months
SADI (n = 66)	11.3% (± 4.1)	16.5% (± 5.8)	21.5% (± 8.1)	26.4% (± 10.4)
RYGB (n = 74)	5.9% (± 5.3)	7.8% (± 6.8)	8.9% (± 8.7)	6.9% (± 11.3)
P value	< .001	< .001	< .001	< .001

(SADI single anastomosis duodenoileal bypass, RYGB Roux-en-Y gastric bypass, n is given in brackets)

Obes Surg. 2021; 31(11): 4708–4716.
Published online 2021 Aug 16. doi: 10.1007/s11695-021-05609-1
PMCID: PMC8490218
PMID: 34398380

Single Anastomosis Duodenoileal Bypass or Roux-en-Y Gastric Bypass After Failed Sleeve Gastrectomy: Medium-Term Outcomes

Phillip J. Dijkhorst,[1] May Al Nawas,[2] Laura Heusschen,[3] Eric J. Hazebroek,[3] Dingeman J. Swank,[4] René M.J. Wiezer,[2] and Edo O. Aarts[5]

METHODS

141 sleeve gastrectomy patients

66 SADI-S

78 RYGB

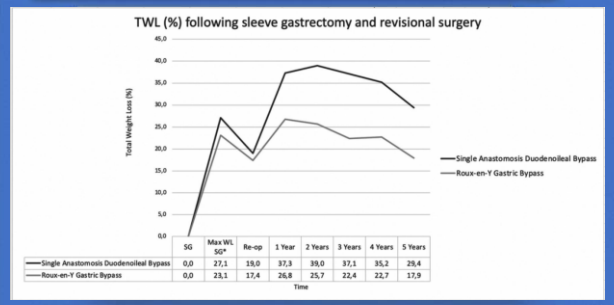
Insufficient weight loss 100%

Insufficient weight loss 60%

Functional problem with SG 40%

RESULTS

SADI-S resulted in more than double the amount of weight loss



	SG	Max WL SG*	Re-op	1 Year	2 Years	3 Years	4 Years	5 Years
Single Anastomosis Duodenoileal Bypass	0,0	27,1	19,0	37,3	39,0	37,1	35,2	29,4
Roux-en-Y Gastric Bypass	0,0	23,1	17,4	26,8	25,7	22,4	22,7	17,9

No difference in:

- Quality of life
- Complications
- Micronutrient deficiencies

CONCLUSIONS

- Conversion of SG to SADI-S leads to significantly more total weight loss compared to RYGB surgery with no difference in quality of life scores, complication rates or micronutrient deficiencies
- When GERD in sleeve patients has to be resolved, RYGB provides adequate outcomes.

J Clin Med. 2023 Sep; 12(18): 5975.
Published online 2023 Sep 15. doi: 10.3390/jcm12185975
PMCID: PMC10531699
PMID: 37762916

Revisional Procedures after Sleeve Gastrectomy for Weight Recurrence or Inadequate Weight Loss: An Analysis of the MBSAQIP Database

Karl Hage, Conceptualization, Formal analysis, Data curation, Writing – original draft,[1] Juan S. Barajas-Gamboa, Data curation, Writing – original draft,[2] Gustavo Romero-Velez, Data curation, Writing – original draft,[3] Matthew Allemang, Validation, Writing – review & editing, Supervision,[3] Salvador Navarrete, Validation, Writing – review & editing, Supervision,[3] Ricard Corcelles, Validation, Writing – review & editing, Supervision,[3] John Rodriguez, Validation, Writing – review & editing, Supervision,[2] Omar M. Ghanem, Validation, Writing – review & editing, Supervision,[1] Matthew Kroh, Validation, Writing – review & editing, Supervision,[3] and Jerry T. Dang, Conceptualization, Software, Formal analysis, Investigation, Data curation, Writing – original draft, Writing – review & editing[3,*]

n (%)	RYGB n = 5734	SADI n = 642	BPD-DS n = 1012	*p*-Value
Operative time, minutes mean ± SD	141.0 (66.1)	149.1 (67.8)	148.8 (63.0)	<0.001
Robotic-assisted	1233 (21.5)	194 (30.2)	353 (34.9)	<0.001
Concurrent paraesophageal hernia repair	1389 (24.2)	98 (15.3)	145 (14.3)	<0.001
Concurrent lysis of adhesions	118 (2.1)	36 (5.6)	8 (0.8)	<0.001
Length of stay, days				
median (interquartile range)	1 (1)	1 (1)	1 (1)	0.008
Anastomotic leak	31 (0.5)	10 (1.6)	13 (1.3)	0.001
Postoperative bleeding	91 (1.6)	6 (0.9)	10 (1.0)	0.177
Reoperation	139 (2.4)	17 (2.7)	27 (2.7)	0.862
Non-operative intervention	112 (2.0)	9 (1.4)	18 (1.8)	0.601
Readmission	365 (6.4)	32 (5.0)	59 (5.8)	0.343
Cardiac events	5 (0.1)	1 (0.2)	0 (0.0)	0.525

Comparison of serious complications and mortality rates between these procedures within 30 days.

n (%)	RYGB n = 5734	SADI n = 642	BPD-DS n = 1012	*p*-Value
Pneumonia	23 (0.4)	1 (0.2)	3 (0.3)	0.575
Unplanned intubation	8 (0.1)	0 (0.0)	2 (0.2)	0.558
Acute kidney injury	6 (0.1)	0 (0.0)	0 (0.0)	0.421
Venous thromboembolism	18 (0.3)	2 (0.3)	4 (0.4)	0.914
Deep surgical site infection	56 (1.0)	10 (1.6)	18 (1.8)	0.049
Wound disruption	5 (0.1)	0 (0.0)	1 (0.1)	0.746
Sepsis	21 (0.4)	0 (0.0)	5 (0.5)	0.236
Cerebrovascular accident	0 (0.0)	1 (0.2)	0 (0.0)	0.005
Serious complications	337 (5.9)	32 (5.0)	61 (6.0)	0.628
Death	6 (0.1)	0 (0.0)	1 (0.1)	0.715

RYGB, conversion from sleeve gastrectomy to Roux-en-Y gastric bypass; SADI, conversion from sleeve gastrectomy to single-anastomosis duodeno-ileal bypass; BPD-DS, conversion from sleeve gastrectomy to biliopancreatic diversion with duodenal switch.

The study indicated a similar safety profile for revisional RYGB, SADI, and BPD-DS, with comparable 30-day complications and mortality rates.

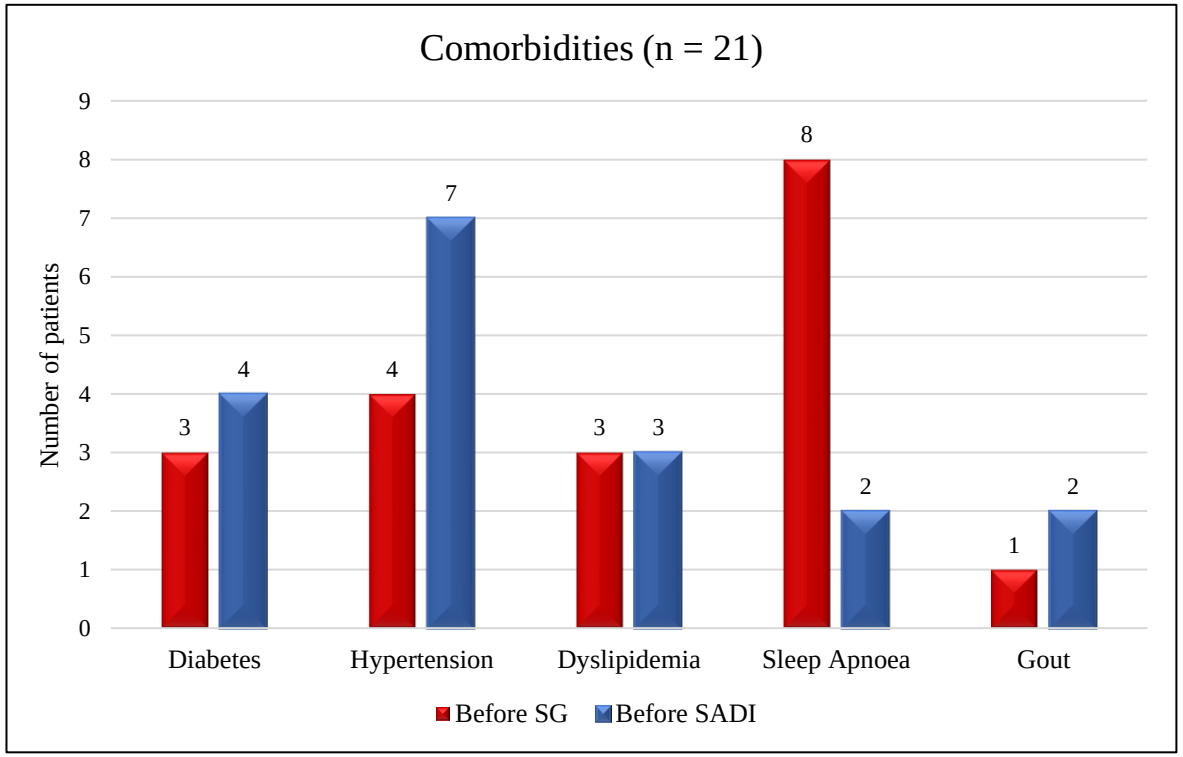
However, SADI and BPD-DS patients had longer operative time and higher leak rates.

Demographic data

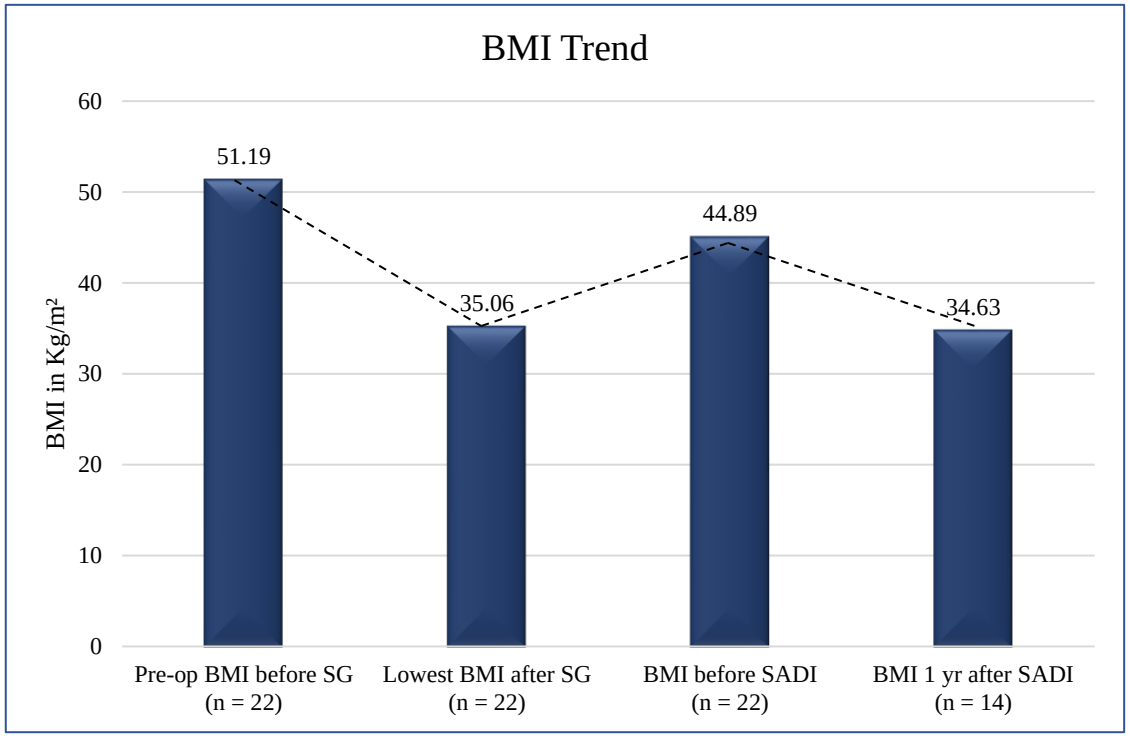
Patient population → 55% / 45% → 81 Pts

Age → 44.06 ± 10.40 years

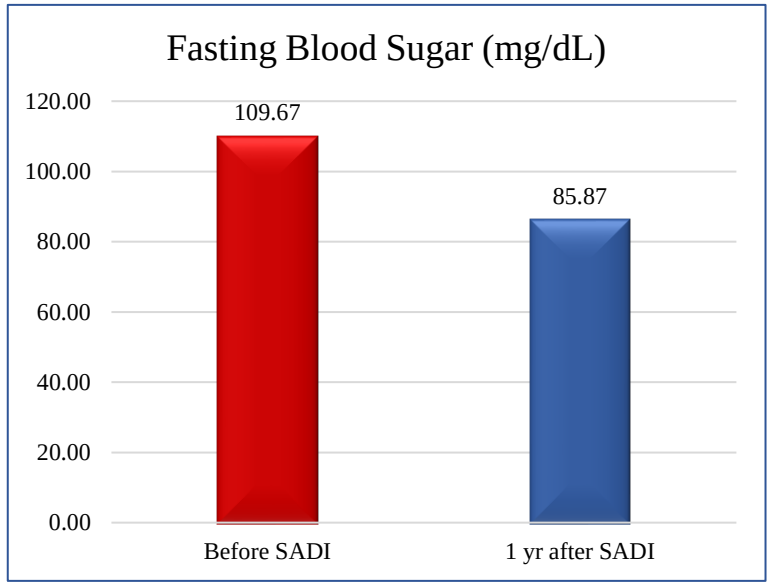
Time to Revision → 7.91 ± 3.8 years

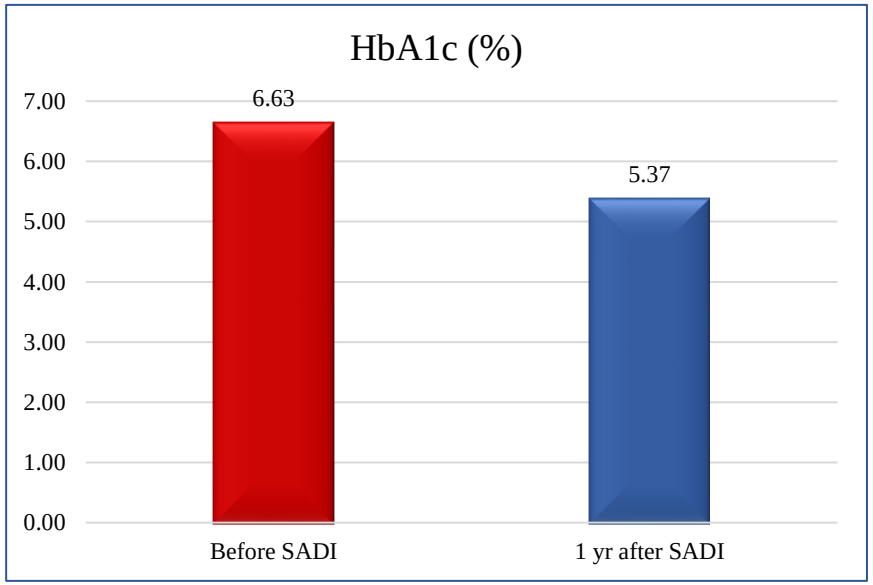



Weight Trend
Weight in Kg
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
146.17
100.17
128.28
94.37
Pre-op weight before SG (n = 22)
Lowest weight after SG (n = 22)
Weight before SADI (n = 22)
Weight 1yr post revision (n = 14)


BMI Trend
BMI in Kg/m²
60
50
40
30
20
10
0
51.19
35.06
44.89
34.63
Pre-op BMI before SG (n = 22)
Lowest BMI after SG (n = 22)
BMI before SADI (n = 22)
BMI 1 yr after SADI (n = 14)

In patients with T2DM before SADI



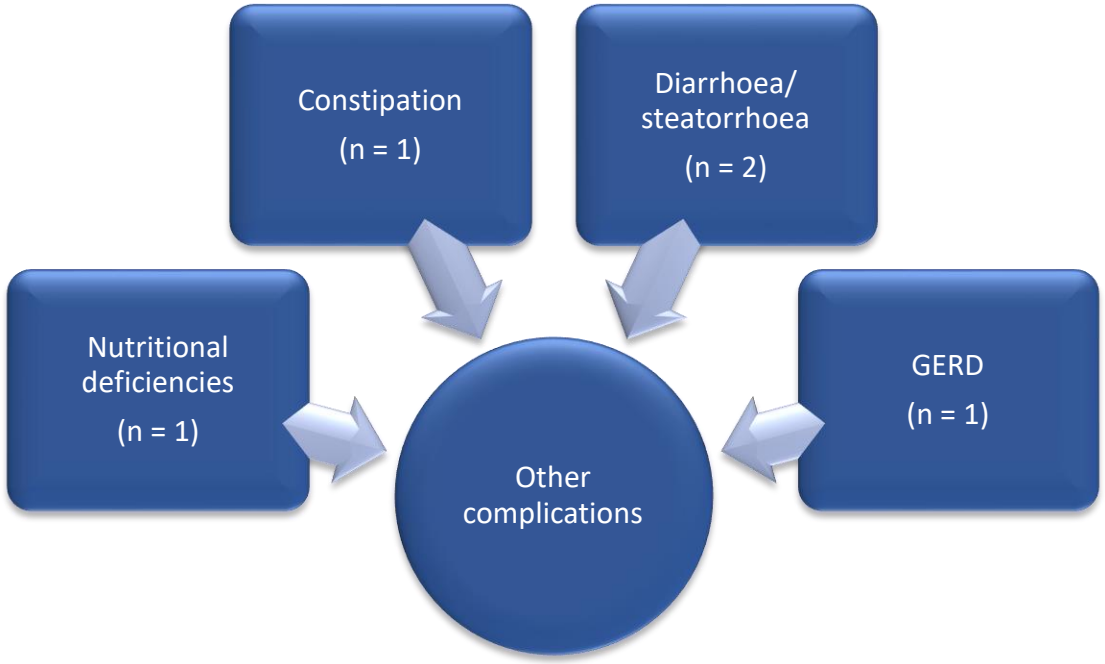


Early Post operative complications

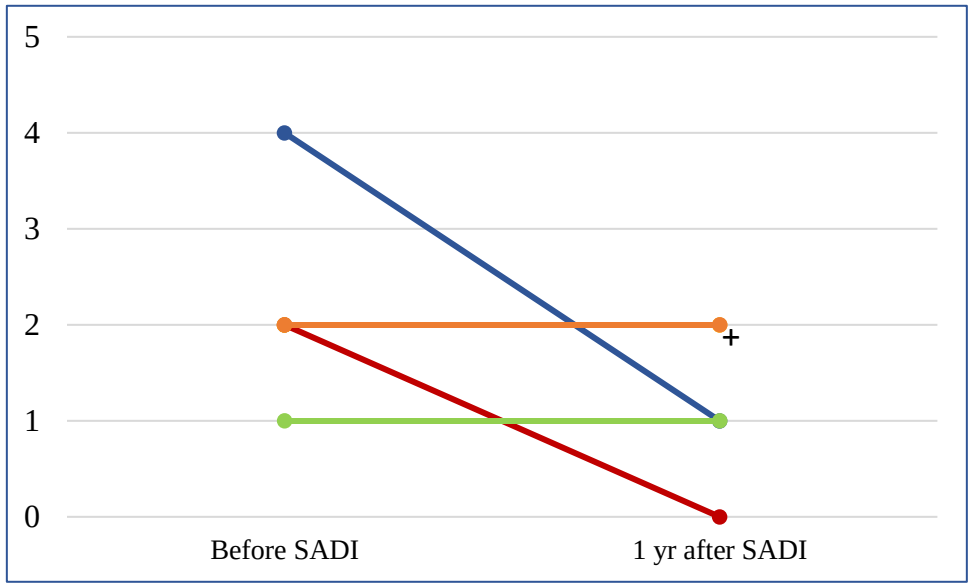
- None

Mortality

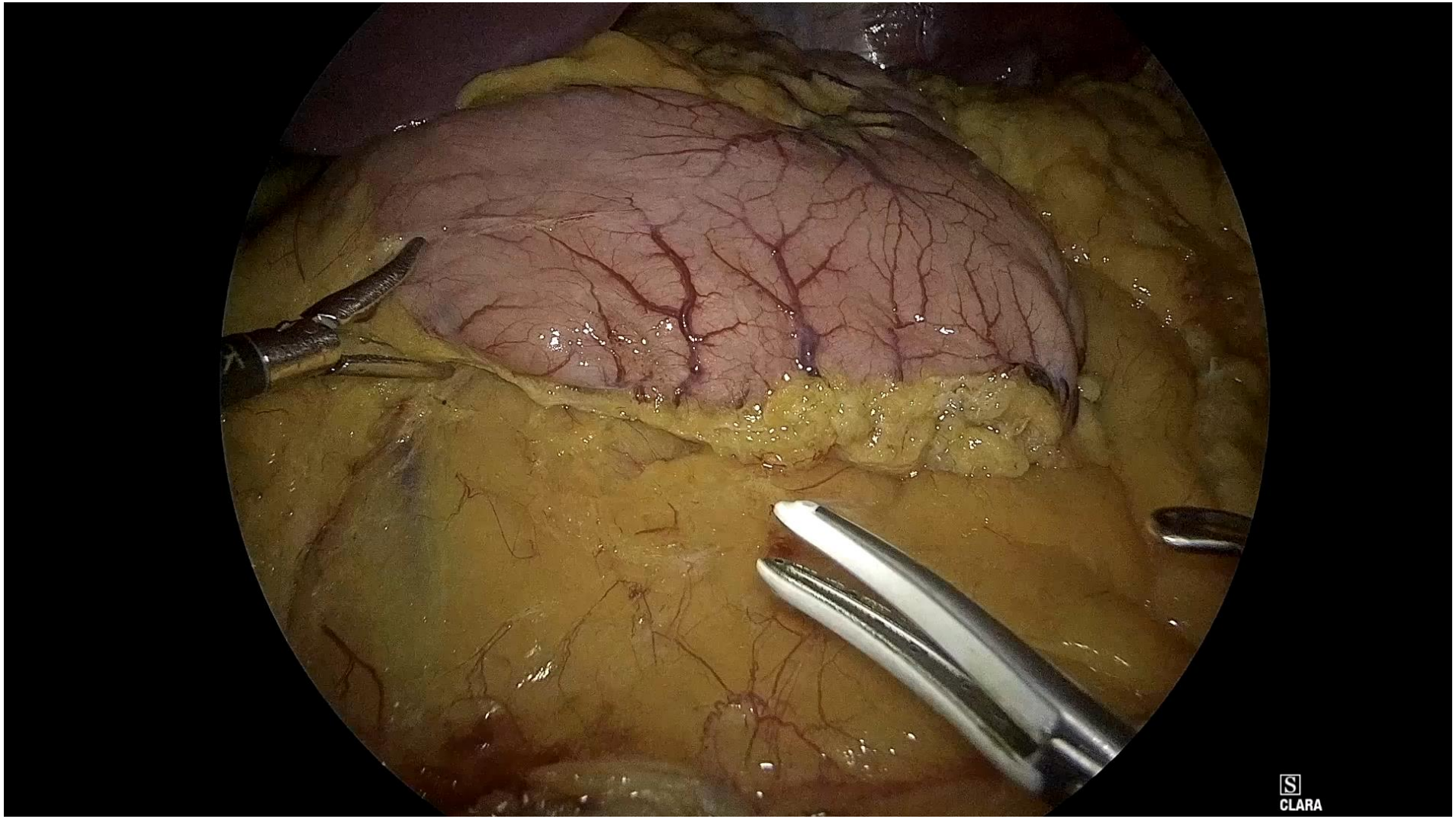
- 1 Due to Covid-19



In patients with HTN before SADI



In patients with Dyslipidemia before SADI


CLARA

We Never say Goodbye in India
We say Until We Meet Again