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9-12 September 2025 | Santiago, Chile

Ring-Augmented versus Non-Ring Augmented Sleeve Gastrectomy in Patients with BMI > 50 kg/m²: A 3-Year Follow-up of a Randomized Controlled Trial

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Disclosure

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Nothing to disclose

Introduction

The Problem with Standard Sleeve Gastrectomy

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- **Despite widespread adoption, SG is prone to late recurrent weight gain**
- **27.8% experience RWG at ≥7 years (meta-analysis)**
- **19.9% require revision surgery**

- **13.1% due to RWG**
- **2.9% due to GERD**

- **Mechanisms: pouch dilation and neuro-hormonal adaptations → diminished restriction**

Clapp B, Wynn M, Martyn C, Foster C, O'Dell M, Tyroch A: **Long term (7 or more years) outcomes of the sleeve gastrectomy: a meta-analysis**. *Surg Obes Relat Dis* 2018, **14**(6):741-747 **doi:** 10.1016/j.soard.2018.02.027.

BMI > 50 kg/m^2- A Special Challenge

Peak weight loss after SG:

30-35% TWL at 18-24 months

Long-term outcomes after SG:

22-25% TWL at 5 years
Looks "adequate" but often insufficient for sustained remission

Catheline JM, Fysekidis M, Dbouk R, Boschetto A, Bihan H, Reach G, Cohen R: **Weight loss after sleeve gastrectomy in super superobesity**. *Journal of obesity* 2012, **2012**:959260 **doi:** 10.1155/2012/959260.
Arapis K, Macrina N, Kadouch D, Ribeiro Parenti L, Marmuse JP, Hansel B: **Outcomes of Roux-en-Y gastric bypass versus sleeve gastrectomy in super-super-obese patients (BMI ≥60 kg/m(2)): 6-year follow-up at a single university**. *Surg Obes Relat Dis* 2019, **15**(1):23-33 **doi:** 10.1016/j.soard.2018.09.487.

Evidence in BMI > 50 kg/m² with LSG

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Lemanu et al. Greater absolute WL in super-obese, but less durable relative outcomes

Samuel et al. Median %EWL 39.2% in super-obese vs 52.6% in BMI 40–49

Hoyuela et al. Poorer long-term results, higher revision rates in super-obese

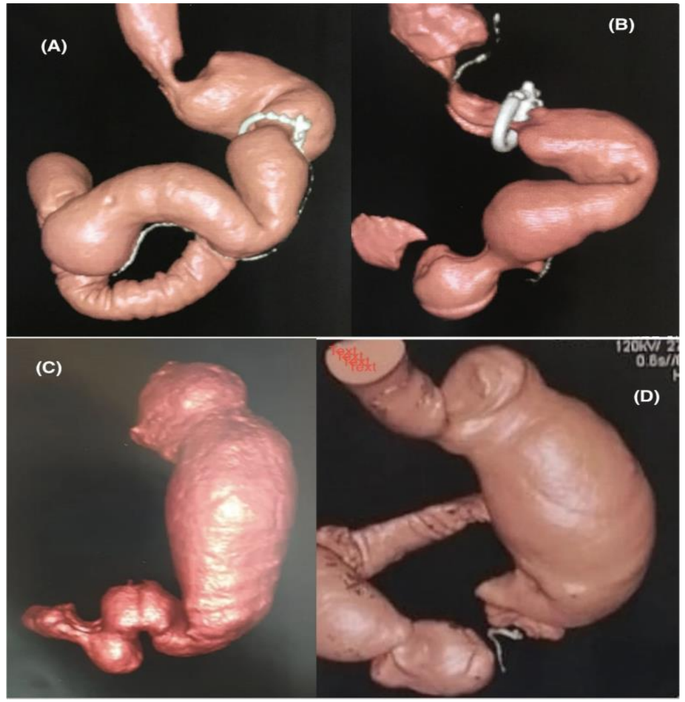
Ece et al. %EWL lowest in BMI ≥ 60

Khan et al. Short-term %TWL similar, but %EWL consistently lower in BMI ≥ 50

Lemanu DP, Srinivasa S, Singh PP, MacCormick AD, Ulmer S, Morrow J, Hill AG, Babor R, Rahman H: Single-stage laparoscopic sleeve gastrectomy: safety and efficacy in the super-obese. *J Surg Res* 2012, 177(1):49-54 doi: 10.1016/j.jss.2012.01.011.
Ece I, Yilmaz H, Alptekin H, Yormaz S, Colak B, Yilmaz F, Sahin M: Comparative Effectiveness of Laparoscopic Sleeve Gastrectomy on Morbidly Obese, Super-Obese, and Super-Super Obese Patients for the Treatment of Morbid Obesity. *Obes Surg* 2018, 28(6):1484-1491 doi: 10.1007/s11695-017-3053-3.
Samuel N, Jalal Q, Gupta A, Mazari F, Vasas P, Balachandra S: Mid-term bariatric surgery outcomes for obese patients: does weight matter? *Ann R Coll Surg Engl* 2020, 102(1):54-61 doi: 10.1308/rcsann.2019.0100.
Khan IA, K AA, Asghar M, Abbas K: Comparative Effectiveness of Laparoscopic Sleeve Gastrectomy in Morbidly Obese and Super Obese Patients. *Cureus* 2021, 13(12):e20767 doi: 10.7759/cureus.20767.
Hoyuela C: Five-year outcomes of laparoscopic sleeve gastrectomy as a primary procedure for morbid obesity: A prospective study. *World J Gastrointest Surg* 2017, 9(4):109-117 doi: 10.4240/wjgs.v9.i4.109.

Ring-Augmented Sleeve Gastrectomy

- Non-adjustable ring placed around proximal sleeve **3-5cm from GE junction**
- Maintains restriction & prevents dilation
- Hypothesis: **improve long-term durability**
- **Key difference** from adjustable gastric bands: Fixed, non-adjustable silicone ring



Hany M, Berends F, Aarts E, Fink J, G. Boerma E-J, Torensma B: Technical Considerations of Ring-Augmented Laparoscopic Sleeve Gastrectomy: A Step-by-step Guide for Ring Placement by Various Experts. *Obesity Surgery* 2025, 35(2):655-657 doi: 10.1007/s11695-025-07674-2.

Current Evidence Gap

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Existing Evidence:

- Fink et al. RCT: +9% EWL at 5 years; 20% vs 11.9% conversion rate
- Chaouch meta-analysis: +8-10% EWL at 1-3 years

The Gap:

- Mixed BMI populations
- Limited data in Class IV, V obesity specifically
- Need for a dedicated RCT in the BMI > 50 kg/m^2 cohort

Fink JM, Reutebuch M, Seifert G, Laessle C, Fichtner-Feigl S, Marjanovic G, Fink M: **Banded Versus Non-banded Sleeve Gastrectomy: 5-Year Results of a 3-Year Randomized Controlled Trial**. *Obesity Surgery* 2024, **34**(2):310-317 **doi:** 10.1007/s11695-023-06982-9.

Chaouch MA, Yang W, Gouader A, Krimi B, Carneiro da Costa A, Pourcher G, Oweira H: **Banded versus non-banded sleeve gastrectomy: A systematic review and meta-analysis**. *Medicine (Baltimore)* 2023, **102**(15):e32982 **doi:** 10.1097/md.0000000000032982.

Trial Design & Methods

Clinicaltrial.gov: **NCT07100327**

- Single Center, Single-blinded RCT
- Intervention: Ra-SG vs standard SG
- Follow-up: 36 months
- Primary endpoint: %TWL at 36 months
- Secondary endpoints: RWG, gastric pouch volumetry, AMPs relapse, complications, endoscopic findings at 3 years, laboratory parameters, and patient-reported outcomes (SF-36, Suter).

Inclusion and Exclusion Criteria

- **Inclusion Criteria:**

1. BMI > 50 kg/m², age: 18-60 years
2. Provided informed consent to take part in the trial.

- **Exclusion Criteria:**

1. Active/previous GERD or hiatal hernia
2. Prior bariatric surgery
3. Refusal of ring placement
4. Planned pregnancy during follow-up.
5. Active malignancy, uncontrolled psychiatric disorders, substance abuse

Primary Outcome Definition

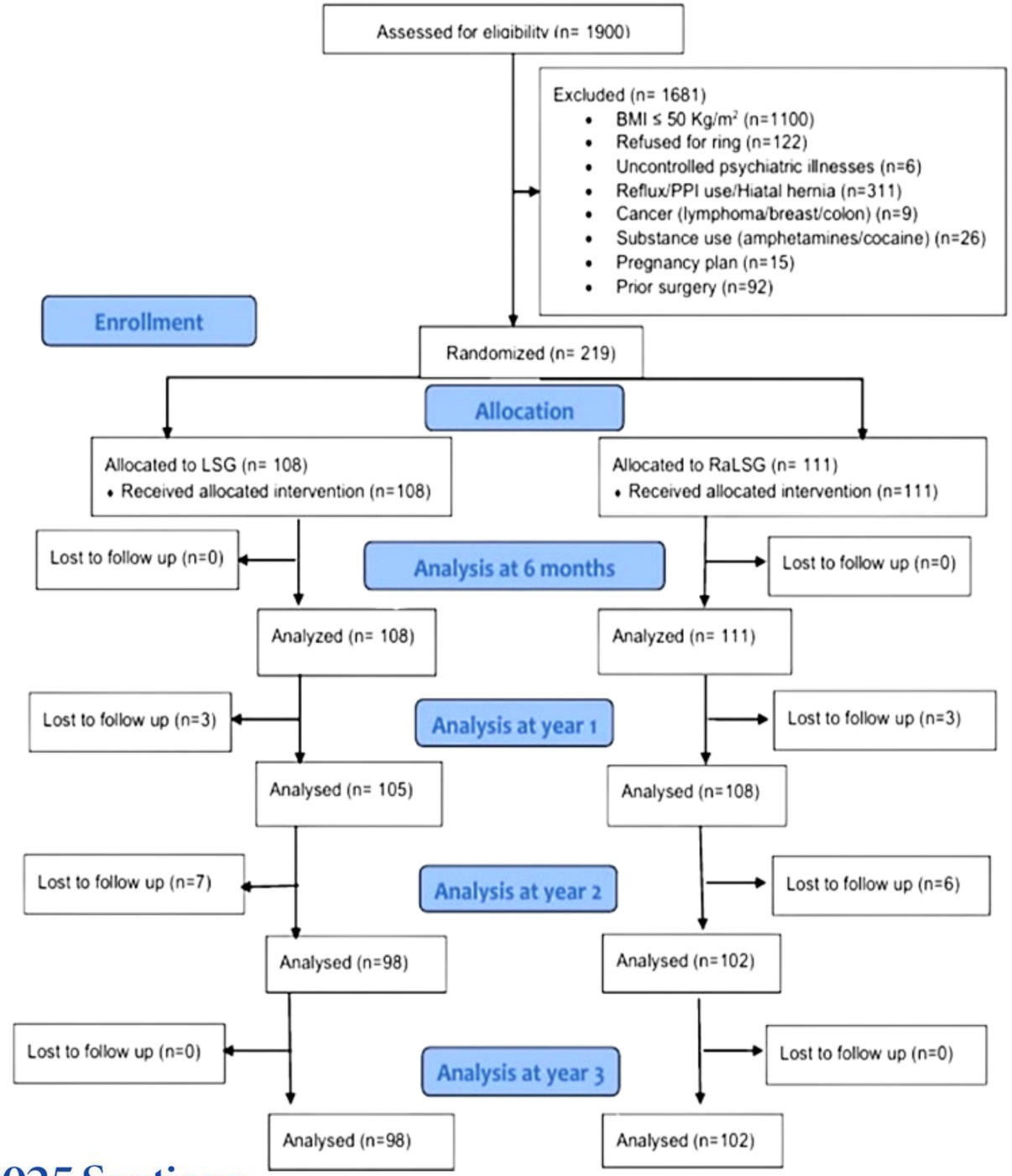
Recurrent Weight Gain (RWG) Definition:
According to IFSO Delphi consensus

- Gaining >30% of initial surgical weight loss from nadir

OR

-Recurrence/worsening of obesity-related complication that was an indication for surgery

Salminen P, Kow L, Aminian A, Kaplan LM, Nimeri A, Prager G, Behrens E, White KP, Shikora S: **IFSO Consensus on Definitions and Clinical Practice Guidelines for Obesity Management-an International Delphi Study**. *Obes Surg* 2024, **34**(1):30-42 **doi:** 10.1007/s11695-023-06913-8.



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Randomised n=219

Completed n=200 (96%)

91% completed 3-year follow-up – One patient at year 2 with ring removal.

Recruitment between Jan 2021 and Jan 2022

The mean **age: 37.7 ± 10.2 years**, with no significant difference between groups (p=0.928).

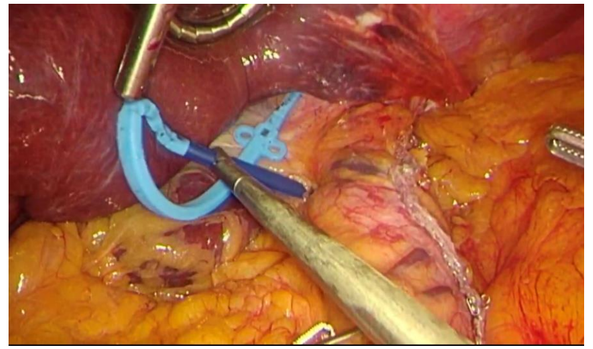
Females constituted 66.7% (n=146) of participants, without significant differences between groups (p=0.474).

The mean BMI was 53.8 ± 2.9 kg/m² (p=0.847)

No differences in AMPs.

Some differences in the lab values.

Surgical Technique



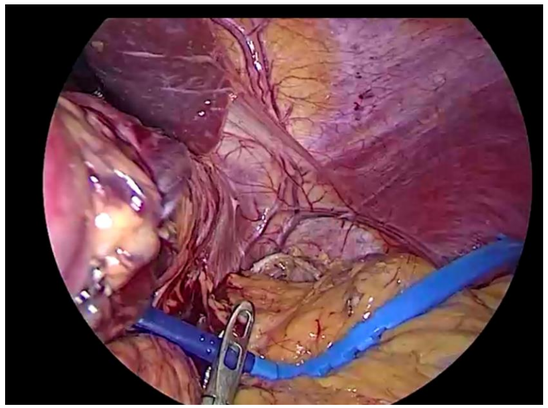
Techniques of Placement:

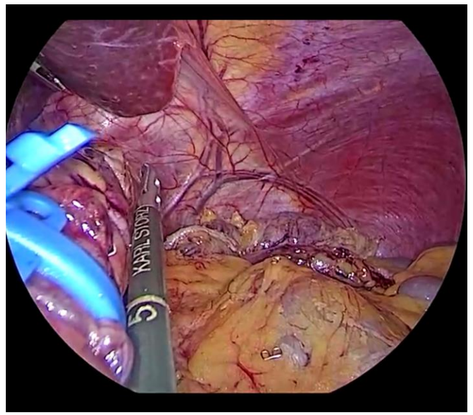
Perigastric tunnel – created close to the gastric wall.

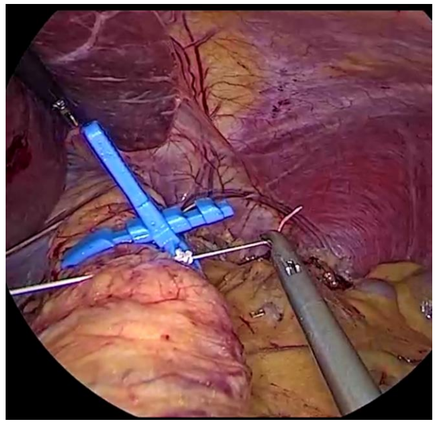
Pars flaccida approach – through the gastro-hepatic ligament

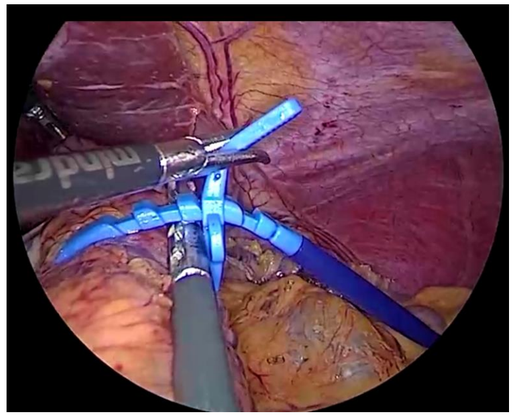
Avoid Excess Tightness

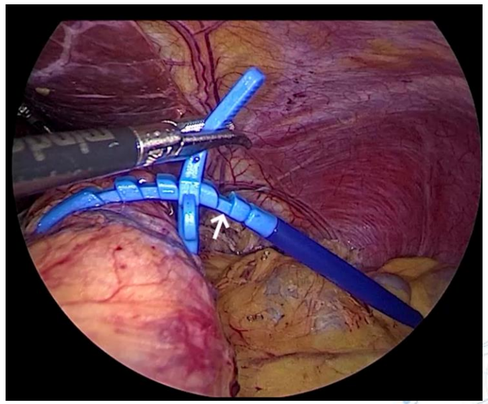
Instrument Passage Check











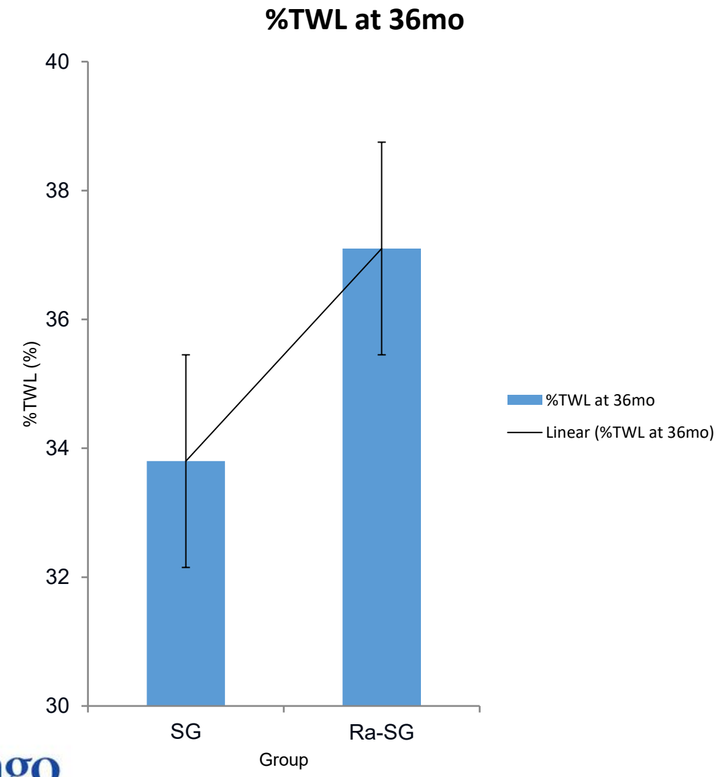
Primary Outcome - %TWL at 36 Months

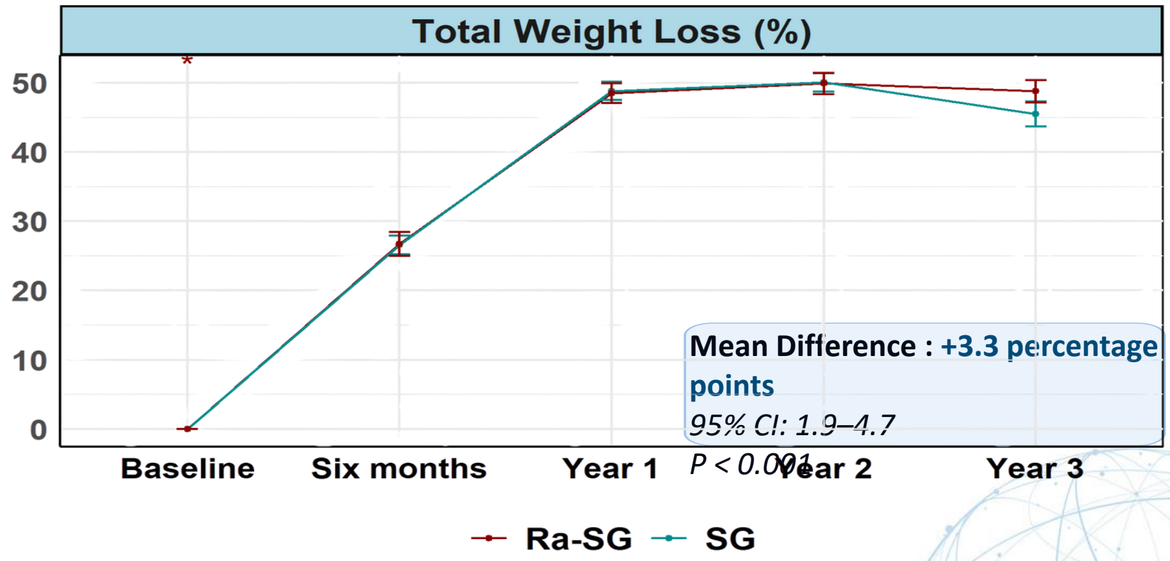
Ra-SG: 37.1 ± 5.4% TWL

SG: 33.8 ± 4.6% TWL

Mean difference: +3.3 percentage points (95% CI: 1.9-4.7)

p < 0.001





Secondary endpoint: Pouch Volume Analysis

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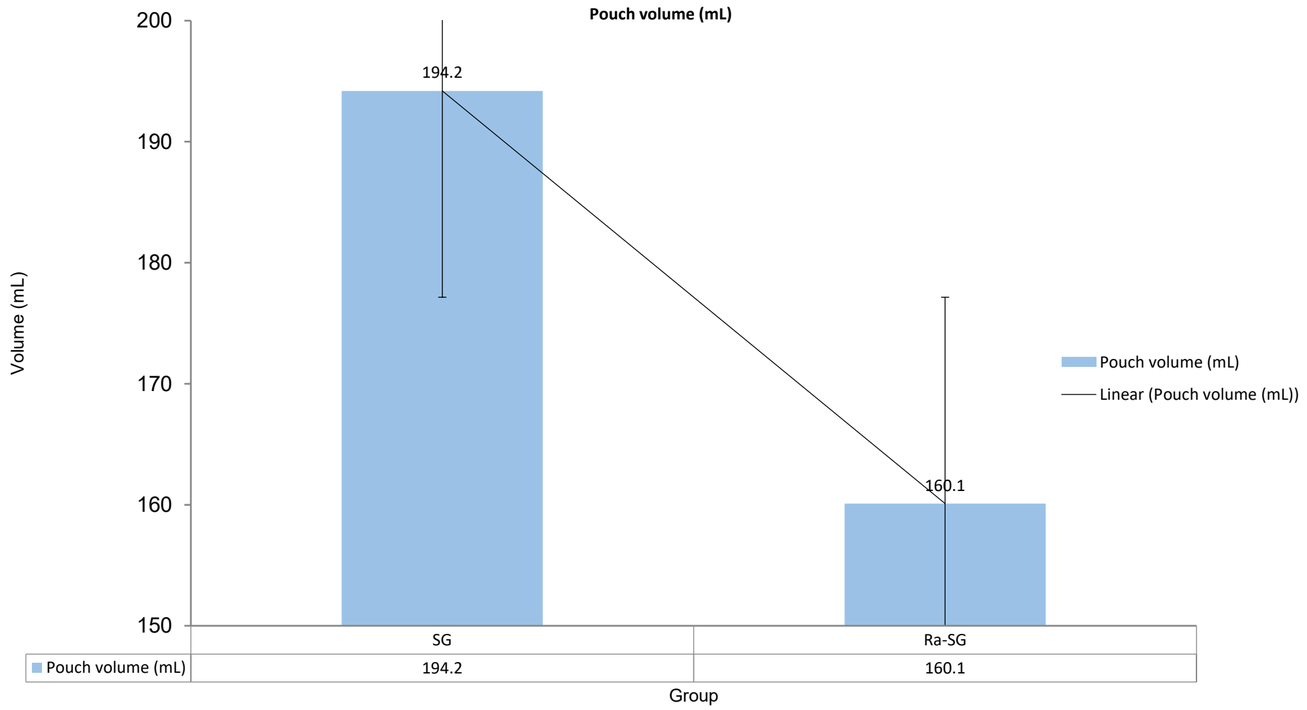
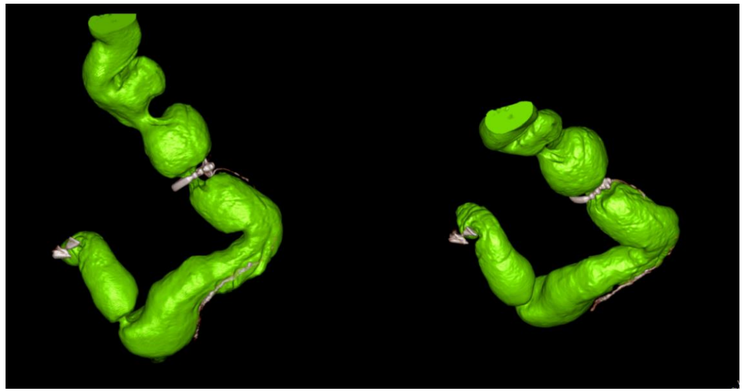
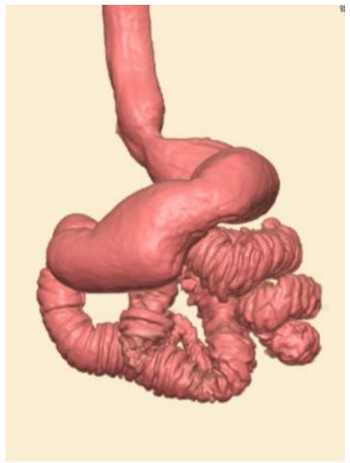
CT volumetry at 36 months showed:

Ra-SG: **160.1 ± 8.9 mL**
SG: **194.2 ± 10.3 mL**
$p < 0.001$







Secondary endpoint:

Recurrent Weight Gain

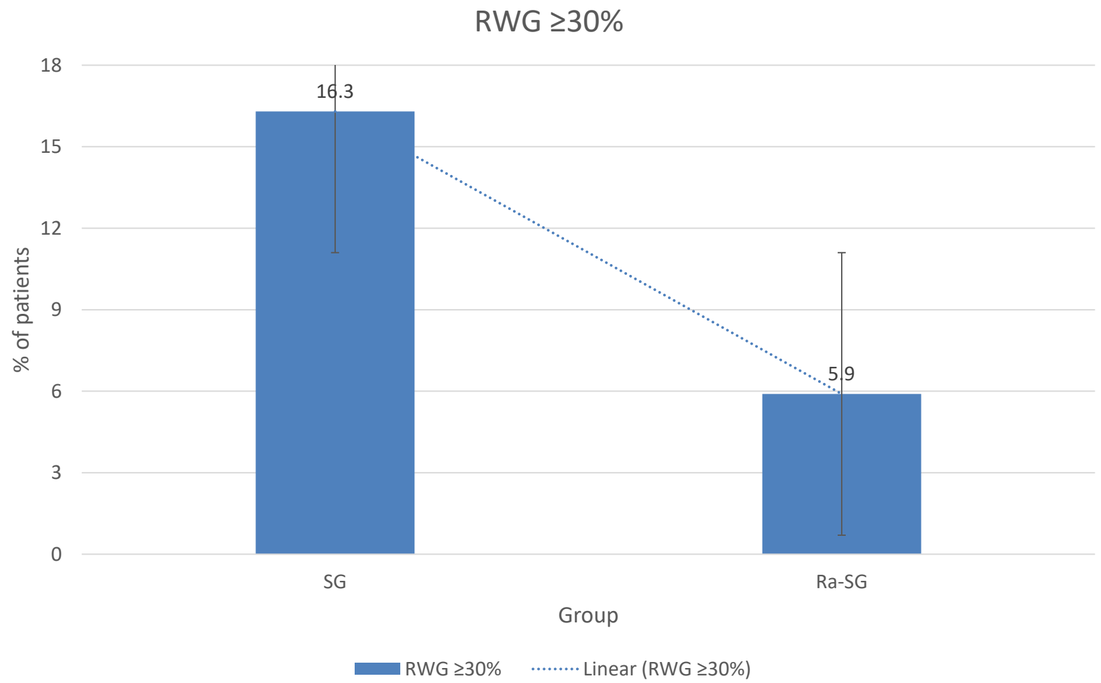
Clinically significant RWG (≥30%):

SG: 16.3% (16 patients)

Ra-SG: 5.9% (6 patients)

Absolute risk difference: -10.4% (95% CI: -19.6 to -1.2)

p = 0.033



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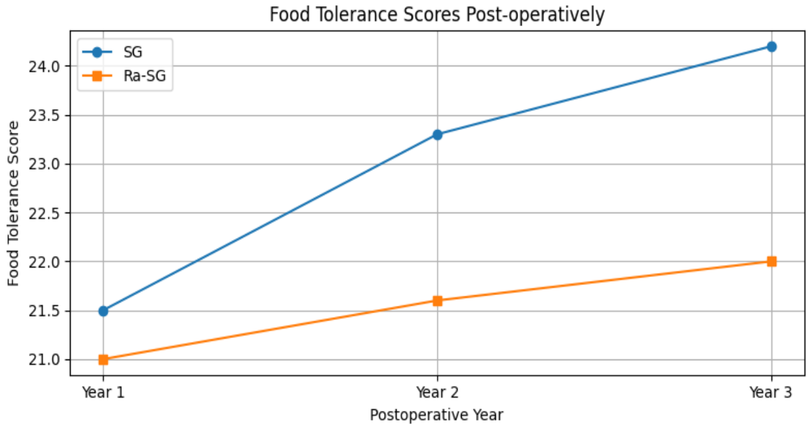
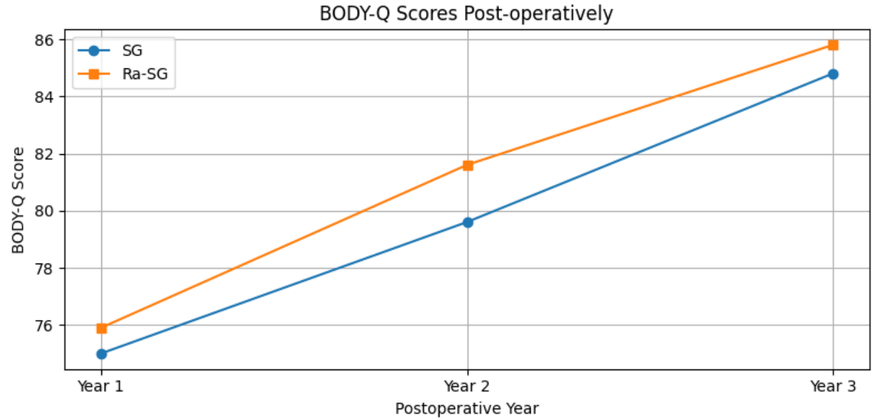
Secondary endpoint: Patient-Reported Outcomes

Food tolerance

- Consistently better in SG group (all time points, $p < 0.05$)
- Expected trade-off for improved weight control



- Both groups: significant improvements in SF-36. No significant differences between groups at 36 months



Secondary endpoint: Safety Profile

Similar operative times (41.2 vs 41.8 minutes)
Perioperative Complications:
Comparable early complications (leak 1 SG treated with stent; bleeding, 1 in each arm, blood transfusion)

The proportion of patients experiencing relapse of any obesity-related disease was significantly higher in SG (15.3%) than in Ra-SG (2.9%, p = 0.003), especially dyslipidemia and hypertension.

No increase in GERD at 3 years (17.3% vs 19.6%). Esophagitis grade B and C in 2% vs 1%

Ring-Specific Issues:
Ring removal: 2 patients (1.8%). No erosion/slippage.
Most food intolerances were managed conservatively.

Revision rate: At year 3, conversional RYGB was performed in **7.2%** (8) of SG versus **2.0%** of Ra-SG (2).

Comparison with Literature

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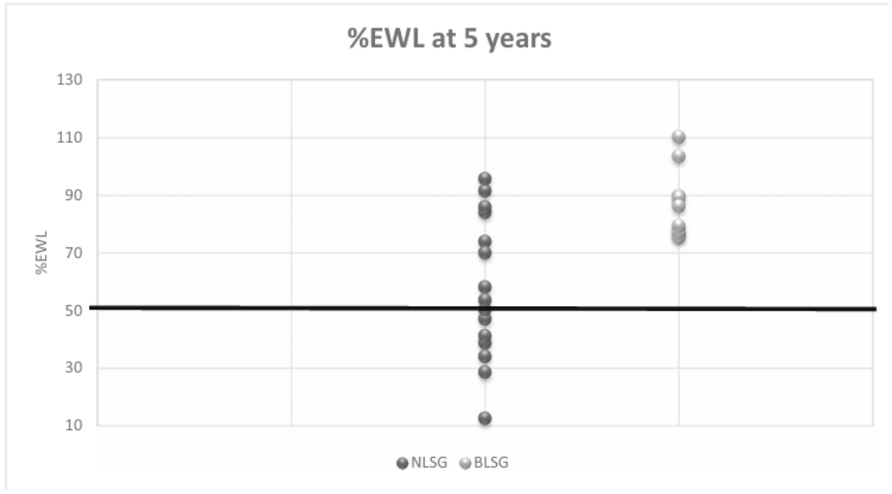
Our findings align with prior evidence:

- Lemmens et al.: 78.3% vs 61.6% EWL;

0% vs 35.2% failure rate

- Similar RWG reduction patterns across studies



Obesity Surgery (2023) 33:406–417
https://doi.org/10.1007/s11695-022-06404-2

ORIGINAL CONTRIBUTIONS

Comparison of Sleeve Volume Between Banded and Non-banded Sleeve Gastrectomy: Midterm Effect on Weight and Food Tolerance—a Retrospective Study

Mohamed Hany[1,2] · Bart Torensma[3] · Ahmed Zidan[1] · Ann Samy Shafiq Agayby[1] · Mohamed Ibrahim[1] · Mohamed El Shafie[4] · Iman El Sayed[5]

Obesity Surgery (2024) 34:310–317
https://doi.org/10.1007/s11695-023-06982-9

ORIGINAL CONTRIBUTIONS

Banded Versus Non-banded Sleeve Gastrectomy: 5-Year Results of a 3-Year Randomized Controlled Trial

Jodok M. Fink[1] · Marina Reutebuch[1] · Gabriel Seifert[1] · Claudia Laessle[1] · Stefan Fichtner-Feigl[1] · Goran Marjanovic[1] · Mira Fink[1]

GERD and Ring-Related Complications

- GERD outcomes: no significant difference at 5 years (≈27% both groups, Fink RCT)
- Chaouch meta-analysis: no increased risk of de novo GERD (OR 0.65, p=0.20)
- Main added morbidity: occasional dysphagia, mostly diet-managed; rare ring removal.

- Adjustable gastric band → reoperation >30% (slippage, erosion, migration)
- Non-adjustable Ra-SG rings → lower complication rates (3–11%)
- Overall, Ra-SG may reduce reoperations compared with SG, where conversion for RWG can approach 30%

Mechanisms of Action

How the ring works:

- Fixed outlet 4-5cm below GE junction
- Prevents reservoir expansion
- Slows gastric emptying
- Activates "ileal brake" → prolonged satiety
- Maintains restriction long-term

Clinical Implications

Ra-SG as an "anti-regain" strategy:

- Consider for patients at high risk of RWG
- Particularly valuable in BMI > 50 kg/m^2
- Preoperative counseling is essential: balance weight durability vs food tolerance
- Most patients adapt to dietary restrictions

Key Advancement

- First dedicated RCT in patients with BMI > 50 kg/m^2
- Confirms benefits extend to most patients with severe obesity.
- Evaluation of patients using endoscopy and studying the pouch volume.

Study Limitations

- Single-center design - may limit generalizability
- Baseline imbalances in some laboratory parameters
- 36-month follow-up - may miss late complications
- BMI range: 50.2-59.9 kg/m^2
- Adequate power for weight outcomes, but not all secondary endpoints

Future Research Directions

- Multi-center RCTs with extended follow-up (≥5 years)
- IFSO registry integration for population-level data
- Cost-effectiveness analyses
- Refined patient selection criteria

Current Recommendation:

- Consider Ra-SG for high-risk RWG patients, especially those with a BMI > 50kg/m^2

Conclusions

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- Ra-SG provides superior midterm weight loss in patients with a BMI > 50 kg/m^2
- Significant reduction in clinically meaningful recurrent weight gain
- Comparable safety profile to standard SG
- Trade-off: reduced food tolerance for better weight control

Bottom Line:
For selected patients with severe obesity at high risk of RWG, Ra-SG offers an effective anti-regain strategy that should be considered in our armamentarium.

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Thank You

Registration

Clinicaltrial.gov: **NCT07100327**

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